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A breath of fresh air

While so much attention in the media has focused on the provision of ventilators, in fact they are not the only breathing support devices that are required to support patients who are suffering from the effects of COVID-19.

Increasingly, continuous Positive Airway Pressure (cPAP) medical devices are being used to help sufferers breathe. cPAP devices provide vital respiratory support by applying mild and continuous positive air (and oxygen) pressure to keep the airways open in patients who are able to breathe spontaneously; thereby helping them breathe and take up oxygen more easily.

Crucially, cPAP is an alternative to mechanical ventilation in the majority of patients, thereby reducing demand for intensive care beds and allowing ventilators to be reserved for the most critically ill patients.

Vision Engineering answered a call to manufacture and deliver essential components for a project to deliver 2,000 new cPAP oxygen flow monitors in just eight days; the design of the unit had taken only five days! The company's state-of-the-art machine shop capability and flexibility enabled it to support this urgent requirement immediately, meeting the customer's requirement within the tightest timescale.

Vision Engineering's manufacturing services provide extensive and modern milling, turning and grinding capabilities (both CNC and manual) and multiple additive manufacturing systems, in both its UK and USA facilities, connected by dedicated air/sea logistics. A multi-purpose paint shop facility is capable of refinishing a wide variety of materials, including ferrous and non-ferrous metals, along with a variety of plastics, paint processes including wet spray systems and powder-coating of any desired coating and colour.

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Vision Engineering is also celebrating winning a Queen's Award for Innovation 2020 for its Lynx EVO high performance ergonomic stereoscopic microscope. The Queen's Award for Innovation recognises exceptional achievement by UK businesses and is acknowledged as the highest UK award for companies. Lynx EVO is a high productivity eyepiece-less stereo microscope providing market leading ergonomic performance for intricate inspection and manipulation tasks.

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Manufacturing takes up the challenge

At a time of uncertainty, due to the spread of CoVid-19, it is reassuring that despite the challenges to our industry, so many companies are turning their hands to finding solutions in the design and manufacture of personal protective equipment.

3D printing is one area that is benefiting from the crisis. 3D printing specialist SYS Systems, part of the Carfulan Group, has launched a project to create protective face shields and is empowering manufacturers across the UK to do join the fight against the virus.

There is an urgent need to equip thousands of NHS workers, law enforcement professionals and other key workers with full-face plastic visors to enable them to work safely on the front line.

Derbyshire-based SYS is putting its range of Stratasys 3D printers at its Additive Manufacturing Centre HQ to work, with the aim of creating as many of the masks as possible and distributing them to those in most need.

It has also contacted all customers who own the relevant 3D printers required to do the work and sent them clear, Stratasys-approved designs and instructions to get started. The instructions are available for anyone manufacturer to download and use by clicking here.

SYS Systems managing director Matt Fulton says: "Like everyone else we have been inspired by the efforts of NHS staff and our emergency services in these uncertain times, so we felt it was our duty to do something to assist.

"3D printing is proving an essential part of the global response to the Covid-19 epidemic due to how quickly and reliably it can produce parts related to shields, masks and ventilators among other things, helping to address shortages.

"We hope our customers will join us in doing everything we can to arm key workers with the tools they need to perform their essential duties, and we thank them in advance for their support."

To help maximise hygiene and for ease of shipping, SYS Systems, a Stratasys UK platinum partner, is recommending that those able to print protective face shields allow letting the provider or end user of the items to assemble them.

Those who can produce visors or shields in bulk but who do not have a customer for them are being urged to send them to SYS Systems for wider distribution. The company is also making its 3D printers available for bureau work to ease the pressure being heaped on UK manufacturers by the coronavirus pandemic, with staff shortages and supply chain disruptions biting hard.

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Airbus to produce 3D-printed hospital visors in fight against Covid19

The majority of Airbus sites in Spain have joined forces to produce 3D printed visor frames, providing healthcare personnel with individual protection equipment in the fight against Covid-19.

More than twenty 3D printers are working day and night. Hundreds of visors have already been produced and dispatched to hospitals close to the Airbus facilities in Spain. Airbus leverages a patented design to manufacture the visor frames, using PLA plastics.

"One of the reasons I love my job is the capability we have for advanced design and quick manufacture. Overnight, we have gone from making aerospace concepts to medical equipment. This genuinely makes a difference in the fight against the pandemic and I couldn't be prouder of our teams working day and night on this Airbus project," said Alvaro Jara, Head of Airbus Protospace, in Getafe, Madrid.

Despite the pause of the majority of production at Airbus' sites in Spain following the Royal Decree of 29 March, Airbus employees are allowed on site to continue with this essential activity. In addition, Airbus in Germany also joined the project. The Airbus Protospace Germany and the Airbus Composite Technology Centre (CTC) in Stade, together with the 3D-printing network named "Mobility goes Additive," are now supporting this project in Spain, also coordinating the collection and transport of visors to the Madrid region.

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New agent appointed for Leadwell CNC machines in the UK and Ireland

A new sole agent for the UK and Irish markets has been appointed by Taiwanese machine tool manufacturer, Leadwell CNC Machines, Taichung. Newly formed WH-Lead Ltd is a sister company of Whitehouse Machine Tools, a long established agency for well-known ranges of machining centres and CNC lathes manufactured in Japan, Germany, Italy and also Taiwan.

With immediate effect, WH-Lead takes over sales and service of Leadwell's growing range of turning centres and vertical-spindle machining centres. Seamless continuity of supply in Britain and Ireland is assured, as Mike Heapy and Brendan Parrott from the previous agent, Lead Precision Machine Tools, have joined the new organisation. They bring with them 30 years' experience of the Taiwanese manufacturer and its products and additionally will be able to draw on the resources and expertise of Whitehouse Machine Tools in Kenilworth.

A representative selection of Leadwell machines will be available for demonstration in the new Towcester facility from May this year. Other machine models are available on short delivery from stock held in Europe and Taiwan. All can be supplied with either a FANUC or Siemens control.

In related news, Leadwell has announced that in its 40th anniversary year it has moved to a 43,500 sq m, purpose-built factory in Taichung with a capacity for building 100 machines per month. Production is evenly split between lathes and machining centres, which are sold worldwide by a network of 45 dealers.

Approximately one-third of production is exported to Europe. The manufacturer is proud of its progression from a seven-employee company when it was founded in 1980 to a global supplier of a broad range of CNC machine tools renowned for speed, precision, reliability and affordability.

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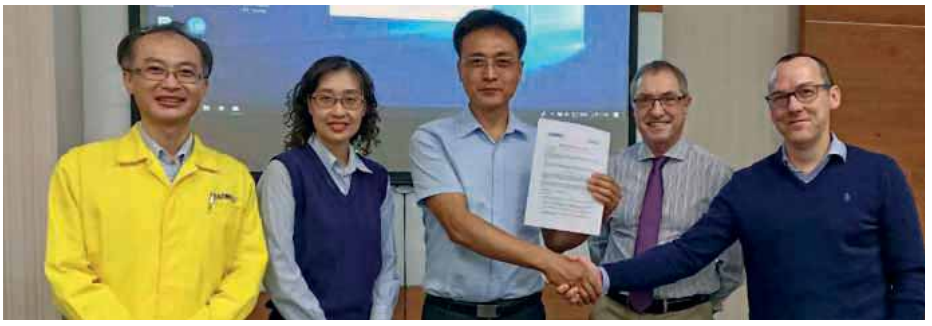


The new agency agreement being finalised in Taichung at the beginning of March 2020. From right to left: Tim Whitehouse, managing director, Whitehouse Machine Tools; Tom Hughes, sales director, Whitehouse Machine Tools; Gordon Chang, vice president, Leadwell CNC Machines; May Li, manager of overseas sales, Leadwell CNC Machines; Jack Hsu, general manager, Leadwell CNC Machines

Another first for Cambridge Precision

Mills CNC has, through its recently-created automation division, supplied leading precision engineering specialist Cambridge Precision Ltd (CPL) with a high-performance Doosan collaborative robot (cobot).
The Doosan M0617 cobot, equipped with ONRobot electrically-driven two finger parallel grippers and Schunk vices, was installed in the company's 24,000 sq ft facility in St Neots in July 2019 where it has been integrated with a Doosan DNM 6700 vertical machining centre to create a flexible and highly-productive automated manufacturing cell.

The cobot performs machine tool tending operations i.e. loading workpiece billets from a loading table into the DNM 6700 and, after the machining operations have been completed, unloads the finished machined components and positions them back on the table. By creating the manufacturing cell, comprising the cobot and a 5-axis machining centre and by creating new programs for different jobs, CPL is pushing the boundaries of human and machine collaboration.

The company manufactures complex parts and undertakes mechanical and electrical assembly for a number of customers operating in specialist markets. Quality and lead time fulfilment are critical and CPL constantly looks for ways to improve performance, support its workforce and delight its customers.

Nick Raven, CPL's general manager, says: "The cobot helps to free-up skilled labour by handling repetitive and less profitable tasks. Robbie, the cobot, has been welcomed by the team and has enabled team members to focus on other manufacturing and assembly demands."

The milling cobot cell is able to operate 24/7. Since installation, it has been digitally programmed to handle more than 20 different projects and the company estimates that, from a standing start two months ago, over 5,000 prismatic parts have been manufactured in the cell.

The cell, supported by a number of CPL's partners, including tooling specialists MA Ford, Guhring and Alpha-CAM, and metalworking fluid expert Q8Oils, is the company's first investment in advanced robot technology. Its results achieved to date suggest that it will not be its last.

CPL, celebrating its 25th birthday this year, is committed to innovation and continuous improvement. These twin strategies, evident across all of its operations, help explain the continuing growth and success of the company and why it is so highly-regarded by its large and diverse domestic and international customer base.

The company has a history of investing in the latest and most advanced machine tool and ancillary technologies and has, at its disposal, a range of multi-axis machining centres and multi-tasking turning centres to machine high-precision and often complex parts for its customers in the scientific laboratory, X-ray, medical device and research instrumentation sectors and industries.

A majority of the machines used by CPL are Doosan machines supplied by Mills CNC and a significant proportion of these have built-in automation.

Nick Raven says: "We are keen automation advocates. Recent machine tool investments in our dedicated turning cell include machines with a twin spindle, twin-turret configuration, as well as lathes with sub-spindles, driven tools and Y-axis capabilities.

"A number of our lathes have integrated bar-feeders that help facilitate continuous production."

It's a similar story with CPL's milling cell where the company has, over recent years, invested in a number of 5-axis machining centres to help it improve operational efficiency and increase productivity levels.

It was from a visit to Mills CNC's facility in Leamington earlier this year by CPL representatives to look at the latest Doosan simultaneous 5-axis machine in action when the potential of a cobot investment was realised and where the impetus behind the cobot acquisition began.

Andrew Barnard, CPL's milling supervisor, explains: "We had arranged to see the new Doosan DVF 5000 5-axis machine integrated

with an automatic workpiece pallet changer (AWC) at Mills. During the visit, we were introduced to the new Doosan cobot range and saw one of the models performing pick and place operations.

"We liked what we saw and could immediately see that this type of technology could be employed to good effect back at CPL, increasing our ability to meet challenging production issues and lead-times."

CPL had considered investing in an industrial robot previously but had not been able to justify the high investment cost or identify applications that complemented its skills development or capital equipment strategies. The fact that the M0617 cobot has a small footprint and does not need to be caged-off made it suitable for CPL's environment, acceptable to the workforce and cost-effective in terms of the value it delivers.

Prior to investing in its first cobot, CPL undertook a comprehensive feasibility study and cost justification exercise.

Andrew Barnard says: "We were looking to achieve an 18 month payback on the cobot investment and we believed we could do this by moving one of our existing machining centres, the Doosan DNM 6700, out of our milling unit into a newly-created automation area where it would be integrated with the cobot.

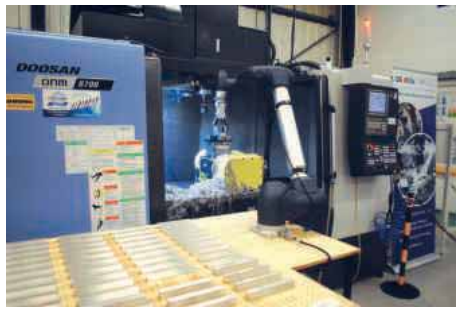
"The new cell configuration would help us increase the DNM 6700's production capacity, i.e. the number of hours it could be used cutting metal and profitability, i.e. autonomous machining with minimal operator intervention.

"As long as we could supply the cell with components that were the right size and weight and in sufficient batch quantities, ideally 200 to 300, we were confident that we could make it work."

The cobot acquired by CPL is a Doosan M0617 which has a 1.7 metre reach, a 6 kg payload capacity and features high-torque sensors on its 6-axis articulated arm. It was supplied to CPL with controller, a base unit and teaching pendant.

The cobot was set up by Mills CNC Automation application engineers and training was provided to CPL on-site.

Nick Raven concludes: "It's still early days, but we are delighted with the cell's performance and the decision to invest in collaborative robot technology has been justified.



"As with any investment in new technology, there is a definite learning curve involved but, thanks to Mills, it wasn't that long or steep. We are appreciative of the relationship we have with Mills and, I believe, we are both benefitting from the learning this journey provides.

"Such has been the positive impact of our first cobot that we are considering investing in a second in the near future and further developing our use and application of digital automation and artificial intelligence."

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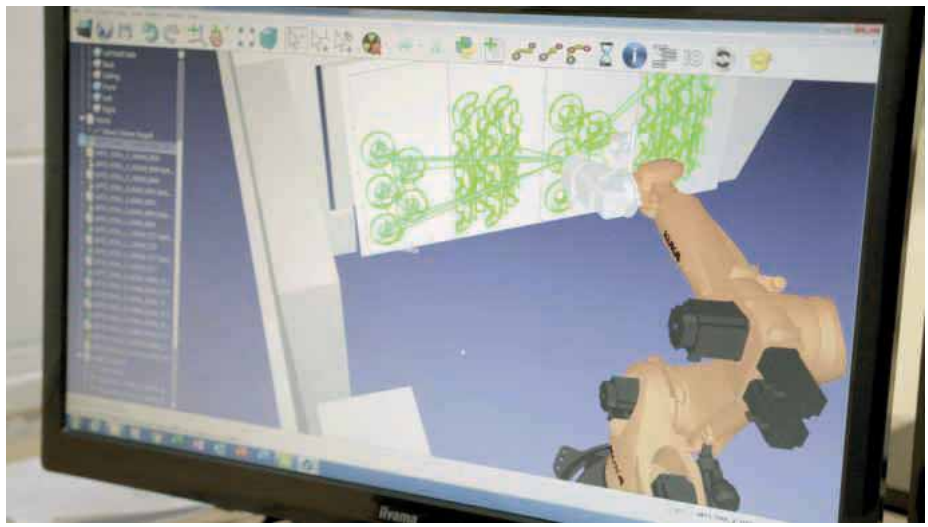
CNC robot driven by ALPHACAM cuts high temperature furnace insulation boards

A company manufacturing industrial furnaces and ovens has switched from a flatbed router to a robotic cell, designed and developed by CNC Robotics Ltd which uses a KUKA robot arm programmed with ALPHACAM and RoboDK, to cut its vital insulation material. Cutting speeds are now up to eight times faster.

Carbolite Gero uses Kerform insulation board to keep the temperature of its steel, zintec and Inconel outer cases down to around 60 degrees, while the internal temperature peaks at 1,200 degrees. The ovens and furnaces are used in testing facilities across a range of industrial sectors such as aerospace, laboratories and universities, to see how products and liquids react in a heated environment.

The company was already using ALPHACAM to drive its 3-axis Biesse router, but plant manager Nigel Holmes-Taylor says the Kerform board produces a highly abrasive dust when cut, which caused considerable wear on exposed parts of the CNC machine: "We came across robotic arms with a routing attachment and decided that was the route to take." It approached CNC Robotics, the UK's leading robotics integration company, who specialise in machining with robots, for help.

An important issue for Carbolite though, was that it wanted to keep its ALPHACAM programs and integrate this into the robotic cell. "No problem," says Nick Parry, systems engineer and technical lead, with CNC Robotics, who led the development of the single enclosed robotic cell.



When machining with robots, as CNC Robotics founder and owner Jason Barker explains: "We need to simulate the robot correctly, which gives raw data of where the robot goes, does it crash, and is the toolpath correct?

"Simulation is vital for checking correct posture, singularity, wrist and elbow, and axis limits. The importance of 'what you see is what you get' is critical. If it crashes on screen it'll crash in the real world. Using software such as ALPHACAM and RoboDK means you can correct all that before we go anywhere near the robot itself.

"Being able to convert the existing ALPHACAM programs that powered the router meant there was no downtime learning a new software. Carbolite were able to take their existing programs and redevelop them into the robotics world."

Martin Measures, ALPHACAM area sales manager, explains how they overcame the simulation issue: "Toolpaths created in ALPHACAM are passed directly to a RoboDK interface within the software, which simulates the robot kinematics. RoboDK is a specially configured Software Development Kit (SDK) which outputs the coordinate cutting data to drive the robot. It means we can see exactly what the robot's going to do before it processes the parts."

As Carbolite's new robotic cell can move at up to two metres a second, it provides a significant improvement over their previous manufacturing process. Nigel Holmes-Taylor says: "Cutting speeds are far quicker on the robot than on the flatbed router. While the router was restricted to working in 3-axis, the robot arm effectively has 6-axis, but can actually be infinite in the way it operates." His team takes the part files from drawings produced by the engineering facility, and imports them into ALPHACAM. He adds: "This brings all the cutting paths together and sends the program to the post processor, which is then fed into the RoboDK module for simulating the movement of the robotic arm."

As the Kerform board comes in a variety of thicknesses and temperature grades, the robotic cell designed by CNC Robotics provides an additional benefit versus a flatbed machine. Nigel Holmes-Taylor continues: "Thanks to a special rotating table, we've now got four positions on both sides of the bed, which means we can cut several different types of board needed to produce a full unit, at the same time. With the flat bed we could only deal with one

type of board at a time, so this gives us a four-to-one ratio of cutting it quicker. In some circumstances it's up to eight times faster.

"The rotating table that works this has a set angle at which the cutter hits the board and ALPHACAM, in conjunction with RoboDK, ensures the robot keeps to that exact angle at all times, cutting in a straight line and at the correct depth."

As the board has a high aluminium content, another improvement is that all the abrasive dust created during the cutting process is contained within the cell and drawn out through Carbolite's extraction system, meaning the overall environment is much cleaner.

Finally, as ALPHACAM can produce a full description of what needs to be loaded on

to each specific site on the loading bay, this allowed CNC Robotics to develop a piece of software to display the PDF generated by ALPHACAM. This means that operative loading of the machine knows the next material to load and where it has to go, saving even more time.

The partnership between CNC Robotics, ALPHACAM, RoboDK and KUKA is a perfect solution for Carbolite, according to KUKA's UK sales channel manager Tara Baker: "KUKA works with a system partner network. System partners like CNC Robotics provide even more industry-specific know-how. CNC Robotics designed and fully integrated everything into the enclosed cell, turning the robot into a highly effective CNC machine and ALPHACAM/RoboDK provides a back-up service for the software. It's a one-stop solution for Carbolite, helping them to future-proof their business."

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Toolmakers enjoy free weekends thanks to automation

The toolmaking division of Gateshead-based TDX, which supplies services and tools to the thin-film plastic thermoforming industry, mainly for food packaging applications, has started to automate its machine shop. The latest purchases have been a Japanese bar-fed turning centre and a German-built Hermle 5-axis machining centre with a 20-pallet storage system. The latter cell was supplied by UK, Ireland and Middle East agent Kingsbury during the summer of 2018 and has been working 24/7 ever since.

Two members of the management buyout team that purchased TDX in 2013, Neil Atkinson and David Renton, were especially pleased to progress the investment. 5-axis machining was usually the bottleneck at the 24,000 sq ft toolmaking facility and it normally fell to the two directors to go into the factory two or three times on both Saturday and Sunday to change over five non-automated 5-axis machining centres.

Since the Hermle C 250 with linked HSFlex automated pallet change system entered production, weekend visits have been unnecessary. Each aluminium thermoforming mould billet is pre-machined on one face and then milled on the other five sides internally and externally in one operation in from four to six hours. So 20 pallets equates to an average of 100 hours machining on the Hermle, more than enough to keep the production cell busy non-stop from Friday afternoon to Monday morning.

Neil Atkinson states: "The automated milling cell has not only eliminated manual intervention at weekends but also requires minimal attendance during the week, freeing the operator for other tasks.

"We approached six potential suppliers, all of which carried out machining trials for us. Kingsbury demonstrated the fastest cycle time on the Hermle, approximately 10 percent shorter than the best of the others.

"Equally importantly surface finish was also better, shortening the time spent on hand finishing our moulds."

It is notable that there were two main pre-existing machine tool suppliers to the

Gateshead firm. Neil Atkinson admitted that it was a big step to move to a new supplier for the automated milling cell but, 18 months, on he confirmed that the decision was correct. Not only has the machine been very reliable at producing the high precision moulds but the service and technical backup from both the manufacturer and Kingsbury have been in his words, "fantastic".

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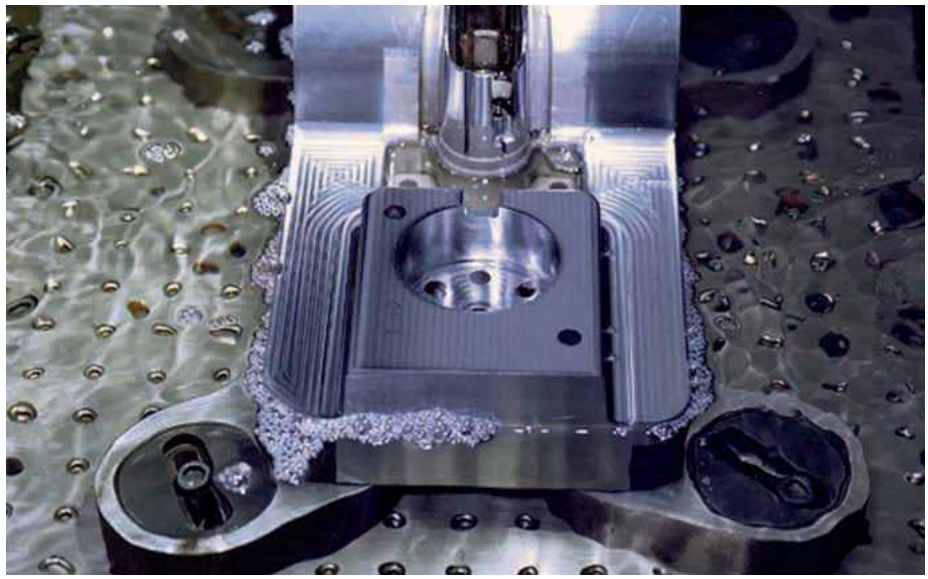
Erowa provides full automation support for new production lines

Taiwan's Sunspring Metal Corporation is one of the world's leading producers of cast metal goods. The company primarily produces and distributes zinc and brass parts, particularly for bathroom and door fittings. Here, two new production lines equipped with different machining technologies have been fitted with EROWA Robots. Aiding the automation further are EROWA workpiece tooling systems, measuring machines, wash stations, as well as the JMS 4.0 process control system.



"The aim was to improve our overall plant effectiveness by reducing machine down-time," explains Jeff Yang, senior director of engineering at Sunspring's impressive headquarters facility in Taichung. "But at the same time, we had to ensure that the produced parts would be of the highest quality and available on time."

Stable production processes are indispensable in tool and mould making and have to be guaranteed even when operating with minimum supervision or unmanned. Sunspring chose EROWA to supply the automation for the two production lines.

One of the lines runs Makino machining centres, one of which is specified for graphite, as well as several wire EDM machine tools. This setup is served by a rail mounted EROWA Robot Dynamic 250 XT. In addition, there is an EROWA CMM Qi measuring machine and an EROWA Lift.

The EROWA Robot Dynamic is the flexible and extendable handling system for economical loading of machining centres. It can automate the loading and unloading of between one and up to eight machines by running on rails up to 20 m long. 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 Robot Dynamic is suitable for loading large and small pallet loaded workpieces weighing up to 250 kg with various machine loading options.

The second line also consists of several machining centres, some of them working on five axes simultaneously. These are complemented by several EDM machines. This line is served by an EROWA Robot Dynamic 500 on a rail. Here, too, a CMM Qi is in operation as well as an EROWA RoboSpa wash station.

Palletised workpieces up to 500 kg or up to 800 × 800 × 500 mm in size can be loaded onto the machine tool safely and precisely with the Robot Dynamic 500. It has an exchange gripper system with which almost all EROWA pallet and system sizes can be handled. The robot switches to the relevant system according to the jobs it has been assigned. This removes any obstacles in the way of mixed and flexible manufacturing.

The EROWA Qi measuring machines fitted to each of the lines have been designed to be shopfloor hardened, with solid granite tables and specially cast portal structures. Stable linear axes move on high-precision rails with air bearings combined with symmetrical central axis drives to minimise the effects of thermal fluctuations. Fully prepared for automatic loading, it can be integrated into automatic production systems without any problems. The high-precision Renishaw measuring probe systems provide the highest degree of flexibility.

Whilst the mould inserts are being pre-machined, the relevant electrodes can be produced in parallel. The interface between machines and workpieces is guaranteed by EROWA tooling systems, ensuring the necessary accuracy and repeatability.

The workpieces are also fitted with RFID

chips that relay all the real-time data about every available individual workpiece in the system at any moment, such as presetting, current magazine position, scheduled machining processes and so on. This ensures process at every stage. Finally, EROWA's JMS 4.0 MoldLine process control system is used for the overall control of the production lines. Equipped with a wide variety of interfaces with order processing and production planning systems such as ERP, PPS, CADCAM and so on, it means that direct imports and feedback becomes substantially faster and more secure, while the current production status is recorded and displayed in real-time.

"The process control system is very important for us," continues Jeff Yang. "We wanted the production processes to be mapped in the control system. When an order is created in the JMS 4.0, the individual steps are defined far ahead of the actual machining date. Therefore, the availability of machines, electrodes and workpieces, as well as queries for CAM data, are part of the plan right from the start."

In the production process itself, the RFID technology has turned out to be extremely useful. "We are in full control of everything

that's going on at all times," explains Jeff Yang. "The RFID chip identification of electrodes and workpieces is the nucleus of the solution. Since the system has all the data of all the workpieces and is aware of their precise position in the process, there is always clarity about the state and correct execution of the work. This provides the operator with certainties meaning less stress and more comfort."

Globally the company employs around 6,000 people and everyone at Sunspring is convinced that they have set the right course into the future with this automation investment. Jeff Yang concludes: "This is about the fourth industrial revolution. We want to be ready for Industry 4.0. So, all the investments that are made from this point in time forward must be geared towards the ongoing development of I4.0. We are convinced that with EROWA we have got the right partner on board."

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FANUC enters new era of collaborative technology with first lightweight cobot

With a view to tackling global skills shortages and the need to increase production flexibility, FANUC has launched its first ever lightweight collaborative robot, the CRX-10iA.

While all six models in FANUC's current 'green' CR series of collaborative robots are closely based on the company's proven and widely used industrial robots, the new CRX-10iA collaborative robot is a completely new category. Launched at iREX, the world's largest robot trade show, in Tokyo, the CRX-10iA is intended to broaden the scope of collaborative work able to be undertaken between robots and manufacturing employees.

Unlike FANUC's existing CR series of collaborative robots, the brand new CRX-10iA is significantly lighter, weighing just 39 kg. As such, it can be easily installed across a broad range of applications such as driverless transport systems and automated guided vehicles (AGVs).

The CRX-10iA is available in two different variants: a standard-arm version with a reach of 1,200 mm and as a long-arm version with a maximum reach of 1,400 mm. Both variants have a maximum payload of 10 kg. Underneath the CRX-10iA's ergonomic frame lies a fully-functioning industrial robot built to the quality standards synonymous with FANUC.

A new innovation unique to the CRX-10iA is the ability to replace the Teach Pendant with a tablet computer, which increases ease-of-use thanks to a new user interface. Its intuitive operation will not only be of use to new users, such as the growing number of small and medium-sized companies looking to scale up their automation, but can also cut setup times for more experienced users, such as those in the automotive industry.

As with all models in FANUC's existing CR series, the CRX-10iA can be equipped with a vision system to enable autonomous loading and unloading of containers or shelving systems. The model on display at iREX showcased this ability by loading metal blocks into a ROBODRILL machine tool using a 3D vision sensor.

The CRX-10iA will be available to European customers from mid-2020.

For more information on FANUC UK's range of robots and automation solutions, visit: **www.fanuc.eu/uk/en**

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A cutting duo in action

Starrag ECOSPEED F 2040 flexible manufacturing system successfully implemented at Premium AEROTEC

Starrag machining centres with parallel kinematics have proven themselves a worthy addition to one of Europe's most advanced machine pools. This was reason enough for aircraft supplier Premium AEROTEC to opt once more for highly dynamic 5-axis simultaneous cutting with a tripod head for its plant in Varel. This increasingly revolutionary technology is also used in the new ECOSPEED F 2040 Starrag manufacturing system, which comprises two linked machining centres.

For Premium AEROTEC, Europe's biggest aircraft manufacturer, cutting pocket corners with an only slightly inclined land is a routine task that requires the angular position to be changed. While standard fork-type milling heads typically make huge swivel movements to do this, the tripod heads used in the ECOSPEED have significantly faster and more dynamic machining capabilities. Due to these advantages, there are now 13 ECOSPEED centres in use in Varel.

"In addition to their reliability, it was the high overall dynamism of the ECOSPEED machines that won us over," explains Christian Welter, head of large-part production at Premium AEROTEC. "This is why we chose two ECOSPEED F 2040 machines as our latest investment, which have been linked to create a flexible manufacturing system."

This is the newest highlight of Hall 8, where Starrag machining centres with a drive power of 120 kW currently take centre stage. An angled milling head that can be changed automatically now enables aluminium workpieces measuring up to 4 m long to be machined on the FMS; not just completely but in a single clamping position too.

Linked systems are the preferred choice at the Varel plant. Christian Welter explains: "We want to keep setup separate from actual machining this works extremely well with the new ECOSPEED F 2040 FMS, where we have operators work at separate setup stations."

The new Flexible Manufacturing System (FMS) consists of two ECOSPEED F 2040s, a conveyor system with double loading trolley, a ground-level setup point and storage for machine pallets measuring 2,000 mm x 4,000 mm. The machining centres operate at a nominal output of 120 kW and a nominal speed of 30,000 rpm. The duo enables highly dynamic 5-axis simultaneous machining with up to 1g acceleration and a maximum jolt of 250 m/s³.

The FMS boasts an angled milling head with an HSK A63/80 interface. This head can be changed automatically and receives tools from the tool change system automatically too. The angled milling head also carries out cutting and drilling operations, which used to be done on a machine supplied by a competitor of Starrag. To keep the footprint small, save space and facilitate maintenance, auxiliary units and control cubicles are installed on a peripheral platform above the conveyor system.

However, what is it that is particularly appealing about this latest investment, especially in the context of the Starrag claim "Engineering precisely what you value"? For Christian Welter, the principal advantage is the level of performance that can already be seen from this highly dynamic pairing, despite the fact that it has only recently

been introduced as part of series production; resulting in a 10 to 15 percent reduction in running time in comparison to older ECOSPEED systems.

Premium AEROTEC GmbH is a manufacturer of structures and manufacturing systems for aircraft construction and has its headquarters in Augsburg, Germany. The company was formed in 2009 when the EADS plant in Augsburg was merged with the Airbus Deutschland plants in Nordenham and Varel. The production facility in Varel plays an important role: The plant was established in 1936 as an engine factory, engine overhauling, spare parts production for truck and aircraft engines. Today it employs around 1,600 staff and produces nearly 5 million components a year, making it one of the world's leading high-tech sites for aircraft construction.

The company helped to develop the Varel Aeropark, which is now home to the supplier ThyssenKrupp Aerospace Germany GmbH and the Ausbildungszentrum Varel (AZV) national training centre, where Premium AEROTEC production specialists are trained.

Starrag Group is a leader in manufacturing high-precision machine tools for milling, turning, boring and grinding workpieces of metallic, composite and ceramic materials. Principle customers are internationally active companies in the aerospace, energy, transportation and industrial sectors. In addition to its portfolio of machine tools, Starrag Group provides integrated technology and maintenance services that significantly enhance customer quality and productivity.

The umbrella brand Starrag unites the product ranges Berthiez, Bumotec, Dörries, Droop+Rein, Ecospeed, Heckert, Scharmann, SIP, Starrag, TTL and WMW. Headquartered in Rorschach/Switzerland, the Starrag Group operates manufacturing plants in Switzerland, Germany, France, the UK and India and has established a network of sales and services subsidiaries in the most important customer countries.

Christian Welter, head of large-part production at Premium AEROTEC: "In this tender, we once again saw that the dynamism of the ECOSPEED machine is still in a league of its own."

The angled milling head makes it possible to carry out special cutting and drilling operations such as envelope machining, which was previously done afterwards on a different machine.

The most advanced pool of machines in Europe has recently acquired a Starrag ECOSPEED F 2040 FMS, which comprises two linked machining centres.

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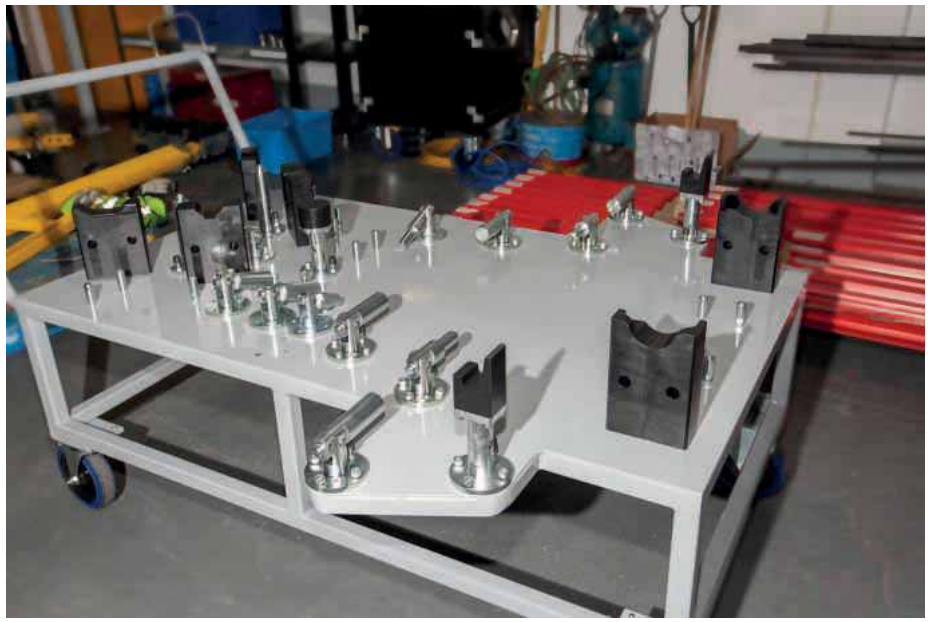
Carney UK chooses XYZ for in-house machining capability

Carney UK began life as a business development consultancy in 2014 to deliver the project management expertise of founder Simon Carney to small and medium sized engineering companies. While working on a business turn-around project for a fabrication company, things fell into place with Carney UK Engineering & Automation being invited to work as project manager on the design and development of fixtures for powertrain assembly for a luxury vehicle manufacturer.

This opportunity was the first step in the transformation of Carney UK into a leading designer, developer and manufacturer of bespoke assembly jigs and fixtures, production line equipment such as end-effectors for robots, pneumatic handling systems and special purpose machinery for assisted assembly, all with a focus on the automotive sector.

"Through hard work and dedication to delivering projects on-time and to budget we overcame the challenges faced by small businesses breaking into large OEM automotive manufacturers. We are extremely proud of what we have achieved," says Simon Carney. With a UK customer base ranging from prestige, low-volume, manufacturers through to high-volume vehicle producers, Carney UK develops solutions to their assembly and automation needs. This looks set to grow thanks to significant interest generated by its products, such as multi-purpose jigs that can be used on more than one model of vehicle, plus the rise in start-ups in the electric vehicle sector and interest from as far afield as China and its burgeoning automotive industry.



Initially, the machining required on the designs created by Carney UK was carried out by subcontract machine shops local to it in Runcorn. As demand grew and time-pressures from customers increased, these subcontractors began to struggle to deliver what tended to be lots of low-volume batches of parts. With the relocation to its current premises, Simon Carney therefore took the decision to start to bring machining in-house. Initially, this was low-key, with a few 'old' manual machines as stop gaps, but he recognised that investment in new machining technology was the way to go. Having employed Edward Hibbert as his technical manager, Simon asked his advice as to what the next move should be, his overwhelming response was XYZ Machine Tools.

"Through working with subcontractors, I had seen XYZ machines almost everywhere I went. This, along with the trust that Eddie put in them, convinced me it was the way to go. Our first purchase was an XYZ 500LR vertical machining centre, which was quickly followed by an XYZ CT65 turning centre. We then added further vertical machining centre capacity with an XYZ 750LR with 4th axis capability and, to round off for now, to cover smaller turning work we brought in an XYZ 1330 manual centre lathe."

The two XYZ LR machining centres, which make use of the latest in linear rail technology, provided the ideal starting point for Carney UK, with the Siemens 828D control system providing straightforward conversational control. At the same time the control allows the business to develop its use of CADCAM systems to generate programs and overcome the local challenges of finding skilled machine operators. They also provide the capacity needed for the vast majority of its components, with the XYZ 500 LR and XYZ 750 LR having axis travels of 510 x 400 x 450 mm and 750 x 440 x 500 mm respectively; with both machines featuring the same 8,000 revs/min 18 hp, 13 kW, BT

40 spindle and 20 m/min feedrates in all axes. These are complemented by the CT65 for turning capacity, with its 65 mm bar capacity and 23 hp spindle, a maximum turning length of 260 mm and maximum diameter of 200 mm, along with the use of the ShopTurn version of the Siemens 828D control, the CT65 provides a compact yet highly capable addition to manage the company's turning needs.

Simon Carney concludes: "The XYZ vertical machining centres and the addition of the 4th axis on the 750 LR machine, along with CT65, give us the versatility and competitive edge that we need, but most importantly we now have total control over our machining requirements. While initially we programmed at the machines, the move to use ONECNC CADCAM software is a further step for us in developing and streamlining our machining capability. We are now confident that we can machine anything that falls within the capacity of the XYZ machines.

"As we move forward as a business, we are confident that we will continue to expand and realise greater ambitions. While we first went to XYZ because of recommendations, we have developed a good relationship with them as they share the same dynamic and forward thinking outlook that we have. As we grow, I am confident that they will continue to provide the support we need to meet our future machining challenges."

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Redesigned sliding-head lathe offers 5-axis machining and three tools in cut

In response to feedback from users, Citizen's M32 sliding-headstock lathe, a popular model in the Japanese manufacturer's range capable of economical machining of components in small or large batches, has undergone a fundamental makeover in its fifth design iteration to the extent that half of its constituent parts are new. It is also considerably more robust, with a bed 500 kg heavier than that of its predecessor, bringing the installed weight to 4.3 tonnes. Availability of the 10-axis Cincom M32-VIII in the UK and Ireland is through Citizen Machinery.

The 10-station turret, which runs on hardened box ways, incorporates a new tooling system employing a single, heavier duty, 2.2 kW drive to the live cutters. Only the selected tool rotates; a world first for Citizen. The effect is to suppress heat generation and vibration, enhancing machining accuracy and surface finish. Power consumption is reduced and there is less the wear on gears and bearings.

The gang tool post has been equipped with 1.5 times faster live tools powered by a 2.2 kW motor as well as a programmable, 50 rpm B-axis to enable simultaneous machining in five CNC axes rather than four, while the back tool post with Y-axis now has adjustable-angle tooling. Both features enable production of more complex parts. Three tools may be in cut at the same time, supported by the Mitsubishi M850W control with 15-inch touch-screen, shortening cycle times and raising productivity.

The 8,000 rpm main spindle has been upgraded to 5.5/7.5 kW and the counter spindle is of the same power, representing a 2.5-fold increase. It improves the flexibility with which front-working and rear-working cycles can be shared between the two spindles. The Z-axis feed drive has been uprated to 1.5 kW for more powerful cutting performance, the 32 m/min rapid traverse rate remaining the same.

To improve operability and visibility and reduce setup times, the machine door and its window have been enlarged by 65 percent. Other enhancements include reduced overhang of the counter spindle headstock on its slideway to provide more robust support, larger and more rigid ballscrews, plus 30 percent lower air consumption.

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High-end solutions from Dugard

Dugard Machine Tools, the Brighton-based machine tool specialist, has enhanced the popular product lines that have become the bedrock of its brand.

It has introduced the prestigious range of Kitamura machining centres, with three high-end solutions. These machines, alongside the Hanwha XD26II sliding head turning centre, the impressive twin-spindle SMEC SL2500BLSY turning centre and the new Hanwha Series of Cobot automation solutions, further strengthen its offering.

The Cobot automation system and a sliding head turning centre demonstrate the vast diversity of technology now offered by Dugard. Of course, SMEC has long been a mainstay of the Dugard portfolio and the SMEC SL2500BLSY turning centre highlights exactly why this extremely flexible workhorse is so popular among UK manufacturers.

Built upon the foundation of a single-piece Meehanite casting that is heavily ribbed with a torque tube design, box way slideways are used throughout the SMEC range, resulting in outstanding vibration dampening and thermal displacement characteristics. This combination permits powerful heavy-duty cutting that ultimately enhances surface finishes, tool life, component quality and, of course, productivity levels. In addition, it's this build quality that is seeing customers report surface finishes comparable to grinding centres with precision levels equally impressive. Upon this sits a 10-inch chuck, 12 inch optional, with a 650 mm swing over bed capacity that allows a maximum machining diameter of 360 mm and a maximum turning length of 520 mm. This ensures the robust workhorse caters for the diverse demands of the industry. The SMEC SL2500BLSY has a bar capacity of

76 mm and a powerful 18.5 kW spindle motor that combine to enable heavy-duty manually loaded or automatically bar-fed machining of relatively large diameter parts.

Complementing the powerful high-speed main spindle, is a sub-spindle with a 6 in chuck that is driven by a 7.5 kW spindle motor capable of 6,000 rpm turning. The reason for the extreme popularity of the SMEC range from Dugard is the unparalleled level of flexibility, productivity and stability. With stability and productivity assured by the robust machine base and sub-spindle configuration, the flexibility is derived from the impressive live tooling turret. With 12 tooling positions, the heavy-duty turret features a large diameter 3-piece Curvic coupling and 7,816 lbs of hydraulic clamp force to maximise rigidity and deliver unsurpassed surface finishes and extended tool life. Each turret station is capable of accepting both milling and turning tools, with milling tools capable of reaching rotational speeds of 5,000 rpm, due to the high-torque 3.7/5.5 kW motor that drives the BMT65 configured system. This productive workstation is driven by a FANUC CNC control unit and weighs in at 5,600 kg.

The Hanwha XD26 is a relative newcomer to the UK sliding head sector and is part of the Hanwha range from Dugard that is already disrupting the market with its remarkably wide product range, astounding flexibility and impressive credentials. This flexibility includes the capacity for larger diameter bars than rival machines, the higher levels of spindle, up to 23 kW with driven tool power and impressive build quality. This is provided at a far more attractive price point than competitor machines.

The Hanwha XD26II is driven by the familiar FANUC 32i-B CNC interface, but the machine is also available with the powerful Siemens 828D CNC interface. The machine also incorporates the facility to rapidly switch from guide bush to non-guide bush operation. With a 26 mm bar capacity and a 6,000 rpm 5.5 kW spindle motor that is complemented by a 8,000 rpm 2.2 kW sub-spindle, the new Hanwha XD26II offers power, precision and flexibility to suit any small part turning shop.

The impressive Hanwha XD26II also incorporates a multitude of tooling configurations with five OD turning tools, an additional 10 front and back-working tools, five driven cross tool stations and also two driven and two static tooling stations for the sub-spindle, not to mention the gun-drilling station. With the configurable tool platens and positions, the Hanwha XD26II offers fast setup times, a spacious work envelope with plentiful operator access and, most importantly, kinematics that position all tool stations close to the workpiece for unbeatable productivity rates.

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When precision creates joy

Swiss subcontractor installs ultra precise Kern machine with System 3R automation

The headline phrase isn't commonly associated with mechanically engineered parts, but it sums up how one company owner views his production facility. Werner Buschor owns a medium subcontract manufacturing plant in Switzerland and had two growing problems. The first was that his customers' tolerances were getting tighter and on his existing equipment he was relying on his operators to 'tweak' the programmes and tooling to achieve the desired results. His second issue was that his production was reliant on his operators and as customer delivery times were becoming shorter, he had to look at production when the machines were not attended in the evenings and at weekends.

Founded in 1989, Buschor Praezisionsmechanik AG is always looking for real precision in the parts it manufactures, which include prototype batches with as few as 20 components up to production runs of 20,000+ parts. This huge range in the quantity of components produced by the Swiss company, tested the workforce when trying to be efficient. In all, it could be seen that Buschor had growing problems that every company experience. When trying to find answers to his accuracy problem, Werner Buschor found KERN Microtechnik and was soon able to realise that the KERN Micro machine was also able to help solve his second problem of working in the unmanned time.

As he explains: "The KERN Micro is the first milling centre that can stand up to our measuring machine, which we purchased two years ago. The measuring machine has a measurement uncertainty of half a thousandth of a millimetre and the Kern Micro offers a positioning accuracy of half a thousandth of a millimetre. The first KERN Micro was immediately connected to a System 3R automation system, with the possibility of adding another machine. The large tool magazine with 186 tools and the repeatability of the KERN Micro are ideal for automatic production. Finally, we can

manufacture workpieces that require the highest level of unmanned precision."

Key to this solution is the thermal stability of the machine with its smart cooling management system that ensures the temperature of the structural components of the machine remains constant with a maximum deviation of 0.2°C.

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Unprecedented cutting performance

Erodex UK, market leader in the provision of EDM wire, wear parts and other EDM consumables, has launched the fastest EDM speed wire available in the UK, gapstar ONE.

Working in partnership with bedra (Berkenhoff) Germany, the revolutionary wire will enable users to achieve unprecedented cutting performance across a broad range of applications, as well as uncompromising precision and surface quality.

Berkenhoff has built on the pioneering technologies of its previous high performance wire generations such as cobracut®, topas® and boline, to develop a new electrode and coating technology in TRIMPAC, featuring a zinc-enhanced coating.

"We are extremely excited about this new wire and how it can benefit the UK market", comments Brian Kelly, technical sales engineer at Erodex UK. "As well as dramatically increasing speeds by 40 percent to 60 percent compared to standard brass wire and typically 10 percent + compared to our boline H product, users will also see a significant increase in feed rates. This increase is achieved in both in rough and skim cuts, without necessarily adjusting current settings.

"A further benefit is the reduced wear of wire guides and power contacts, reducing downtime and ultimately cost. Thanks to the newly developed TRIMPAC coating, an accuracy to Ra of 0.25 microns can be expected, as well as increased stiffness and excellent straightness for auto threading."

"From stock, gapstar ONE will be available in 900 N and 500 N tensile strength, is compatible with all brands of machines and is available in most spool sizes. The wire has been received extremely positively in early customer trials.

"As with its predecessors, while gapstar ONE is more expensive than brass wire to purchase, dramatically increased wire speeds and its ability to achieve the desired surface finish means more throughput and increased efficiencies. Users can expect savings of up to 40 percent when compared with the topas Plus H 2.0 range for example.

"Simply using gapstar ONE will enable these benefits to be realised, but we are also able to work with customers to optimise their machine settings and generate even better results for them too," he concludes.

Erodex UK's strong working relationship with bedra (Berkenhoff) and vast experience within the EDM industry have cemented the company's position as the leading authority in the UK for all things EDM wire.

To learn more about how gapstar ONE can benefit your EDM performance, contact:

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Time to deliver

British luxury watch manufacturer Bremont made the most of Sandvik Coromant and DMG MORI's strategic partnership as it introduced a turnkey manufacturing cell to double capacity at its factory.

Luxury watchmaker Bremont Watch Company is a true British manufacturing success story. Founded by brothers Nick and Giles English in 2002, the company specialises in making chronometer-certified aviation-themed timepieces that are painstakingly assembled and pressure and quality tested at Bremont's purpose-built headquarters in Henley-on-Thames, Oxfordshire, UK.

The British military is a key customer, with watches such as the Argonaut finding favour among servicemen and women plus members of the Royal Air Force. Many watches are customised for specific units and regiments and demand for the company's designs, which retail from around £3,000 to £25,000, is growing.

That means Bremont's dedicated manufacturing facility, located a few minutes' drive from the HQ, is very busy. The factory has recently been able to double production capacity to make stainless steel top bezels, mid-sections and casings for six new watch designs. This is thanks to the introduction of a state-of-the-art 5-axis NTX 1000 machining centre from DMG MORI, using Sandvik Coromant tooling.

The project was six months in the making, explains Mathew Bates, a machine tool investment specialist from Sandvik Coromant's UK Machine Tool Solutions team: "From the beginning, the objective was to deliver a 'right first time' solution. We wanted Bremont to be able to use the new system straight away."

That meant working closely with engineers at machine tool manufacturer DMG MORI to select the appropriate tooling for the job as Matthew Bates explains: "We knew we had six new watches to make. Once drawings became available, we met with DMG MORI's application engineers to draw up a list of standard tools to use and decide where non-standard tooling was needed."

Bremont watches feature minute threads and chamfers, which sometimes require specialised tools. For one project, for example, Bates was able to track down the only company in the UK able to supply a particular type of tap. Matthew Bates continues: "When you are manufacturing something big, there is a lot more choice in terms of the tooling available. With something so small, you are limited in what you can use."

The DMG MORI NTX 1000 was installed containing a carousel of 30 tools specifically chosen for the job, with the option to expand to up to 76 tools. The Sandvik Coromant Capto® toolholder design was used. The twin-spindle machine is capable of both turning and simultaneous high-speed 5-axis milling. The system now machines from stainless steel bar to finished component without operator intervention, around the clock.

Frederick Shortt, applications manager at DMG MORI, explains that specialised workholding had to be designed and manufactured by a supplier for the NTX 1000 sub-spindle for the Bremont manufacturing processes. His engineering team spent time programming the machine with an offline CAM system and simulating the NC code produced in Vericut: "We spent a lot of time working on this before we went on-site. With Sandvik Coromant, we were able to streamline the number of tools required, so Bremont only bought what it needed."

This combined effort has meant teething problems have been kept to a minimum and a rapid return on Bremont's £500,000 investment is expected. James Rhys-Davies, strategic relations director, north Europe at Sandvik Coromant, says that implementing turnkey manufacturing solutions such as this is on the increase: "Although the upfront cost is sometimes higher, the benefits of a rapid ROI and the maximisation of machine uptime make turnkey manufacturing cells a highly attractive option, as the cost per part is typically much lower."

Once the new machine had been installed, Bremont was able to start full production of watch components immediately, exactly as planned.

Malcolm Kent, Bremont manufacturing manager, has been delighted with the results: "We've been surprised with how easy it is to produce components. We were struggling to keep up with demand from Henley. Now we are asking them for more work and that is the way it should be."

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Allied Machine caters to demand for cutting tool customisation

Allied Machine & Engineering Corp, a leading manufacturer of holemaking and finishing tooling systems, offers a range of customisation capabilities, including special sizes, geometries, substrates and coatings for tool bodies, blades and inserts with its online utility, Insta-Quote. The system lets customers design, quote and order customised tooling in minutes. For more complicated tools, customers can make use of Allied's experienced staff of application engineers, who will provide a quotation within two days, depending on the complexity of each request.

Allied's Insta-Quote utility is ideal for customers who may need a tool body that is longer, deeper, or shorter to miss a fixture, or who need special forms or a special geometry for difficult to machine materials. The service is most widely used for Allied's T-A® and GEN3SYS® products.

Customers can either register for Insta-Quote online or work with a local authorised Allied distributor to get set up and gain access to the utility. The user-friendly menu guides customers through a simple process to design, draw, and obtain a quote. It also provides lead time information. The system then instantly prints the quote, providing a drawing in PDF format within minutes. After approving the design by signing the tool drawing, the order is quickly confirmed, processed, and delivered through the local Allied distributor. The order is given a unique item number for future reordering and can be revised and changed as needed.

Also available is the Engineered Specials capability, in which seasoned applications experts work with end users to develop a solution unique to that customer. Allied can produce customised versions of any standard product offering, from simple modifications to shank length to more complex modifications that produce tools combining multiple operations. Its expertise with combination tools can drastically reduce cycle times and eliminate unnecessary steps in the manufacturing process. This can save significant amounts of money and dramatically lower the cost per hole.

Allied's responsive and technically advanced environment means experts can make highly customised tools at a reasonable cost with very short lead times. Tool bodies can be turned around in 20-25 days, while many custom inserts ship within 10 days.

Allied Machine & Engineering Co. (Europe) Ltd
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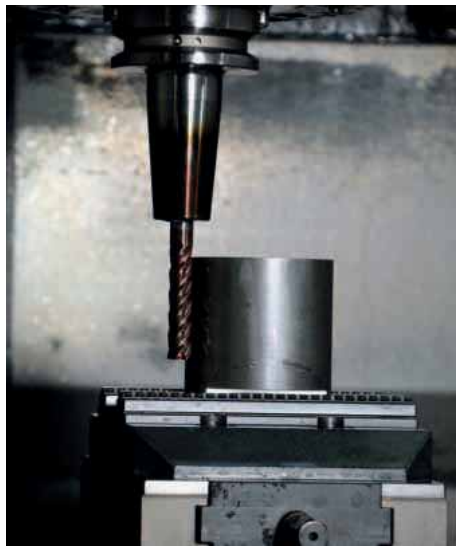
Maztech puts its confidence in tooling from ITC

As far as subcontract machine shops are concerned, Maztech Precision Engineering (MPE), genuinely is a trailblazer. Founded by managing director Wayne Bouchier at the youthful age of 25, the Letchworth company has purchased four Mazak machining centres that include a VTC-530C, an i-500 and the jewel in the crown, an i-300 AWC 5-axis 32 pallet machine that runs unmanned around the clock.

However, the journey to acquiring high-end machine tools was certainly an uphill struggle, as the entrepreneur started the business with little more than loans, family support, some good faith from Mazak, a sprinkle of luck and truck loads of hard work and determination. Six years later, the combination of hard work, research and experience has been combined with some innovative business nous that has seen Maztech invest in the right choice of machine tools from Mazak, high-end CAM software from OPEN MIND and, of critical importance, reliable, consistent high-quality cutting tools from Industrial Tooling Corporation (ITC).

Recalling the early days of the business and how the relationship with the Tamworth cutting tool experts transpired, Wayne Bouchier says: "During the first three to four years of business, we relied largely upon one prominent tooling vendor as well as a few smaller vendors. The combination gave us



access to a wide range of products that would suit our initial needs as a small business. The primary supplier continually promised us a vending machine, which never materialised. Simultaneously, the price of tooling kept fluctuating. As a small subcontract manufacturer, we sometimes factor the cost of tooling into our work, so ever-changing prices were unacceptable.

Instead of inviting every cutting tool sales rep to our site to conduct countless time-consuming trials, we asked 10 vendors to work with us on one single job."

Applying this novel and efficient route to selecting the most appropriate tooling vendor, Maztech had an EN24 component for the MoD that was required in a volume of 300-off. Utilising one of its 5-axis Mazak machining centres and high-performance CAM software from OPEN MIND, each steel cover component required over 10 minutes of continuous trochoidal roughing. So, Maztech asked the 10 leading vendors to supply a couple of their leading 5-flute solid carbide end mills to test. Each tool from each vendor was run at identical high-speed and feed parameters that had been agreed with each of the 10 cutting tool engineers from the various suppliers.

Wayne Bouchier continues: "Every company claims to have the best cutting tools, so we really put that theory and the confidence of the reps to the test. This was a genuine test of carbide quality and the performance of the tool geometries. I ran every single tool until it broke and then

recorded the data and tried the next tool as that was the fairest way of conducting the trials. The contrast in performance was staggering. We had one end mill that lasted just 30 seconds. However, most of the leading names in the industry machined five, six or seven parts, with some of the best performers reaching 10 finished parts before failure. The second-best tool managed to cut its way through 14 parts before failure, which we considered very good performance when measured against all the previously tried brands. However, the ITC tool was in a completely different league. ITC's Gary Bambrick supplied the ITC Widia 577C 5-flute solid carbide end mill and it blew everything else out of the water

"The ITC Widia 577C completed 25 parts

before performance started to diminish. Despite the deteriorating performance, the end mill just would not break. It was genuinely unbelievable. Basically, with the Widia tools, the carbide is so good that they hang on for dear life, they just do not break.

"Our decision to work almost solely with ITC has been fully justified. We used to spend upward of £3,000 per month on cutting tools, but ITC has helped us to half this cost. While a 50 percent cost reduction is impressive, what is more impressive is that we have doubled the size of our business, our productivity and our output in the last two years since introducing ITC. So, in real terms, without ITC, our tooling costs would be four to five times higher than what they actually are today."

A complete service

One reason behind ITC now claiming 99 percent of the tooling supply at Maztech is the service. Wayne Bouchier concludes: "We machine 1,000 steel blocks every six weeks for one aerospace customer and this job requires rough machining of 2 in cube sections. We were using a long series 5-flute, 10 mm diameter solid carbide end mill with a 42 mm flute length and

chipbreaker from our previous and unreliable supplier. At that point, ITC didn't have a 42 mm flute tool with the dimensions we required, but they produced one for us. The performance of the ITC 5-flute 10 mm diameter tool was comparable to that of the previous tool, so ITC revised the tool to extend tool life from 40 parts per tool to 50 parts per tool. This is a great testament to their service support."

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New helical end mill for titanium alloy machining

Japanese fine ceramics manufacturer Kyocera has introduced its latest innovation. MECHT has further enhanced the company's range of indexable milling cutters. Due to its ideal tool geometry, MECHT is ideally suited for applications in shoulder face milling, plunge cutting, and slot milling as well as ramping. Like the entire MEC series from Kyocera, MECHT features positive and very light-cutting, which achieves perfect 90° shoulders and smooth surfaces.

Unique design offers obvious benefits

Compared to conventional milling cutters in this category, the Kyocera product is characterised by a new combination of insert sizes. The larger bottom inserts are positioned at the first stage of the toolholder to handle larger and higher cutting forces. This stabilises the titanium alloys machining and significantly improves the fracture resistance. At the same time, the innovative design ensures higher reliability, as the bottom inserts are held in place by double-faced contacts. Another advantage is that the new flute design, large, smooth, prevents the chips from clogging. Thanks to this combination, MECHT reduces not only chattering issues but also renewed chip recutting issues.

Longer tool life ensures stable and constant performance

In addition to the advantages of the new tool design, the new Kyocera milling cutter is also more durable due to its conditions. The JS chipbreakers require a significantly lower cutting force than other cutters. Due to this extremely sharp cutting performance, heat development at the cutting edge is kept to a minimum, which again ensures a long tool life. Furthermore, MECHT was developed with heat-resistant MEGACOAT NANO coating technology. The tough PVD-coating, PR1535, increases the breaking strength of the product and the stable and long-lasting application possibilities as well.

Headquartered in Kyoto, Japan, Kyocera Corporation is one of the world's leading manufacturers of fine ceramic components

for the technology industry. The strategically important divisions in the Kyocera Group, which is comprised of 286 subsidiaries, as of March 31, 2019, are information and communications technologies, products which increase quality of life and environmentally-friendly products.

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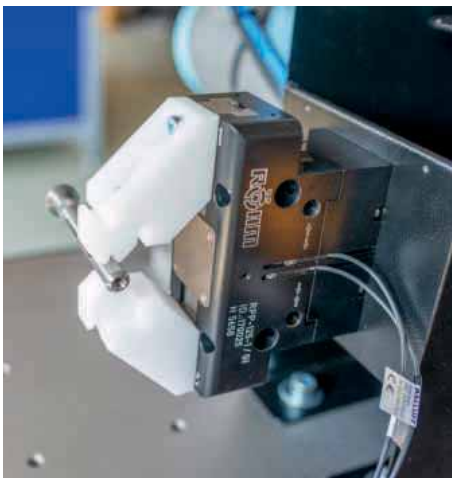
High clamping force

You can only use what you know. At BoKa Automation this would be grippers from Röhm. Based on many years of positive experience with products from the clamping device specialist, BoKa relies on two-jaw grippers for its newest development. With these, a robot grips individual workpieces for further part handling directly on the machine.

The word "start-up" usually paints the image of an e-business in a bustling office atmosphere, screens covered with those familiar Post-It notes and other typical clichés. As different as the business ideas might be, successful new entrepreneurs have one thing in common: fast growth of their companies. Mechanical engineer Severin Bobon and electrical engineer Simon Karl are two such successful, new entrepreneurs. Together, in 2014, they became self-employed part-time with BoKa Automation GmbH. The numbers show the success of this concept: the first balance sheet of 2016 showed a turnover of €320,000; now, three years later, this is likely to be around €1.8 millions.

Platform strategy in special machine construction

The company is founded on four pillars consisting of personnel services, control programming, special system and control cabinet construction, as well as the fourth division, service. Severin Bobon describes the company mission: "Our main goal has always been to provide the best possible service and solutions to our customers." This is a principle that was followed even in the development of CodaBot, the newest product from BoKa. CodaBot stands for



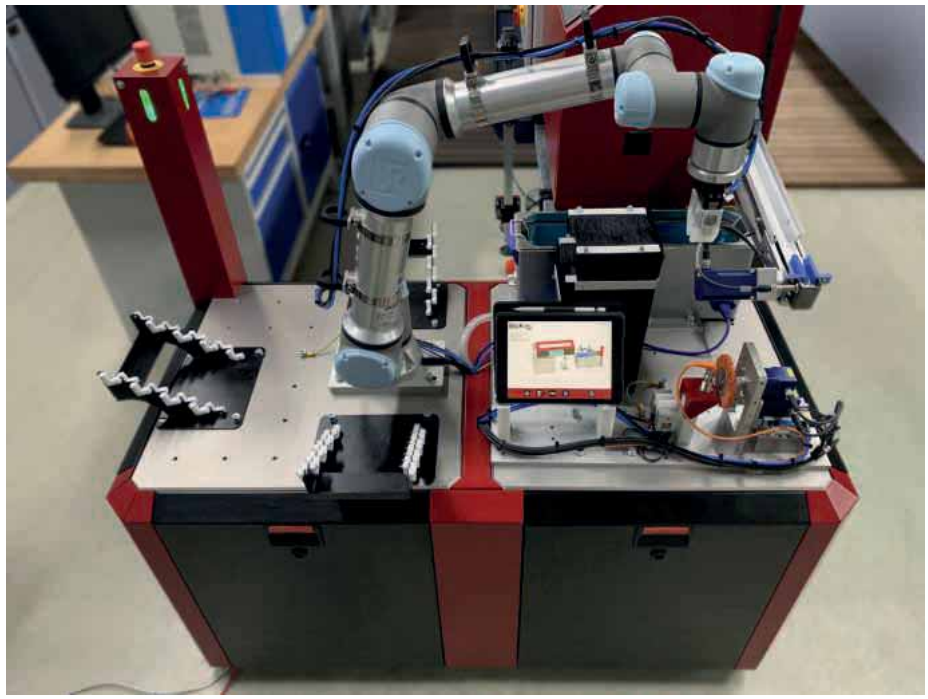
Collaborative Discharge Assistant Robot. It is a special machine used to implement a wide range of customer requirements, quickly and flexibly. The highlight is a machine platform with a clever hole pattern that forms the basic construction. Within the hole pattern, a wide range of devices can be anchored, such as robots, measuring machines and similar components, a mobile, modular system, which can be developed to form a complete machine. Severin Bobon explains the idea behind this in a nutshell: "A special machine which is based on a series machine and a standard building block system. Auto manufacturers do the same in the form of equipment lists."

More is doable with modules

From all this, the user can configure and create his desired manufacturing solution himself. He simply combines the different modules until the special cell is complete and perfect for his application. Since a wide variety of workpieces are to be handled with the respective applications, flexibility is the top priority, even for the grippers. "We bank on products from Röhm," explains Severin Bobon. He is very familiar with the grippers and their technology from his many years of professional experience. The managing director appreciates his good and faithful partnership with Röhm. Cooperation runs smoothly and capably, is goal-oriented and Röhm employees are always reachable. Therefore, for him "there has never been a reason to switch." He knows Röhm grippers inside and out: "Never change a running system."

Robot works collaboratively

The platform of the current BoKa development is called 'Cube System', which is based on a plate-bending welding construction in cube form, where such cubes can be strung together as desired. With the Cube System and the corresponding robots on it, mass-produced products can be handled directly on the machine. A system located near Hamburg shows how such a process can run. There, medical products,



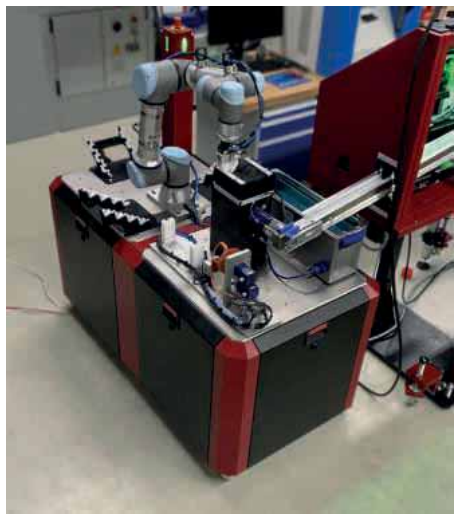
namely bone pins made of titanium, are removed from the turning machine automatically. Afterwards, a titanium chip is to be removed from a frontal thread bore, in order to be able to clean the bone pin in the ultrasonic bath. Afterwards, a device cleans and blow-dries the bone pin in order to then deposit the sensitive workpieces free of damage and scratches. This is a challenge, even for the grippers. Production is performed from the classical 3 m bar and the workpieces can be 100 mm in diameter. A two-jaw gripper is installed in this system, the RPP50 from Röhm, modified with special, technical features according to customer wishes. Depending on the workpiece dimensions, smaller or larger grippers are used, which can be pneumatically actuated and are designed to be self-holding.

High gripping force, low weight

A wide variety of such two-jaw grippers is available from Röhm. Equipped with two parallel fingers, they are especially suited for gripping round and angular-shaped workpieces. They have a compact design, have a low dead weight and high gripping force; properties which are especially beneficial for handling on robots or gantries. Versatile connection and fastening options also ensure maximum flexibility. Additional features of this design are the high gripping force with low dead weight, the great torque support by means of extended jaw guides when long gripper fingers are installed, as well as a long service life and high reliability, thanks to specially ground base jaws in T-slot guides. Inductive and magnetic sensors support the position query. Röhm also has versions with FKM seals in its product range for higher temperatures up to 150°C.

Special appreciation for quality

The special machine construction requires enormous versatility, which also applies to the grippers. To find customised solutions for this application, Röhm was able to draw on its wide product portfolio for the product recommendations for grippers, appreciating the open and flexible cooperation with BoKa and the clear requirements of the special machine manufacturer. The Röhm-BoKa partnership for this project ran very smoothly, as Severin Bobon concludes: "Röhm is a competent partner for us, one who is always reachable and who develops



goal-oriented solutions with us." His hope for the future: "That our customers may go along the same path we are going with Röhm with special appreciation for high quality over the entire time span of our many years of cooperation."

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Next-generation chucks are twice as accurate

Designed to reduce setup times on lathes, the new BR-series of 3-jaw chucks from Japanese firm Kitagawa are capable of a gripping accuracy of 0.01 mm TIR (Total Indicator Reading) or less when using optional T-Nuts Plus jaws. Repeatability of jaw exchange is within the same tolerance, even on the largest chuck. They are manufactured in 6-, 8-, 10- and 12-in versions and are available in the UK and Ireland through sole agent 1st Machine Tool Accessories.

BR chucks are now Kitagawa's standard offering and are interchangeable with its B-series and the large through-hole BB-series, which are both superseded. Its TIR could only be guaranteed within 0.02 mm.

Due to a new base jaw design and lower jaw lift, gripping forces at the maximum rotational speed of the chucks have been increased by 10 to 15 percent to enable better metal removal rates. High spindle speeds have been maintained throughout the range to enhance the surface finish of turned components.

On twin-spindle chuckers, which are becoming ever more prevalent in turning shops, the better rotational accuracy of the workpiece allows more precise synchronous transfer from the main to the counter spindle for second-operation machining. Gripping force is up to 153 kN for the 12-inch chuck while maximum rotational speed, attainable on the 6-inch model, is 6,000 rpm.

Every chuck includes a QR code on the side to allow data on the product to be downloaded. A video summarising the advantages of Kitagawa's new BR-series is available at **www.youtube.com/watch?v=MlV_cn4c6tA**

Established to offer a comprehensive selection of top-quality products at competitive prices, 1st MTA provides high quality workholding products with world beating technical support and assistance.

It takes away the hassle of searching for the best items from the finest manufacturers by only stocking high quality products. The company's specialist engineers carry out site visits, advise on the most appropriate

workholding methods for individual applications and, if possible, offer demonstration of the products performance. A dedicated team of technical engineers are available to answer your questions, provide solutions and offer outstanding service. Its constantly expanding and updated product range gives you the best possible choice, including: Kitagawa, IEMCA, Chick, Abbott, Darex, Brighetti, OK-Vise, Technomagnete, Walmag, Eclipse, V-Tech, TdeG, Effecto, Wogaard, BEST and Engineering Data.

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Leader says 'preparation isn't everything'

A centring vice from Leader Chuck Systems has been specifically designed to further enhance the productivity of multi-axis machining techniques. Part of Leader's ZeroClamp range, the 80 mm centric vice can be accurately secured to the machine tool's table, or any other workholding interface, either with the serrated multi-point clamping rail or via the zero-point clamping console, that uses HSK-like face and taper contact.

Specially developed forms on the jaws avoid jaw lift; they pull down as up to 17 kN of clamping pressure is applied to the workpiece. At this pressure, most materials can be securely held without any stamping or raw material preparation.

"This chuck negates the need to invest the significant capital required to purchase any material preparation equipment. All but high-tensile steel can be fixed without the lost time required to stamp billets and the holding pressure is great enough to allow full performance machining," explains managing director, Mark Jones.

Available with hard and soft jaws, the precise centre of the vice can be adjustable to +/- 0.02 mm, and it can be quickly rotated by 90o in just a few easy steps. "This function makes even further use of the flexible machining capability of 5-axis simultaneous cutting technology," says Mark Jones. "While the simultaneous movements of the machine tool's axes can provide exceptional cutting performance in one setup, the geometric form of some components will not allow the machine to approach all five faces. With the ability to rotate the vice jaws at a right-angle, engineers can gain clear access to machine every design feature required."

Leader offers bespoke engineering support for its products, which is crucial for any engineering business that is new to 5-axis machining or looking to invest in high efficiency machining techniques. Mark

Jones adds: "It is easy to purchase a workholding solution that, on paper, appears to meet the challenges of the manufacturing process. However, in its application this solution might not perform as required or expected. All of our staff are experienced engineers and the solutions they suggest will perform as specified."

Leader sees the attraction of magnetic workholding solutions

Leader Chuck Systems, has expanded its product portfolio for securing workpieces during machining operations with the addition of the extensive range of magnetic fixturing systems from Walmag Magnetics. These include permanent magnet, electromagnet and electropermanent systems for grinding, turning, drilling and milling, as well as wire and die sink EDM machining.

"Fixing the workpiece on a magnetised chuck allows easy access to five faces for the machine tool making it an effective way of holding the raw material for simultaneous 5-axis or 3+2 positional milling operations," explains managing director, Mark Jones.

"Previously part of the Walker Magnetics Group, Walmag has an established reputation for developing and manufacturing high performance workholding solutions using various magnetic technologies."

Designed to be robust and totally maintenance free, the range of Walmag permanent magnetic chucks are ideal for grinding. However, they can be used for all the above-mentioned operations. Activated by physically moving a handle they operate

with no electrical power supply, so they are easy to install and can be quickly transferred between different machines if required. A permanent magnetic system does not generate any heat so there is no risk of thermal deformation of the pole plate or the workpiece, helping to maintain machining accuracy.

The magnetic field in electromagnet fixture systems is generated by coils supplied with a DC current. The field is activated by a control unit that allows quick magnetisation of the workpiece. With the coil sizes designed to suit the application, a very strong magnetic field can be created resulting in a tight clamping of the workpiece, and they are typically suited to grinding and turning operations. Thanks to the powerful magnetic field it is possible to reliably clamp even rough workpieces, as it can overcome any gaps between the workpiece and the chuck. The control unit allows the magnetic force to be varied to suit the application and operation can be manual, automatic or combined and chuck sizes can be matched to suit the workpiece.

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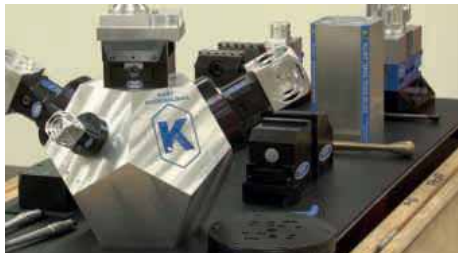
Customised workholding products for your application

Kurt brings more than five decades of experience in providing CNC machine workholding solutions and a deep understanding of how workholding integrates into today's productivity- and quality-driven manufacturing processes.

Its customised workholding solutions are built with the same dedication to quality and performance that's gone into its bestselling vices for over 50 years. The engineers have built Kurt's industry-leading reputation by helping assisting automotive, aerospace and other metalworking intensive industries improve quality and reduce cycle times.

Kurt's customised workholding solutions are easily integrated into new or existing automated cells and gauging systems.

The Kurt team will work with you to develop a solution that meets your application and performance requirements. It provides custom workholding devices for both horizontal CNC machining centres, vertical CNC machining centres and multi-axis machining centres. All Kurt vices are backed by a Lifetime Iron Clad Warranty.



Kurt has delivered countless customised workholding products for horizontal CNC machining centres, including: high density DoubleLock vice setups capable of holding 18 parts for aerospace machining operations; two-sided tombstones with six MoveLock clamping stations to accommodate different part sizes; serrated double-station vice towers on palletised machining centres for round-the-clock production; many other highly-specialised custom products.

Kurt has produced a wide variety of custom workholding products for vertical CNC machining centres. Examples include: high-density fixture clamping to accommodate four workpieces per station for hydraulic industry manufacturing; custom ClusterLock pallet vices that significantly enhance throughput for a medical device manufacturer; an indexing trunnion fixture that allows for three-sided machining in automotive applications; countless other customised vices and workholding solutions.

Kerf can provide custom workholding products for your 3-, 4-, or 5-axis CNC machining operations. Its multi-axis solutions provide the versatility and articulation you need for even the most complex machining operations.

To request a quote on the customised workholding system for your application, contact:

Kurt Manufacturing
Tel: 001 763 572 1500
Email: workholding@kurt.com

New catalogue from ROEMHELD

With the new catalogue "Everything for quick die change in automatic punching machines and high-speed presses," ROEMHELD addresses prospective customers from the metal forming industry with presses between 30 and 300 tonnes. The setup time optimiser shows clamping elements and die changing technology that protect the tool, improve workpiece quality and increase productivity. They are specially designed for the limited space available on small press tables. Since dies often cover these completely, there are currently very few quick clamping systems on the market.

ROEMHELD has extended its series of hydraulic and mechanical clamping elements to include lower sizes for use on small press tables. The range includes sliding clamps, hollow piston cylinders and hydro-mechanical clamping nuts with clamping forces up to 30 kN and with a diameter of only 50 mm. They are suitable for installation in T-slots from 12 mm.

For hazardous conditions, the company also offers magnetic clamping plates that are permanently installed on the press table. This allows dies of any size and geometry to be securely clamped in seconds, even when space for the use of other clamping elements is very limited. With the aid of roller and ball bars, which can be used to move the die effortlessly, setup can also be simplified and accelerated. ROEMHELD has expanded its product range accordingly for use on press tables in automatic punching machines and high-speed presses. Die changing carts with a load of up to 1,600 kg complete the range.

Andreas Reich, product manager Die Clamping Technology, sees great potential for increasing productivity with little effort when changing dies in automatic punching machines and high-speed presses. In many cases, dies are still clamped with screws, with fatal consequences. "This does not only take a long time, but the die is also often distorted, so the production output suffers and upper dies wear out very quickly. Simple hydraulic or mechanical clamping elements are quickly retrofitted and pay for themselves within a short period of time."

With its extensive portfolio of die clamping technology, the setup time optimiser ROEMHELD solves almost every

clamping task in sheet metal forming, plastics and rubber processing. The magnetic, hydraulic and electro-mechanical clamping systems are highly versatile and contribute to making processes in single and series production of nearly all industries more efficient and economical. Products for die change such as die changing carts, roller bars and driven carrying consoles complete the product range.

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Stamp of approval

How robotic marking keeps track of aerospace engine parts

Aerospace components must be marked so they can be tracked effectively and robotic marking techniques help to ensure that this is done quickly and accurately. Dan Stephenson, machinery sales manager of Pryor Marking Technology explains:

The aerospace sector recently had its safest ever year, reporting zero fatalities from commercial flights in 2017. For good measure, 2018 was the third safest year since records began.

Despite this success, operators are still concerned about the spiralling number of insurance claims. A recent report , from Allianz and Embry-Riddle Aeronautical University, said that 12 percent of claims were down to faulty workmanship or maintenance and six percent were caused by breakdown. Anything that can help to bring these factors down could help the industry to minimise the soaring cost of compensation.

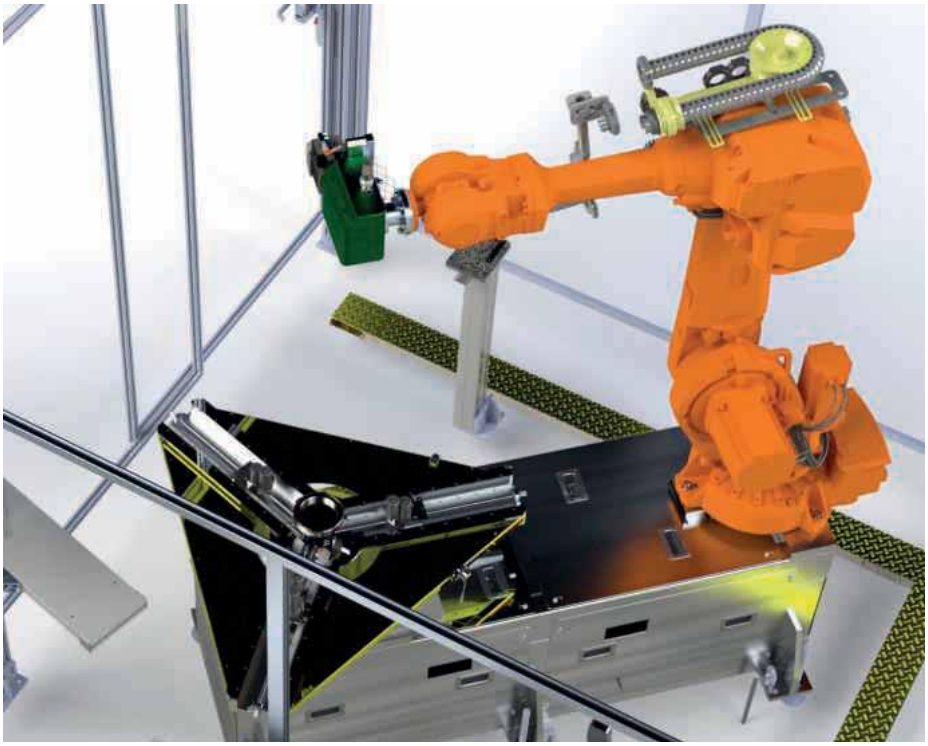
As a safety-led industry, the aerospace sector already has many specifications in place, governing conditions such as which materials can be used in the manufacture of parts and how these parts are tested.

A lesser-known stipulation is that parts such as engine components must be permanently marked, so that each has a unique identity. Despite the importance of marking, it adds no value to a part and has no effect on performance. Yet it is a critical process; the markings applied to a part during production allow it to be efficiently tracked and replaced, as well as correctly maintained and positioned. These factors could help chip away at some of the problems, such as maintenance and breakdowns, that lead to rising insurance claims.

Marking is often mandatory in the aerospace sector. Industry specifications such as the UID standards laid down by the US Department of Defence, or SAE International's AS9132 marking standard, insist that parts are permanently marked, to give them a unique identity. This is achieved by printing readable information and a Data Matrix code, a 2D barcode similar to a QR code, onto the surface.

The unique ID is a 'passport' for the part. It includes all kinds of information on its manufacture, such as where the material came from and which operator was running the machine when it was made. This allows ultra-precise traceability, which is critical in the case of part failure.

In addition, individual manufacturers have their own rules on marking which include adding critical engineering details, plus specific details on how components are assembled within the engine.



Robotic revolution

Historically, aerospace parts were marked manually, a process that, to some extent, remains in place today. Some short-run parts, which are not too expensive, can be marked adequately using hand-held devices.

However, the largest and most complex aerospace engine components can be incredibly expensive, with some worth more than £100,000. These parts often require multiple marks to be made in precise locations, requiring a more sophisticated technique such as robotic control. Marking this kind of part by hand and making a mistake may render it completely worthless.

As well as traceability, engineering information is also critical. For instance, the thrust value of individual turbine blades will fluctuate slightly due to manufacturing variability. When assembling a fan, this variance must be taken into account so that blades are properly balanced. Any discrepancies will be multiplied when the blades spin at high speed. This makes the thrust value a critical engineering value, so it is etched onto each blade after manufacture.

Robotic marking systems are generally used on round or cylindrical aero engine parts, such as disks, rings, blades and bladed disks ('blisks'). While a robotic arm can typically handle any type of marking system, the industry prefers dot peening to create permanent marks on metal components. It generally works on all component sizes, including the very largest, of 1 m in diameter or larger.

In the early days, when robotic control was restricted to smaller aero components, the component itself was moved to the

marking head. Now that far larger parts, such as blisks, are involved, the robotic control has moved to the marking head. This increases accuracy and means that multiple marks can be made across the entire surface of the part, to very tight tolerances.

Checking quality

During marking, a large aero engine part is craned into a marking cell, loaded onto a rotary table and clamped in place. An operator scans the part's unique identity, which then brings up a program with marking instructions. These are performed by the robot-mounted marking head. The whole process is typically controlled by special software, which links to the manufacturer's plant manufacturing system.

A large and expensive part like a blisk may require 15 or more marks to be made at various points, with positional tolerances of around 0.1mm. On top of this, a typical aero engine will have hundreds of parts that need to be marked in this way. Doing this manually would be very difficult to achieve.

Marking systems can be combined with vision systems, to help validate and verify that marks have been properly applied. They can check that the marked information is correct and that it meets specifications, such as ensuring that it has the correct marking depth.

A vision system also helps to ensure that the original positioning of the mark is correct. While this information will be loaded as part of the marking program, a mark may have to be made relative to a certain feature of a component. The camera can find this feature and apply an offset to the marking program.

Marked improvement

A full-sized robotic marking system can be difficult to justify on price, even in the aerospace sector, especially when it handles quite a small number of parts. However, users often put it to work on a wider range of parts, including smaller ones that might previously have been handled manually. Using 'idle time' to mark smaller components can lead to more efficient marking and better traceability.

Aero engines are becoming larger and more complex. This is likely to continue, especially as engines must operate at higher efficiency. As this happens and large parts

such as blisks become more commonplace, the need to track and assemble individual components will grow in importance.

Robotic marking can help to achieve this and may also help to slow the rising number of insurance claims caused by maintenance and breakdown problems.

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A swimmingly good solution

Precision laser marking for leading dive equipment manufacturer

Established almost 50 years ago, Apeks has grown to become one of the world's most respected manufacturers of diving regulators. Now part of the Aqualung Group, the company operates from a purpose-built manufacturing facility in Blackburn, Lancashire, where its regulators are designed and manufactured.

With total control over the manufacturing process, Apeks has become the industry benchmark for regulator design, quality and performance. Apeks regulators were first to pass EN 250 (the European standard for regulators) and first to be awarded the CE Mark. The company is on the approved contractors list for the supply of diving equipment to armed forces around the world and supplies various emergency services, including coastguards, police and fire services.

In a sector where precision engineering, product quality and safety are paramount, Apeks has always clearly marked its regulators with a variety of user information. Today, this typically includes regulator model, CE mark, product serial number, direction of swivel and high-pressure ports.

With just a single laser marking machine on-site and a growing product range, in 2019 Apeks made the decision to invest in the latest lasering technology. "While clarity of marking was obviously essential, we wanted a machine that would also speed up the lasering process, offer the very latest capabilities and be sufficiently versatile to mark a wide range of components," comments Adam Mansfield, maintenance supervisor at Apeks. "We therefore invited a number of laser marking technology specialists to tender. Only Technifor, however, took the trouble to visit us to discuss our requirements. They also brought along their specially equipped demonstration vehicle, so we could see first-hand the quality, clarity and speed of lasering provided by Technifor machines."

Following advice from Technifor's technical sales engineer Simon Tims, Apeks chose a Technifor H20 (20W, hybrid) laser marking machine, equipped with a 3D lens and rotary attachment and housed in a Technifor LW3 workstation. Before placing the order, however, he arranged for the Apeks team to visit a company that was using a similar Technifor model. "This was incredibly useful," says Adam Mansfield, "as we were able to see the machine in use and talk to the people who operate it on a daily basis."

The Technifor H20 laser machine was chosen by Apeks for its ability to precision-laser a wide range of materials, including metals and plastics. As a multi-purpose hybrid machine, the H20 offers a variety of marking effects, including contrasting, discreet, deep and surface marking.

This feature was seen as a significant benefit by Apeks, as it meant that in addition to marking safety and user information onto the plated brass and plastic components used in the company's regulators, it could also be used to apply aesthetic details and branding. Perhaps more significantly, however, the H20 machine's 3-D lens enabled marking of uneven surfaces, while rotary capability meant that cylindrical components could be marked in a single pass.

As Technifor's largest standard workstation, the LW3 was selected by Apeks for its ability to accept components in a wide range of sizes

"Our new Technifor H20/LW3 system was installed in under a day," adds Adam Mansfield, "after which, full staff training was given. From first contacting Technifor to installation and training, the whole process has gone extremely smoothly and the level of support we have received from Technifor has been exceptional. Even though the Technifor machine is extremely easy to use and has intuitive programming, Simon visited us just a few weeks after installation to make sure we were happy with everything."

Since installation, Apeks' new Technifor laser is bringing enhanced levels of speed, accuracy and capability to the regulator marking process. The company believes that the new machine will also enable it to more than double the quantity of regulator sets that it currently marks in a day.

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Traceability for bar and metal stock

Universal Marking Systems (UMS) has created a complete dot peen marking solution that enables full traceability for bar and other metal stock which is quick and easy to do. It enables identification at all stages of production from material delivery, processing, through to final component production and material stock.

The Multi4 Mini dot peen system is the ideal machine, as it is extremely lightweight at only 2.3 kg and can orientate into any position for marking. It can mark both small and large items with ease. The controller for the Mini is compact and portable and can house a rechargeable battery with integrated charger allowing hours of marking anywhere in the factory or even outside.

One customer recently had an application to mark the end of bar stock. This was to mark material grade and batch number for full traceability in their large production facility and meant that the cut bar maintains full traceability. When material is taken from stock and processed, the off cuts can be re-marked and put back into stock to maintain traceability.

UMS created a range of custom feet that can mark along the length of flat or round bar stock or on the end of bar. The feet hold the part in place for exact positioning and deliver fast, accurate marks. Other applications include a custom clamp marking batch numbers on 1 mm stainless

steel sheet and offcuts without causing distortion.

The Mini is extremely easy to use, as functions are accessed from a single layer so data can be input quickly and viewed easily on the large high definition colour screen. Data input can be manual, a barcode reader can be connected to the controller, or the controller can be connected via usb to a PC. Human readable alphanumeric data or datamatrix can be marked.

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Iconic technology from the world leader in industrial traceability

SIC Marking has once again proved its high innovation capability with the launch of two new products, the i-Speed integrated Dotpeen marking machine and the XXL-Box Laser Enclosure

SIC Marking is expanding its range of dotpeen marking machines with a new integrateable pneumatic system - the i-Speed. Using continuous vibrating technology, which enables marking components in a continuous line, this new machine meets an increasingly specific need of companies in the industrial sector and is a further example of the attention SIC Marking pays to its customers.

Many of its customers have asked SIC Marking for a high-speed machine to mark a few characters on very high-speed production lines. The company has therefore developed a suitable product

capable of marking up to 10 characters per second and extremely compact to fit easily in a confined area.

The features highlighted by Eric Brechenmacher, sales and marketing director at SIC Marking Group, have been thoroughly studied by the technical department in order to make the i-Speed one of the fastest and most compact machines on the market.

"The design and use of a lightweight stylus make it possible to optimise the mechanics and consequently to obtain significant gains in the size (218 x 107 x 62 mm) and weight (1.7 kg) of the i-Speed. As for the very high marking speed, this was achieved thanks to the reduction in the mass of the moving parts," explains Xavier Ducret, technical director at SIC Marking. Last but not least, the use of a pneumatic stylus eliminates the problem of overheating and allows the machine to be used at very high speeds.

All these features make the new i-Speed particularly suitable for use in highly demanding environments, where constraints can be found in fully automated production lines, in areas like automotive equipment applications or profile manufacturing.

The new i-Speed from SIC MARKING, already adopted by many of its customers, has proved its worth on the production lines of a major Italian automotive supplier specialising in headrests and armrests. Thomas Denis, export sales engineer at SIC Marking explains the project in detail:

"We were contacted to mark a 15-digit identification number on headrests. The main constraints in using this machine were centred on the space available for the marking head as our i53 machine, usually used for this type of application, was slightly too long. The marking tests carried out with the i-Speed, after validation by the customer, made it possible to confirm the stylus assembly corresponding to the customer's requirements."

Record working dimensions for the new XXL-BOX

"After the huge success of the LBOX and XLBOX, our compact marking stations, we have been asked on numerous occasions to offer more space for marking large parts. With the XXL-BOX, which is available in three basic sizes, we now cover all our customers' needs in terms of box size at a very competitive price," says Eric Brechenmacher on the launch of the new XXL-BOX laser marking station. As its name suggests, the XXL-BOX offers record working dimensions (up to 520 mm high) as well as long lengths, thanks to its three standard models (800, 1,200 and 1,600 mm wide) and its numerous accessories. The strength of this new product also lies in its ability to adapt perfectly to different customer needs, illustrating SIC Marking's extensive know-how in the realisation of tailor-made solutions.

"The XXL-BOX is ideally suited for the classic use of its large working volume, but also enables the project manager at SIC Marking to offer customised solutions for more complex large-volume marking applications. Automatic three-dimensional axis and automatic loading systems are just a couple of examples of the applications that our technical teams offer to meet our customers' needs," explains Nicolas Eecoiffier, project manager at SIC Marking Group.

Here again, the system has been a great success, especially with integrators and customers who integrate it into robotic stations, with all the laser-related safety features already in place. Its numerous options, such as a loading drawer or turntable, also make it easy to use in manually loaded marking stations.

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Integrating laser and vision improves quality for manufacturers

Maintaining the highest levels of quality control at all stages of manufacture is essential if defect free products are to be dispatched to customers. Invariably there are multiple operations during the manufacture of a component, presenting a number of different opportunities for mistakes to be made and subsequent value to be added to a component that may already be incorrect from a previous process.

Of course the final inspection stage will undoubtedly find the majority of components that do not conform to specification, however not only is this too late, but on occasions a small number might slip through and reach the customer. This leads to additional cost relating to return and replacement and also has a damaging effect on the perception of quality and performance overall.

This article by Andy Toms of TLM Laser, UK and Ireland distributor for FOBA Laser, highlights the quality control benefits that can be realised by introducing the combination of laser marking and patented machine vision technology to manufacturing processes.

Laser marking is used widely across many different industry sectors to identify components, or add traceability information through a combination of alphanumeric text, bar codes and 2D matrix codes. This information can be used in a number of ways; at different stages of manufacture and also in the field to validate component authenticity and / or confirm date of manufacture and batch number etc.

The information contained within these marks only has value if the content is actually correct, produced on the right component and in the correct position on the part. There is little point in having valuable information that is inaccessible once the component is integrated with in a larger assembly, such as may be the case on a vehicle.

A reliable solution to these problems comes in the form of FOBA's Intelligent Mark Positioning (IMP) feature. This innovative and patented solution automatically detects workpieces and also checks part geometry and its position before aligning the mark and engraving accordingly, ensuring precision and repeatability. IMP ensures consistent premium-quality marks and therefore delivers a measurable reduction in the number of defective products.

Intelligent Mark Positioning is ideally suited for automated volume production, especially in relation to the aerospace, automotive, electronics industries and of course the medical technology sector. Intelligent Mark Positioning offers optical inspection and verification functions at both the pre and post process stages.

Prior to marking, images of the part are acquired to determine that the part presented to the system is actually the correct variant. This is achieved through the use of shape recognition algorithms. This feature is also extremely useful where a tray of parts may have been presented for processing. If there is one or more parts missing within the tray, the vision system will recognise this and only mark in the positions where parts are present.

This ensures that part serialisation during marking remains sequential and correct. Without IMP the laser would operate over the empty pockets and therefore not only would component serialisation be incorrect, any missing parts would need to be manufactured and then marked correctly to match the gaps in the serialisation sequence.

Post marking, Optical Character Verifications (OCV) checks are performed to determine a number of criteria. These include: determining whether the marks are accurate in relation to position and alignment, confirming that all of the information that should have been marked is actually present on the part, checking the completeness of logo's etc. and reading, verifying and grading the quality of bar-to ensure quality conformance and contrast between the mark and the background, ensuring that the mark can be reliably read in the field.

Additional features include the capability to accept serial number data directly from a database, eliminating the potential for error due to operators entering incorrect information. Serialisation is also useful for internal monitoring and traceability of work in progress at all of the different stages of manufacture. Combined, these features deliver significant value for manufacturers by reducing the risk of errors through 100 percent inspection pre and post marking, with each check taking just a fraction of a second to perform.

TLM Laser
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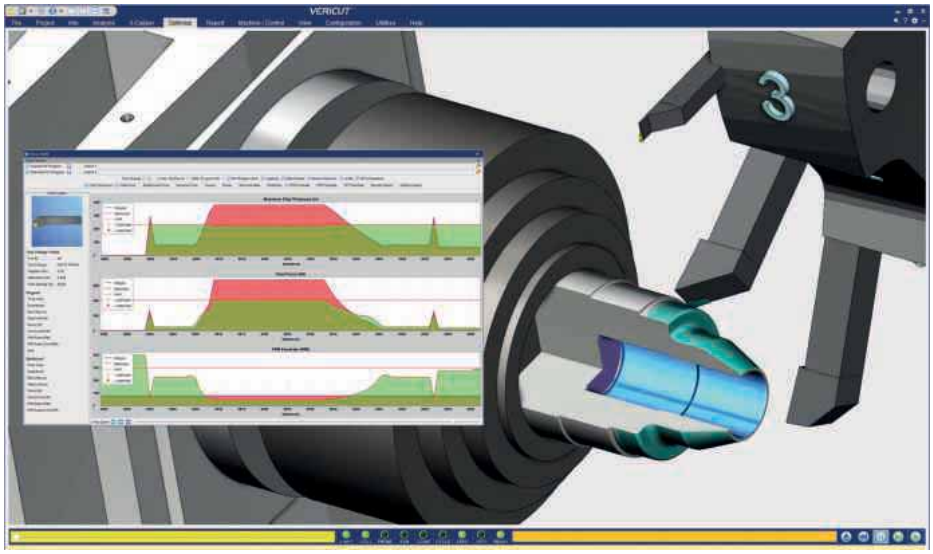
Take back control and stay one step ahead

VERICUT Force revolutionises NC program optimisation

VERICUT Force is new and is leading the way. The physics based software module for NC program optimisation analyses and optimises cutting conditions during the entire NC program operation. Taking into consideration the respective material, cutting tools and the machining conditions, VERICUT Force generates the maximum reliable feed. Current users see it as one of the best tools in the world of machining in terms of effectiveness and usability. Gavin Powell, technical director at CGTech Ltd discusses the benefits of VERICUT Force.



What is Force?
VERICUT Force is a physics-based NC program optimisation software module that analyses and optimises cutting conditions throughout NC program operations.

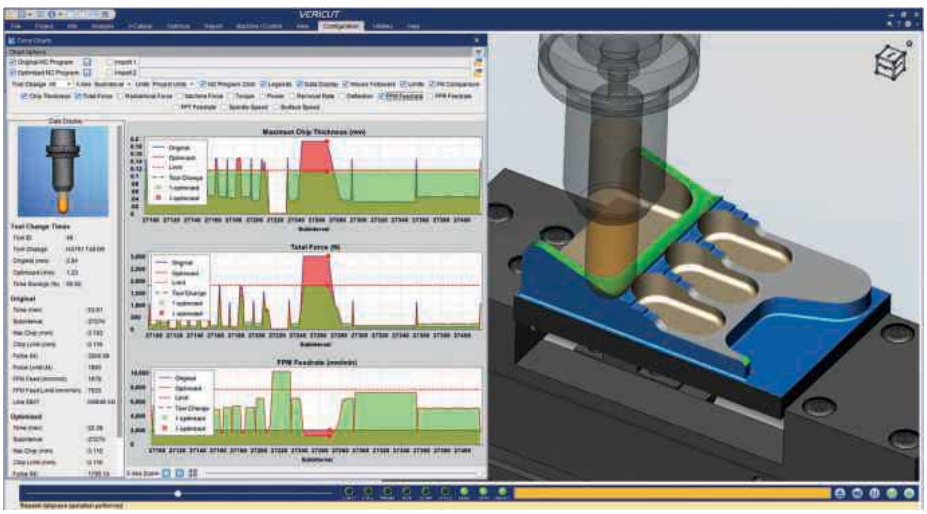
Why use Force?
It is by far the best optimisation solution on the market. Force makes the most effective NC program for the given material, cutting tool, and machining conditions. The results are significant time savings and improved cutting tool and machine life. Machining improvements are a balance between tool life and speed. Force optimisation provides the flexibility to tip the scales to match your machining goals.

How can these benefits help my machine shop?
The benefits of Force include better cutting tool and machine performance, enabling increased capacity without adding another machine and have greater confidence when running lights-out machining that high tool load spikes will not break and tool and scrap a part. Improved part finishes and, of course, better and more consistent tool life are other main benefits, all this ensures reduced cycle times, faster delivery and improved margins to ultimately make you more competitive.

How can I calculate my expected savings?
Most users see a return on their investment in just three to six months. Some of our customers have paid for VERICUT Force on their first optimised project. We have a handy Force Calculator on our website so you can estimate for yourself what Force could save you.

How does Force make my parts cut faster?
VERICUT Force maximises the chip thickness, keeps it constant and matches the cutting conditions to the cutting tools performance parameters all while protecting the cutting from excessive Force, feed rates and spindle power requirements.

How easy is Force to use?
Easier than any other type of NC program optimisation process. User knowledge or software tests are not necessary. Force can optimise every material, on any milling or turning machine tool, with any cutting tool, using any NC program, whether it's newly created or old. We have successfully Force optimised many parts improving them further after they had already been optimised by other methods.



Does Force overwrite the existing NC program
No, it creates a new separate file with a ".opti" extension. Force has a feature to display the original and opti. file side by side. With the Force graphs you can see things like cutting conditions, excessive forces, machining rates, power/torque, chip thickness, material removal, tool deflections and feeds for the original and optimised program.

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Mastercam Multiaxis 2020 improves productivity

Multiaxis machining can dramatically increase a shop's competitiveness. Mastercam Multiaxis is an add-on for Mastercam Mill 3D, Router 3D, Mill-Turn, and Mastercam for SOLIDWORKS®. It improves productivity with simultaneous 4- and 5-axis machining capability for Mastercam. Mastercam Multiaxis offers a wide range of multiaxis machining strategies, both basic and advanced. These toolpaths are also useful for advanced control of 3-axis machines.

Cut Patterns guide the tool along specified paths. These patterns can be simple 2D and 3D wireframe, solid primitives, or complex multisurface grids. Mastercam's Multiaxis machining has many toolpath types to govern the cut pattern.

Mastercam's Tool Axis Control allows orientation of the tool's centre axis to be manipulated as it follows the cut pattern. You have complete and dynamic control over the tool axis, lead/lag, entry/exit, and tilt, which simplifies even the most difficult multiaxis jobs. Full entry and exit control allow you determine exactly where and how the cutter enters and leaves your part. An automatic point generator adds greater precision, as well as advanced gouge checking and a 5-axis safe zone around the part to ensure safe cuts in even the most complex operations.

When programming 5-axis parts, it is often necessary to come very close to the part or fixture with the cutter, arbor, or the holder. Mastercam gives you "near miss tolerance" fields so you can specify how close you are willing to get with any part of the tool and how to avoid those situations.

Mastercam's Blade Expert Add-On greatly simplifies the toolpath creation process for any multibladed parts, including fans, propellers, impellers, turbines, marine screws and more. Blade Expert is a very powerful and easy-to-use custom application, designed to generate efficient, smooth and gouge-free toolpaths for these complex bladed parts.

Mastercam's Port Expert Add-On creates accurate, efficient engine cylinder head porting toolpaths on port surface or solid data. The Port Expert toolpaths use 3-axis machining as far into the port as possible, and then convert automatically to 5-axis motion with minimum tilt. This avoids fishtails or inefficient reverse moves, and smoothly transitions where the toolpaths meet at the middle of the port.

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www.mastercam.com/solutions/multiaxis/

Optimise your machining process with Tebis

Best practice for CNC process, standardisation and CAM automation

While Tebis is well known as a premium CADCAM and MES software company offering advanced solutions for model, pattern, die and mould making, as well as component manufacturing, it also helps customers standardise their CNC processes and to automate their CAM work.

Joe Zhou, managing director at Tebis UK explains: "Manufacturing process should be consistent and reliable. This is where Tebis can help companies by standardising their CNC processes and automating their CAM work. The best practise of a company can be built into Tebis library database, which can then be shared and reused for daily operations. This will help to optimise uses of machine capacities and cutting tools, as well as to optimise the machining processes and machining parameters." Tebis works together with customers to define goals and to achieve them, with experiences of hundreds of projects done worldwide. For the outstanding work in this area, Tebis won Top Consultancy Awards in Germany for both 2017 and 2018.

Tebis CADCAM software provides five database libraries to store manufacturing information: virtual machines with clamping devices, cutting tools with advanced machining parameters grouped for different materials and different machines, geometric features associated with machining features, machining cycles and machining processes.

Joe Zhou also states: "Tebis is very advanced, comparing to most CAM packages, which utilises colour scheme and layer information to match CNC machining processes to automate CAM work." The libraries contain standardised processes for fast programming times through automation while also ensuring consistent quality. Traditionally, CNC machining processes are programmed by CAM engineers with interactive operations of CAM software. While this requires highly skilled CAM engineers, CNC machining processes are dependent on individual CAM engineers and the machining results may vary from one to another.

Tebis CADCAM software not only provides five database libraries to store best practice machining data but also provides advanced tools to manage the database libraries. Joe Zhou clarifies: "The data libraries are usually stored on the company computer network cloud, managed by system administrators and utilised by individual CAM engineers for daily operations." This means that individual CAM engineer can automatically use any updated manufacturing data. This is especially helpful when there are many engineers who work different shifts or at different locations.

He concludes: "The benefits of having these five libraries are to ensure consistent high quality results by optimising and standardising the manufacturing process. By adopting CAM automation, work pressure will be reduced along with CNC and CAM work costs. CAM automation also helps to reduce new CAM engineers' learning curve and relieves skills shortage."

To find out more, please get in touch with Tebis to arrange a demonstration:

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ModuleWorks and TOPSOLID collaborate on 5-axis machining

ModuleWorks and TOPSOLID have signed a partnership agreement that enables TopSolid to use ModuleWorks 5-axis machining components to speed up its software development and enhance the performance and functionality of its 5-axis solutions.

Integrated into the TopSolid solution, the ModuleWorks 5-axis components enable TopSolid to offer the full range of roughing and finishing toolpath cycles for complex mill applications, including performance-optimised and fully-automated cycles for multiblade parts. The ModuleWorks components are designed for fast and seamless integration which helps TOPSOLID to accelerate product development and deployment. The TopSolid 5-axis solution with integrated ModuleWorks technology will be available in 2020 for selected TopSolid users and is scheduled for general release in 2021.

ModuleWorks 5-axis toolpaths for multiblade parts

"We strive to ensure our customers are always a step ahead with the latest features and technology," explains Patrice Tiberi, director of products and strategies at TOPSOLID. "ModuleWorks helps us to achieve this because they offer the full range of industry-leading components that can be quickly integrated into our solutions. This not only accelerates our time to market, but also reduces our development costs."

Motorcycle engine designed and manufactured using TopSolid

"We are delighted to work together with TOPSOLID," says Heiko Weber, head of digital manufacturing at ModuleWorks. "It's great to see how our software solutions take TOPSOLID a step further in their strategy to deliver an innovative, comprehensive and unique portfolio for the various manufacturing industries. We look forward to a continued and successful cooperation."

ModuleWorks is a leading software component provider for the digital manufacturing industry. ModuleWorks' expertise in toolpath creation and simulation is recognised throughout the

industry and its software components are already optimising the performance and quality of over 500,000 installed seats of CADCAM and CNC software around the world. From standard products to exclusive development projects, it works in close cooperation with you to bring your own vision of Industry 4.0 to life. Its comprehensive product portfolio and cutting-edge software components enable you to optimise your CADCAM solutions and connect to CNC/MTB systems to increase your competitiveness and help you Get There Faster.

ModuleWorks GmbH
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Tailored to your needs

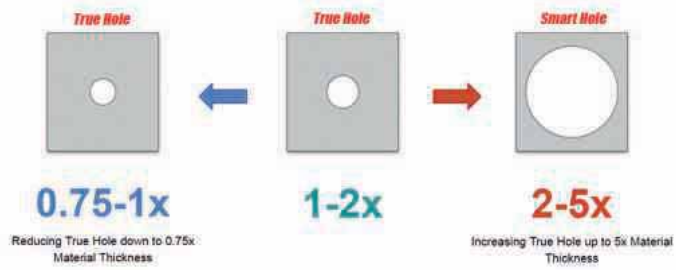
Procut CADCAM is a cutting software that has been designed and developed in-house by Esprit since 1986 and it incorporates the knowledge and experience that only a machine manufacturer can accrue.

The experience gained from designing, manufacturing and supporting a wide range of CNC cutting machines helped us to produce informed software applications that will allow you achieve the very best results from your machine investments.

Procut CAD/CAM software has been designed specifically for flatbed cutting applications and in addition to plasma and flame cutting.

True Hole technology guarantees excellent hole quality with hole diameter to thickness ratios from 1:1 to 2:1 The Procut software developers then created Smart Hole Technology to allow you to produce holes down to 0.75:1 and up to 5.1. This allows you to produce fantastic bolt ready holes across a far greater range of diameters than anyone else, giving market leading cut quality.

Procut has been designed specifically for flat bed cutting



applications and in addition to plasma and flame cutting it supports selected laser and waterjet machines.

Procut CADCAM software has comprehensive drawing facilities, flexible CAD import capabilities and powerful automatic and interactive nesting systems. Integrated plasma marking module, 3D shape development, and many other options can be specified to tailor the Procut system for any flatbed cutting application. Check the feature overview table below, and Esprit will advise you in tailoring your Procut CADCAM software to your specific needs.

The new ribbon interface makes Procut even easier to use. Simple to navigate and intuitive to use, the new interface improves workflow and saves you time, with powerful features only a few clicks away.

Procut supports not only Hypertherm CNC but it supports a vast array of different CNC brands.

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Projecting a quality image

Within the demanding marine sector, the accurate positioning, alignment and assembly of components, especially larger, cumbersome elements such as boats' hulls, is a regular and often challenging requirement. Famous superyacht builder Sunseeker has eliminated the difficulties associated with these tasks following the recent purchase of two complementary, laser based technologies from FARO UK. The cutting-edge FARO products have enabled Sunseeker to significantly reduce its build times and to further develop the company's renowned quality standards.

Examples of Sunseeker's celebrated luxury yachts can be found throughout the world's seas and harbours. Characterised by their stunning appearance, superb levels of luxury and outstanding performance, the famous company's boats are a product of Sunseeker's progressive design capabilities, the application of first-class craftsmanship and the use of advanced materials and technologies.

In order to remain at the technical cutting-edge of the boat building industry, the Poole, Dorset-based company's management continuously searches for innovative new production and inspection aids. For example, given his extensive Indy-Car and Formula 1 design experience, Sunseeker composite development manager, Stuart Jones, was aware of the many advantages FARO's laser based technologies deliver across various classes of global motorsport. Therefore, he was confident that FARO products could

provide Sunseeker with improved levels of speed and precision throughout all stages of each boat's build. A successful on-site demonstration of a FARO Laser Tracker and a FARO Laser Projection System validated Stuart Jones' opinion.

Put through its paces in the presence of a group of relevant Sunseeker staff, the advanced FARO equipment was able to prove its impressive accuracy and remarkable ease and speed -of-use. As the demonstration verified the FARO systems' ability to considerably reduce boat build times, a rapid return on investment was calculated and an order was placed for a FARO VantageE Laser Tracker, four FARO TracerM Laser Projectors and FARO's CAM2 software.

Now in daily use across a wide variety of tasks, as anticipated, Sunseeker's advanced new FARO products are making a major contribution to the precision and efficiency of the company's boat building activities.

Stuart Jones explains the use of the company's new FARO Vantage Laser Tracker: "Having previously utilised conventional, time-consuming means of measurement and inspection, we have made a quantum leap by using our advanced new FARO Vantage Laser Tracker. We are now able to rapidly and accurately capture the 3D base geometry of, for example, our superyacht hulls and our large composite components to ensure that they adhere to the designs generated with the help of our in-house design and manufacturing software. Once obtained, this data is then used by our four new FARO Laser Projectors to project a variety of key datums, templates and location positions onto our hulls, allowing the precise fitting of key components during build.

"Having successfully applied it to capturing the base geometry of hulls and large composite components, the ease-of-use, accuracy and flexibility of our FARO Vantage Laser Tracker, meant that within days of its delivery, we discovered a multitude of other uses for it. For instance, we found that, as it was an extremely precise and effective coordinate measurement system, we could use it to accurately compare many other key components against their original software models. Also, because of its relatively low weight, portability and robust construction, we are now able to bring our FARO Vantage Laser Tracker to our suppliers to assist in problem identification and to then take the relevant rectification measures.

"As many of our parts have extremely tight tolerances, our tracker routines allow us to accurately detect and quantify any deflection or change in the geometrical shape of components such as hulls that could cause later assembly issues. The use of the precise data gathered by our Vantage Laser Tracker means that we are able to take early corrective actions and avoid more problematic issues later in the build process."

FARO Vantage Laser Tracker

Ideal for large-scale 3D measurement applications, FARO's Vantage is a high-performance laser tracker that enable users to maximise productivity and reduce inspection cycle times by 50 to 75 percent. The advanced metrology solution significantly increases precision and speed across a range of applications including, assembly, alignment, part inspection, machine installation and reverse engineering.

Compact, portable and robust, the FARO Vantage offers an array of class-leading features, including ActiveSeek™ technology that allows the laser trackers to find and follow the target, even after the user passes behind obstructions. In addition, the widest field of view in the industry gives the user complete freedom to move throughout a large measurement envelope.

FARO's 6th generation integrated Absolute Distance Measurement System

(iADM) ensures exceptional accuracy. With a data output rate of 1,000 points per second, the Vantage provides feedback for high-speed motion control and high-density scanning making it ideal for automated applications.

The Vantage S and E series Laser Trackers are the only portable CMM machines that measures angle and distances with a single, Class 1 eye-safe laser. Measurement reliability is improved as errors and drift associated with two-beam tracker technology are eliminated.

Stuart Jones continues: "Having identified several key potential applications for FARO's TracerM, an impressive practical demonstration of the laser projection system operating in these areas proved its high-precision and speed capabilities.

"We now use our Tracer Laser Projectors to project precise, virtual templates that enable datums to be marked. This process allows the very accurate location of critical components such as bulkheads, longitudinal elements, stringers and engine beds. The benefit of the use of the FARO projections are that we are able to quickly and accurately complete the 'right-first-tine' positioning of these important features in all three dimensions. The precision we achieve in establishing an accurate, solid base at this stage of a boat's build provides many benefits later in the process.

"In addition to the accuracy benefits our TracerM's have delivered to our build procedures, they have significantly reduced our build times. The installation of wire-looms located on our deck liners is a typical example of the time savings we have achieved. Previously two people would have

manually marked out the cable routes with a tape measure and marked their routes with marker pens, returning later to then fit the looms in situ. Now, our TracerM's projects our wire-loom design model onto the deck liner surface and the cable mounts and looms are then fitted in one rapid, accurate procedure.

"The fitting of our liners, which had previously been a bottleneck in the build, were subsequently reduced by two days. Additionaly, the use of our laser projectors has been instrumental in avoiding problems such as cable pinching during final assembly."

FARO TracerM Laser Projector

FARO launched the ingenious TracerM laser projection system with the intentions of removing the need for physical templates, increasing users' precision capabilities, eliminating the risk of human errors and reducing the expensive delays associated with the alignment and assembly of large components.

FARO's TracerM uses customers' existing 3D CAD models to projects a 0.5 mm wide laser line onto a 2D or 3D target surface or object, creating an extremely accurate virtual template that enables the fast, accurate positioning of components with absolute confidence. Users are able to rapidly create virtual and collaborative 3D templates that help to streamline assembly and production applications, improve productivity and enhance quality functions.

The ingenious system features precise, variable and long-range projection capabilities that cover an envelope of up to 15.2 x 15.2 m. For larger assemblies and for use in space-constrained areas, multiple TracerM projectors can be controlled from a single workstation to provide large-scale virtual templates within a single coordinate system.

Advanced Trajectory Control (ATC) is used by the TracerM to deliver fast projections. ATC provides superior dynamic accuracy and a rapid refresh rate which minimises flicker.

The TracerM uses BuildIT Projector, an easy to use, intuitive software solution that is able to be operated by both knowledgeable and less inexperienced staff. BuildIT Projector is able to import native CAD from all major formats including CATIA, Siemens NX, SolidWorks, PTC Creo, AutoCAD DXF/DWG. The software's capabilities cover the creation of the projections together with the configuration and operation of the projectors and their alignment features.

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Measuring for success

Revolutionising quality control in manufacturing

Lengthy measurement routines can be frustrating and monotonous for workers tasked with carrying out such quality control tests on a daily basis. Thus, reducing measurement time without compromising product quality is a critical factor in the continuous improvement of any given manufacturing process.

This is why in May 2019, Vision Engineering prioritised the design and production of a large capacity 3-axis CNC video measurement system. The LVC400 is a fully automated 3-axis video measurement system with the power and flexibility to meet the most demanding requirements. It is ideal for measuring large components or multiple small components quickly, easily and accurately.

Of course, large components can take a long time to measure on manually operated measuring systems, which is why the LVC400 is equipped with a motorised measuring stage and motorised zoom lens to automate the movement of the system and reduce measurement time as well as discomfort to operators.

What's more, the LVC400 can be used to speed up measurement of smaller components. The palletising feature enables operators to load multiple small components onto the large measurement stage of LVC400 and measure the whole lot in one programme, saving valuable time.

Further increasing measurement speed, magnification changes can be built into measurement programmes for non-stop measurement routines. When discussing the main items of consideration when implementing a new measurement system or technologically advanced tool, professionals in the manufacturing space often look for the same general qualities, ease-of-use and high quality.

Therefore, measurement equipment, such as the LVC400, won't do well just because it looks good on paper. It has to perform well and consistently in a real-life manufacturing environments.

Ease-of-use

LVC400 is supplied with highly intuitive M3 software. This offers a rich suite of measurement functions, while maintaining the ease-of-use that Vision Engineering is known for.

M3's key features include easy reporting and data export, DXF overlays as well as fitting and thread measurement.

The intuitive nature of the software means that there is no longer the need to rely on a single highly skilled operator to set up measurement programmes. Now multiple members of a production team can programme automatic measurement routines as a matter of course. This de-skilling of the automation process greatly improves the speed of production.

Highly accurate

The LVC400, with its granite base for extra stability and precision stage, is the most accurate large format measuring system to date from Vision Engineering. The multi-sensor system allows automatic switching to a touch probe option within the same measuring programme offering a seamless change from contact to non-contact measuring.

A perfect example of how this is useful would be in the case of black moulded plastic components. The outer angles and diameter would be measured via the non-contact method. Then for internal diameter and component features which would show up as 'black on black' under the camera, the routine would switch to the contact measurement option to ensure measurement accuracy wasn't compromised due to poor edge detection.

Vision Engineering Ltd is a global leading-edge manufacturer of unique ergonomic stereo microscopes and non-contact measuring systems. Since its formation in 1958, it has become one of the world's most innovative and dynamic microscope manufacturers, with offices across Europe, Asia and North America, as well as a fully trained global distribution network.

Renowned for pioneering optical design, Vision Engineering's microscope and metrology systems perform to the highest standards, often exceeding customer expectations.

Designed in Britain, Vision Engineering's hightech UK and USA manufacturing facilities ensure its customers benefit from high quality solutions. The company is now sharing its expertise offering contract design and manufacturing service, from product design, prototyping, manufacture, assembly, logistics to commercialisation of precision optical and mechanical products and instruments.

Customers value the high quality of Vision Engineering's inspection and measurement systems that have been proven in the most demanding applications. Extensive quality management processes enable the company to measure and maintain the highest levels of quality across the company. An approved supplier performance scheme ensures this quality is maintained throughout its supply chain partners.

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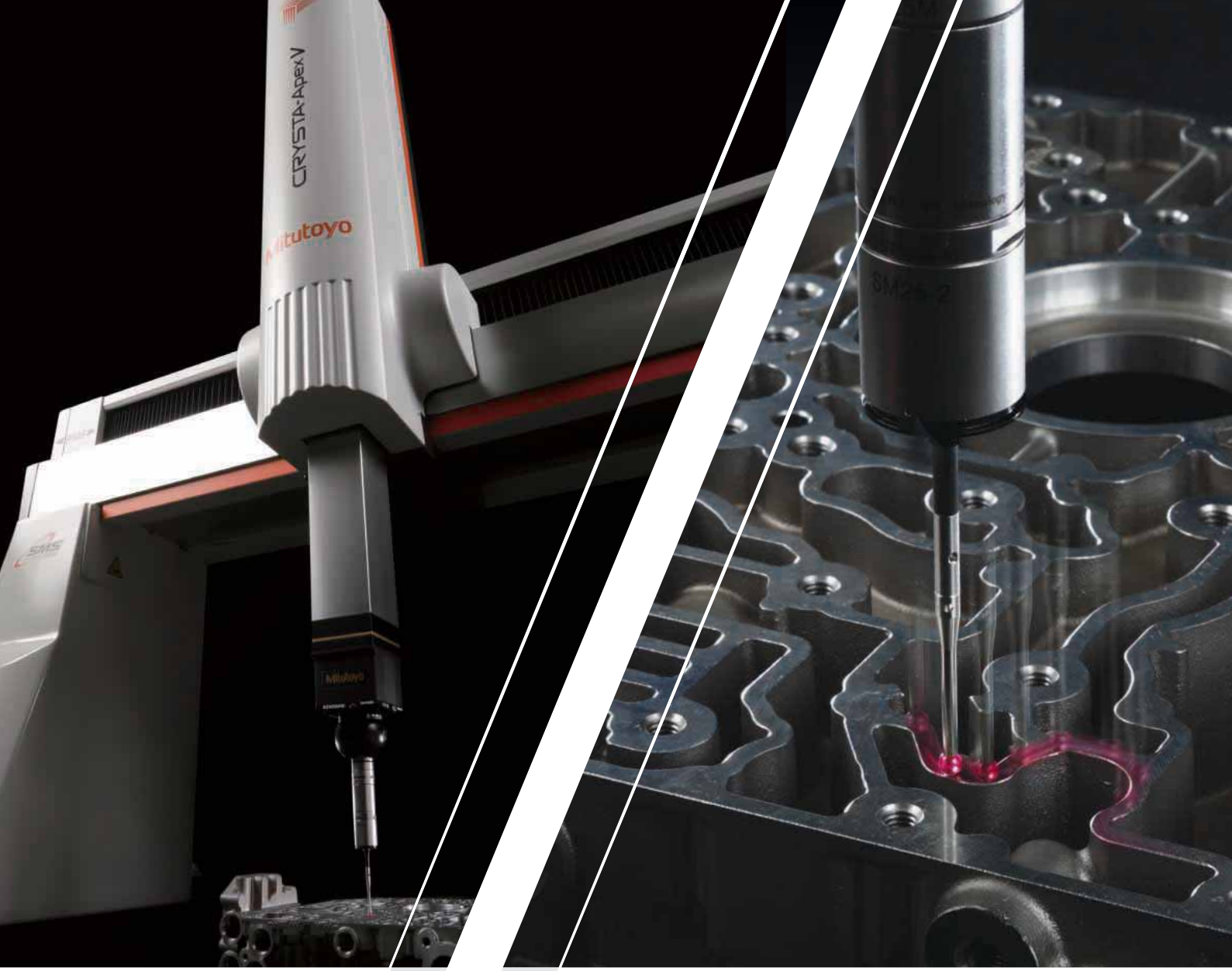


NEW Products

Mitutoyo

A smart-factory-ready CMM for the production line

Designed with the future of shop-floor measurement in mind, our CRYSTA-Apex V Series CMM delivers faster measurement without compromising the measuring machine's inherent accuracy, helping make the smart factory a reality.

This advanced machine provides a performance specification unmatched by any previous CMM of this class over the wide temperature range of 16-26°C. This allows for the automation of in-line and near-line measurements within the manufacturing process to significantly reduce measurement time and streamline the workflow to enable faster line speeds.

Your shop floor measurement begins and ends with us. For more information visit: **www.mitutoyo.co.uk**

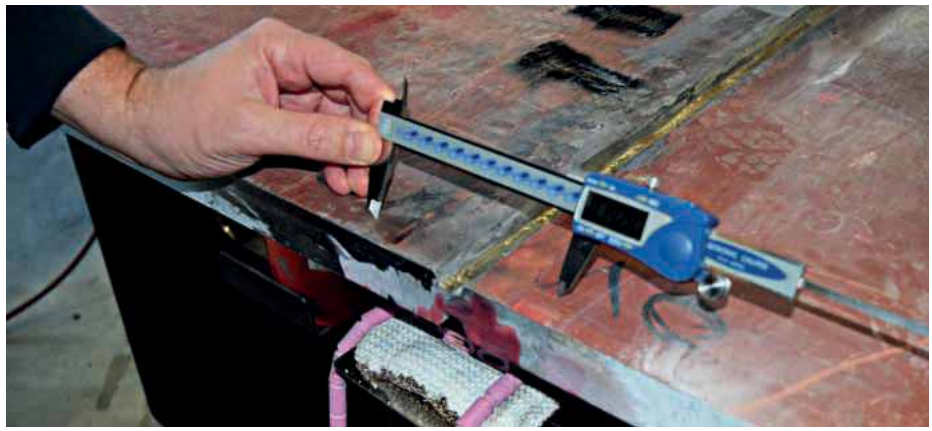
40 1980 2020 YEARS ANNIVERSARY MITUTOYO UK

Nuclear AMRC relies on Moore & Wright for critical weld shrinkage measurements

The welding team at the Nuclear AMRC is using a Moore & Wright caliper to accurately measure weld shrinkage on nuclear components. Measurements are carried out as part of Time of Flight Diffraction (TOFD) testing, an advanced non-destructive testing method widely used for weld inspection using ultrasonic probes.

John Crossley M.InstNDT, NDT technology lead at the Nuclear AMRC says: "We use the Moore & Wright IP54 water resistant calipers to measure weld shrinkage simply because they are the best tools for the job. All of the shop floor welding team use the caliper on a daily basis when welding; it's perfect for the job, easy to use, and provides good accuracy. We also ensure that the accuracy is maintained by carrying out regular in-house calibration to traceable UKAS standards."

Weld shrinkage must be carefully monitored and accurately measured as distortion of the weldment is commonplace during the expansion and contraction of the weld metal during the welding process. Monitoring weld shrinkage is particularly important because it has a direct effect on residual stress in the weld, which can increase susceptibility to failure through corrosion fatigue, stress corrosion cracking and fracture. Each measurement is logged by the Nuclear AMRC, and parameters for tolerances strictly met in order for the part to be accepted.



The Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC) helps UK manufacturers win work across the nuclear sector. Located on the Advanced Manufacturing Park (AMP) in South Yorkshire, on the border of Sheffield and Rotherham, the centre's manufacturing innovation capabilities and supply chain development services are open to all UK manufacturers, from specialist SMEs to top-tier OEMs.

There are many key components within a nuclear power plant that are manufactured by joining together large sub-components in a way that is resistant to corrosion, and that maintain material integrity under extreme conditions whilst in service. The welding research and development team at the Nuclear AMRC develops advanced and innovative joining and cladding techniques tailored to the nuclear industry, where extremely high levels of quality and assurances are required.

Welded joints between thick-walled nuclear components often require over 100 weld passes using standard techniques, which is understandably a complex task on such a large scale. In addition, the repeated heating and cooling that the joints are exposed to can have significant effects on the properties of the material around the joint, potentially harming the long-term performance of the component.

Ensuring the overall performance of the weld in service is absolutely critical, meaning that the welding team at the Nuclear AMRC is required to identify any discontinuities in the welding profile, including careful measurement of weld shrinkage. This careful evaluation of the weld will determine acceptance or rejection depending on the required criteria.

The quality of joints and the surface thickness of nuclear components must be specified for fracture mechanic properties. As these components are typically make up steam generator pipes and high-pressure feed line pipes, they must meet extremely tight tolerances in order to be acceptable for use in these critical environments.

John Crossley states: "The accurate measurement of weld shrinkage is really important to the work we do at the Nuclear AMRC. We carry out welding work for nuclear, offshore and oil and gas applications, all of which require the highest levels of quality due to extreme conditions and safety considerations."

Engineers and specialists at the Nuclear AMRC work directly with companies to develop innovative techniques and optimised processes for large-scale high-precision manufacturing. The centre also provides a range of supply chain development support to help manufacturers enter the nuclear market and compete worldwide.

The Nuclear AMRC is owned by the University of Sheffield, and is backed by industry leaders and government, forming part of a world-leading innovation cluster alongside the AMRC, Castings Technology International and AMRC Training Centre.

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The 'Apex' of Mitutoyo precision for Qualiturn

Hertford-based Qualiturn Products Ltd is a perfect example of the productivity increases that can be achieved by the application of advanced IT systems, the use of high-yield machine tools and the adoption of cutting-edge automation technology. In addition to performing day-time manufacturing, the business' highly efficient working practices allow it to operate 'lights-out' throughout each night. Qualiturn has achieved a genuine 'virtuous circle'. The company's application of advanced manufacturing techniques has enabled it to realise world-class levels of production efficiencies. These efficiencies have allowed the business to supply very competitive quotes that have resulted in further profitable business. The profits generated have supported further investments in ever more advanced manufacturing technologies.

In addition to earning an excellent reputation for efficiency, another important aspect of Qualiturn's values can be found in the company's title. Qualiturn's quality philosophy is reflected in all aspects of its activities. Although, as often happens to business' that achieve substantial upturns in production, the increased amount of Qualiturn parts needing final inspection, began to place a strain on the company's quality control provision.

To ensure the continued efficient operation of the business' inspection department, Qualiturn's managing director, Nick Groom recently undertook a search for a Coordinate Measuring Machine (CMM) that had a precision specification that would enable the inspection of parts with demanding dimensional tolerances. Also, given the high volumes of components that need to be inspected, a fast operating, CNC driven machine, with a granite table that could accommodate multiple components, was required.

Having studied the available alternatives, as it met all of his criteria, he purchased a 500 mm x 700 mm x 400 mm X, Y, Z capacity version of Mitutoyo's recently launched Crysta Apex V series CMM. As a result of increased acceleration, faster travel and improved accuracy specifications, the advanced new Crysta Apex V series CMMs are able to accomplish significantly more component measuring cycles in each working day and also deliver higher levels of precision.

Explaining Qualiturn's quality ethos and his recent Mitutoyo CMM purchase, Nick Groom says: "We are a BS EN ISO 9001: 2015 registered business and we see efficiency and quality as the same thing. For instance, the right-first-time production of quality parts is efficient, whereas the manufacture of poor quality parts that require rework is inefficient.

"Having recently searched for a suitably accurate and fast acting CMM, when compared to the alternatives that I considered, I was impressed with the abilities of Mitutoyo's new Crysta Apex V series machines and was happy to place an order.

"Now installed and up and running, following a short operator training session, our staff soon mastered the new CMM's logical software and controls. As well as having the levels of precision that allow the inspection of our most demanding parts, our Crysta Apex V series CMM has the speed of operation that we need and it has significantly increased our inspection efficiency levels.

"Now, prior to a production run, when writing a program for our machine tools, we use this model to also generate an inspection program for our new Mitutoyo CMM. This means that when manufacturing commences, we can load the relevant program onto our new CMM and quickly verify the first-off part. Then, throughout the production run, our quality staff are able to load large batches of parts onto the CMMs

bed and start a fully automated, un-maned inspection routine.

"The impressive performance of our new Mitutoyo Crysta Apex V series CMM means that, not only has it satisfied our current inspection requirements, but it should also be able to meet all of our future anticipated inspection needs."

Drawing on its technological expertise in the field of CMM design and manufacture, Mitutoyo recently launched the CRYSTA-Apex V Series of high-accuracy CNC Coordinate Measuring Machines. The new CMMs have a proven bridge-type construction, they feature high-rigidity air-bearing guiding on every axis and use Mitutoyo's world-renowned ABS scales.

As the successor to the previous generation of CRYSTA Apex CMMs, the new models build on the merits of their globally popular predecessors. In addition to boasting impressive accuracy specifications, the new Mitutoyo models have rapid acceleration and fast speed characteristics. Not only do these qualities allow the inspection of components with challenging dimensional specifications, when compared to other less able machines, they increase business' efficiency levels by enabling more components to be inspected in a given time.

Increasingly, businesses are looking to measure parts closer to their means of manufacture, therefore, besides being ideal for use in inspection departments, CRYSTA-Apex V Series CMMs have a high level of resistance to environmental conditions and are perfectly at home in less than ideal production environments. Further aiding shop-floor use, the new CMMs are equipped with an automatic temperature compensation feature.

As a result of Mitutoyo's flexible CMM concept, the new CRYSTA-Apex V Series represents a genuine future-proof investment. In addition to handling users' current inspection needs, thanks to the ability to change or add probe systems, accessories and software, the new CMMs are capable of adapting to future requirements.

Given the advent of Smart Factories and the arrival Internet of Things (IoT), the advanced CRYSTA-Apex V Series CMMs are equipped with Mitutoyo's Smart Measuring System (SMS) technology. SMS allows the

online monitoring of the CMMs' operational status and the capture of records related to key parts.

Moving forward, Mitutoyo will drive the installation of SMS technology, not only in CNC CMMs, but also in other CNC measuring instruments. Leveraging IoT, Mitutoyo will support the realisation of smart factories that conduct the sophisticated management of information relating to production and quality.

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GF Machining Solutions offers a complete AM solution for medical device manufacturers

Metal Additive Manufacturing (AM), also known as metal AM or 3D metal printing, is becoming a driving force in the production of many of today's medical devices. In fact, orthopaedic implants with porous surfaces and lattice structures mimicking the behaviour of normal bone, have led to significant improvements in patient outcomes and implants with these features simply cannot be made without AM.

Moreover, it is not just implants that have new designs; surgical tools and instruments too also benefit from simplified manufacturing processes, weight savings and ergonomic features that can only be made with AM.

Not surprisingly, it is estimated that as much as 10 percent of all orthopaedic implants being introduced have at least one component made by AM.

However, starting a new department for AM carries many challenges. As metal AM grows in importance, Original Equipment Manufacturers (OEMs) and Contract Manufacturing Organisations (CMOs) of all sizes are investigating how to best integrate this technology in order to better meet their customers' needs.

With a complete "end-to-end" solution that brings customers best-in-class quality together with lowest running costs, GF Machining Solutions and 3D Systems recently launched the DMP Flex 350 to help ensure success when adopting this new technology.

The technology

There are various technologies for printing metals, but the dominant approach today creates solid material through the targeted melting of very fine metal powder. DMP Factory and Flex systems from GF Machining Solutions and 3D Systems use a laser-based process, selective laser melting, which can produce high-quality surface finishes and small features down to 0.1 mm.

A key consideration when investigating metal AM technologies is the range of materials the respective systems can print, as well as the ability and speed to change, or not change, materials if necessary.

For example, surgical instruments are most often made of stainless steel, while surgical implants usually require titanium. If the manufacturing objective or priority is to fully load a 3D printer with different types of jobs, a flexible system allowing efficient material changes will be your natural choice.

The DMP Flex 350 has been engineered to allow a user to change the metal being printed in only a few hours. On the other hand, the DMP Factory series is designed for use with a single metal.

With the DMP Factory and a DMP Flex versions of the system, manufacturers can invest in the technology that is right for them.

Innovation

When it comes to 3D metal printing, oxygen is the enemy. When metals such as titanium are in its presence, they degrade through oxygen uptake. Our system's unique design makes use of a sealed build chamber to create the optimal printing environment by evacuating all air from the chamber and replacing it with argon. This cycle is repeated three times before the build begins, removing both oxygen and any trace of humidity from both the chamber and the powder reservoir.

With this unique approach, the oxygen level present during operations is around 25 ppm, compared to 300 to 700 ppm of oxygen in other systems' build chambers, which most often have a continuous flow of argon entering the chamber. The results with our system are better and more consistent product quality, build after build and lower operating costs through both reduced argon consumption and a longer useful life for the metal powder.

A complete solution

Even with its many advantages, the DMP Flex 350 is just one part of the metal AM printing puzzle. Success also requires a product design adapted for 3D printing, a validated process, and the ability to integrate downstream operations. GF Machining Solutions and 3D Systems provide a full range of technologies, including both machines and automation systems for downstream processing.

One of the keys to GF Machining Solutions' approach is the use of System 3R pallets as a base within the DMP Flex 350. Printed products can be transferred to secondary processing, such as milling, without the need for re-clamping or re-referencing and with product manufacturing data secured via System 3R's radio frequency identification (RFID) chip.

GF Machining Solutions and 3D Systems have also introduced a wire-cutting Electrical Discharge Machining (EDM) system designed specifically for AM: The AgieCharmilles CUT AM 500 is unique in that it allows removal of product from the build plate cleanly and without cutting forces.

A software solution

Taking a product from idea to design 3D print requires both experience and the appropriate software. Three-dimensional printing is a vertical process: The powder

present in the bed cannot support the weight of the printed metal, so designs must be adapted to include support structures which can also prevent deformation due to thermal stresses arising during the melting process.

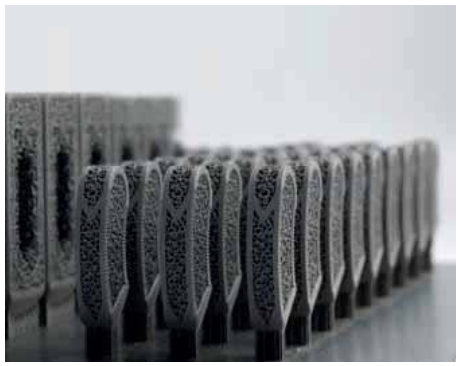
Build simulation software allows for the verification of the size and geometry of support structures. At the same time, training and design experience are also valuable assets. 3DXpert® software offers simulation tools that consider wall thicknesses, weight and powder behaviour to ensure that supports are minimised and not obstructive, but still of sufficient size and strength to do their job.

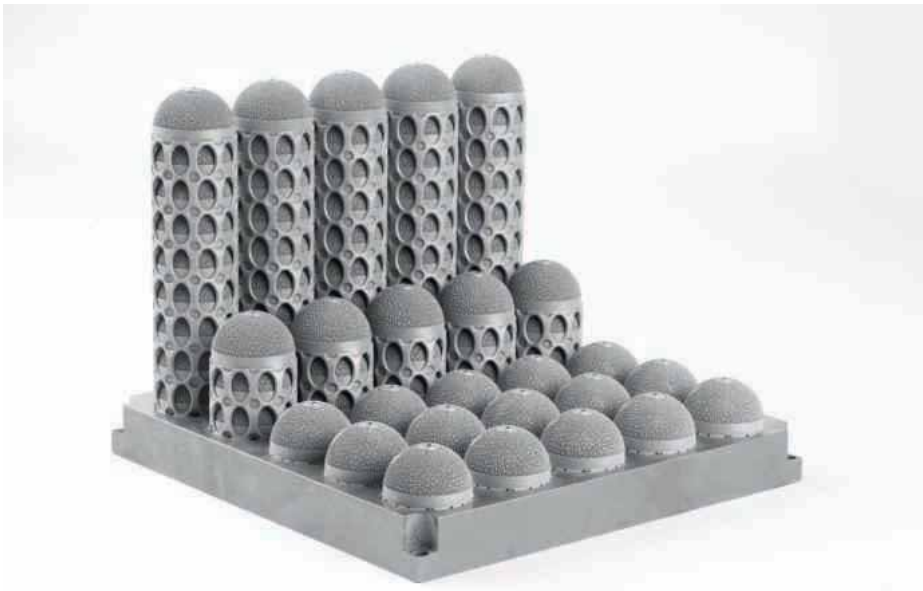
As an advanced software package, 3DXpert also links the printer design, its Laser, and its powder characteristics. The result is a printing process that optimises the Laser path and build strategy to ensure that the desired mechanical properties of the product can be achieved. 3DXpert is the key to both product design and defining the optimal printing strategy; it is a complete solution from CAD to the finished product.

Qualification and validation

In highly regulated, risk-averse sectors like medical device manufacturing, qualification and validation can represent big hurdles for a manufacturer. A validated AM process includes the entire ecosystem, from quality control processes for incoming powder to software, post-processing and process controls on finished products.

Companies looking to bring AM into their production portfolio should carefully consider which supplier/partner has the level of experience and expertise. As experts in metal AM as well as a broad range of other manufacturing technologies and with expert customer training and first-class customer services and support, GF Machining Solutions and 3D Systems are uniquely qualified to help manufacturers integrate AM into a factory and master every step, from machine installation to manufacturing of AM devices.





Summary

The products you plan to make will inform your choice of printing technology and the make and model of your printer will increase, or limit, your flexibility in terms of materials and the products that can be made. The technology you use and the printer design you select will also drive your running costs up or down and influence the quality of the products you make. In the final analysis, oxygen management in the system you choose will likely be the single biggest driver of both your running costs and your product quality and it should be high on list of priorities when you are deciding which system to purchase.

Managing the changes metal AM brings to product design and understanding validation of the complete value chain, including post-processing steps, are also key. Training your staff or hiring people with relevant experience and adapting your internal processes are also important starting points.

As 3D printing continues to cement its place in medical device manufacturing, GF Machining Solutions and 3D Systems bring together the elements essential to your streamlined integration of the technology while delivering not only the system with the lowest running costs but an end-to-end solution that includes powder, software, expert application support, operator training, and customer services.

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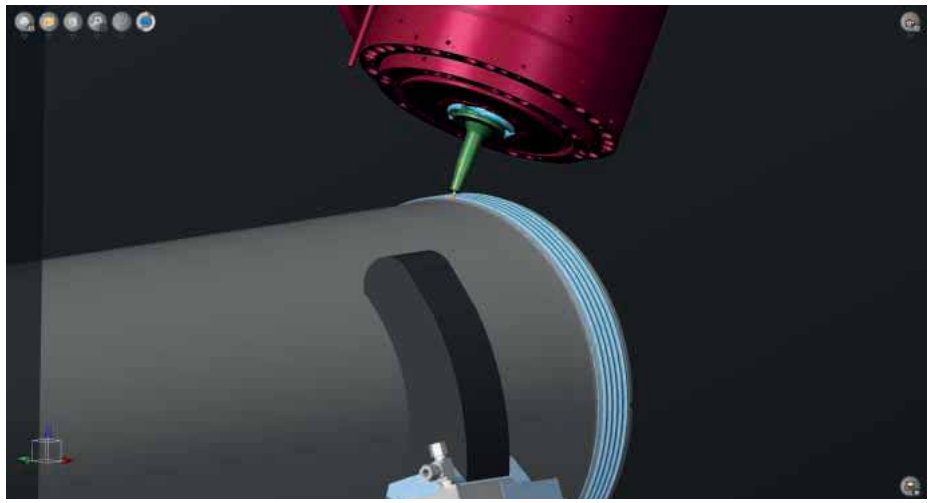
Productivity has landed with NCSIMUL

Space tech specialist opts for NCSIMUL simulation over dry runs

July last year marked the 50th anniversary of the first moon landing. Now, space technology and exploration are again coming to the forefront. There are proposed new trips to the moon and perhaps Mars, along with ongoing research at the International Space Station and regular launching of communication and defence satellites.

Despite being a strong contributor to new growth in the high-tech field of space technology, a company manufacturing large, space-related components, often resorted to somewhat low-tech ways of checking for potential collisions on their machine tools.

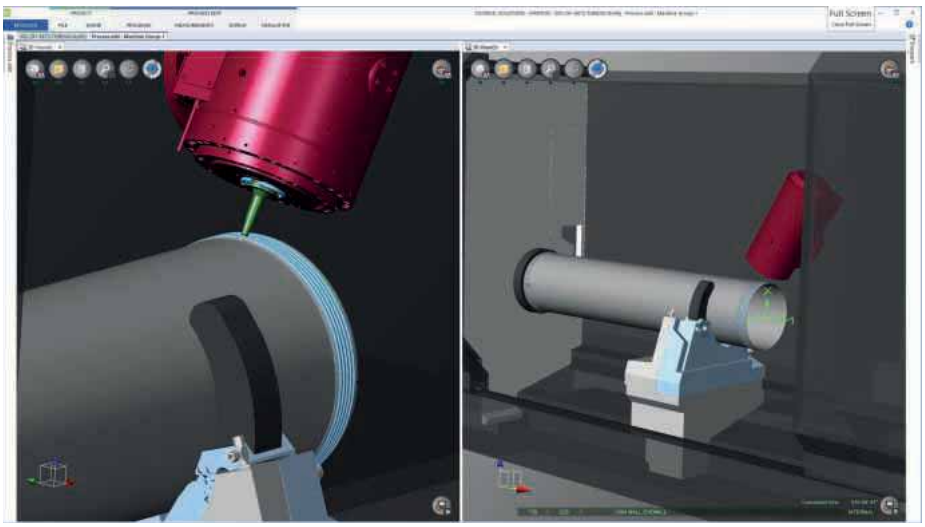


Marton Precision Manufacturing's 5-axis machinist, Miguel Chavez would frequently dry run programs and even climb up into the workshop's gantry mill to physically check. Even then, he says, he didn't always discover a problem until the end of the program: "When that happened, I had to make adjustments and begin the dry-run process again. If the fixtures needed adjusting as well, that meant taking an additional step."

In addition, they used to buy an extra billet of material in case there was a problem during the actual machining process: "Buying an extra block, just in case, gets expensive, especially if it's a particularly large part. And, the repeated dry runs were also expensive in term of time. Depending on how long the program was, it might take up to two days to get it running successfully."

All that changed, though, when they invested in NCSIMUL machine simulation software from Hexagon. This now means he can simulate, verify, optimise and review machine programs, based on the characteristics of the individual parts, cutting tools and the specific CNC machine involved. 3D graphics help him avoid machining crashes, while complex algorithms and embedded process-based knowledge enables cutting conditions to be optimised. Miguel Chavez explains: "The software reduces time I spend on debugging programs and eliminates the risk of spindle collisions, tool breakages and scrap, while improving cycle times and process efficiencies."

One of the largest parts the California-based company produced was on its 5-axis Hwacheon bridge mill. It was a 4.5 m 7050 aluminium aerospace structural component. Migel Chavez adds: "I had it hanging off from one side of the machine whilst working on the other side, then rotated it 180° to machine the rest of it."



The first component that he used NCSIMUL to verify the machine G-code for was on that same machine, with the same metal. He continues: "It was a fuel cell cover with several 5-axis features. Now we use it all the time. We can have a program ready within around two hours instead of between 12 and 16 hours. I can have it adjusted and feel comfortable enough to run it without having to climb up into the machine to have a look. We no longer have to buy an additional back-up piece of material, so it saves us money there, as well as time and gives us complete peace of mind."

Marton Precision now has NCSIMUL packages for eight different CNC machine tools, customised for each machine they are used on. Miguel Chavez continues: "We have an STL model of the machine from the machine tool builder, which includes control information and other parameters; then we send it to NCSIMUL. They then build the software package according to exactly what we have. NCSIMUL looks at the final G-code that will run the machine and if there's an issue with the program I just use the edit mode to make any necessary adjustments."

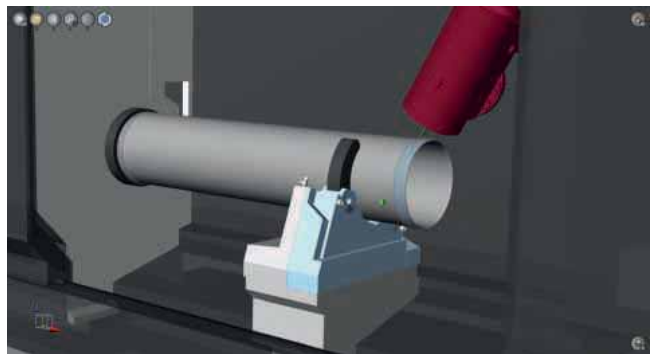
The NCSIMUL Machine module provides machining verification in three steps: it investigates and corrects coding errors; simulates to locate collisions and correct motion errors and validates the machining result: "As well as the toolpath verification, it also takes the machine's interior features

and tool movement patterns into consideration. With NCSIMUL we know we're going to get it right first time, every time."

The company was founded in 1986 by Dan Marton and his wife Mary, originally to manufacture laser eye surgery equipment. Today it focuses on large 5-axis milling and vertical turning, thin wall and high-speed machining and manufacturing services including engineering, assembly, inspection, waterjet and EDM machining as well as metal treatment. Amongst its customers: NASA, Jet Propulsion Laboratory and other large private space companies. In addition to space, satellite and aerospace components, Marton Precision Manufacturing also makes parts for the defence, scientific instrument, medical, oil and gas industries.

Miguel Chavez concludes: "Something new happens here every day. We see the component on paper, get a block of metal and then see the part complete, in real life. That's the beauty of machining and now more moon trips are likely, it's even better."

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



Hexagon's Manufacturing Intelligence division provides solutions that utilise data from design and engineering, production and metrology to make manufacturing smarter.

Its software solutions create a digital thread throughout the manufacturing process, enabling the entire factory to take a holistic view of quality and work together with speed and confidence to achieve the desired outcome. The hardware solutions use metrology to bring real-world physical attributes to the digital thread to improve the accuracy of operations. The digital thread ties together a connected ecosystem for manufacturing and, with the addition of domain expertise and intelligence, enables continuous learning to improve product quality. By placing quality at the heart of the process, we are developing autonomous connected ecosystems for manufacturing, more typically referred to as Smart Factories.

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Dual-laser, powder bed, additive manufacturing machine

Equipped with a pair of 600 W, optionally 1 kW, lasers, the new Lasertec 30 Dual SLM machine expands DMG MORI's portfolio of Additive Manufacturing (AM) equipment and provides an efficient production solution based on the powder bed process. The two lasers in the optics module can build either one component or several workpieces in parallel, providing flexibility to meet different order situations.

The scan field of each laser covers the entire chamber area, enabling build rates of up to 90 cm^3/h and raising output by as much as 80 percent compared with single-laser machines. Active cooling of the build area allows users to remove finished components more quickly and so prepare orders faster, leading to a further increase in productivity.

The software automatically recognises which scan strategy is the most efficient for each job, ensuring that the machine always operates optimally. The adjustable focus diameter of the laser spot from 300 microns down to 50 microns results in high accuracy melting. Another feature is a permanent filter with a lifetime of more than 3,000 hours that, due to automatic passivation of metallic particles, offers a high level of operational safety.

DMG MORI has retained the ergonomic design of the Lasertec SLM series, which provides good accessibility for maintenance and to the build chamber. The intelligent, material-specific rePLUG unit for powder supply has a closed circuit under inert gas, allowing the powder to be exchanged easily and without contamination within two hours.

Contributing further to maximising productivity is Optomet software. It includes functions for optimising power and exposure strategies for enhanced machine performance, as well as for controlling the temperature throughout the 300 mm cube build volume to normalise conditions and reduce residual stresses in the components being produced.

The manufacturer has underscored its holistic approach to AM by extending the DMG MORI Qualified Products (DMQP) program to include peripheral components and accessories from third-party companies. The main focus is on economy through unrestricted selection of powders and their return for recycling through selected DMQP partners, such as the global Heraeus group.

The wide choice of materials is available within a few working days through the DMG MORI online shop. They range from tool steel and stainless steel through aluminium and cobalt-chrome to Inconel and titanium, covering almost every requirement in the target industries.

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STM starts coaching initiative

The Austrian waterjet pioneer is now paving the way for small and medium-sized companies to more sustainable production

Small and medium-sized enterprises have a decisive advantage in the current economic situation; they can react faster than corporations. This is especially true for those that are local, do not depend on suppliers and that have universal machining know-how or repertoire in the company. This is exactly why waterjet users are now ahead of the game. These companies are benefiting from the emergency situation as they are able to compensate for supply shortages from overseas across industries and can prove themselves increasingly in the just-in-time production of large batches. Reason enough for a leading European manufacturer STM to turn the crisis into a win-win situation and make it easier for companies to quickly switch to waterjets across the board. To this end, STM offers businesses free management consulting, which includes business plans, demand analyses, cost-benefit calculations, digitisation issues and process optimisation in manufacturing.

For this purpose, experienced STM application engineers familiarise themselves with the individual company situation, make suggestions and present definite waterjet solutions, which are verified with free test cuts and can be mastered through training. Last but not least, the coaching package includes the procurement of used equipment and an own financing model, which will soon be ready for the market. All this is easily implemented remotely during quarantine periods with the help of the latest conference technology.

"The situation is by no means hopeless," managing director Jürgen Moser states. "Paths are created only by walking them. With our initiative, we offer interested entrepreneurs a practical shortcut without any stumbling blocks." For the time being, the campaign will run until the end of August. Interested parties from German-speaking countries can contact STM test centres in Germany, Austria and Switzerland.

Over the last 30 years, STM has consistently developed its waterjet system into a modular system of unlimited possibilities that is ideally suited to the "Big 5" of future-oriented production: Flexibility, economy, high degree of automation, resource and energy efficiency and sustainability.

More flexibility

Waterjet cutting is almost magically versatile. The cold cutting process is suitable for steel, aluminium, non-ferrous metal, glass, stone, plastic, composite materials and food. A wide variety of materials in thicknesses from 0.1 to 300 mm can be cut quickly, with high quality and without any conversion effort. Parallel pure water and abrasive cutting is possible, regardless of whether 2D, 3D, pipe or robot cutting is requested and regardless of whether prototype, small series or large quantities are called for. Cutting with waterjets turns the series production of the all-important corona sneeze guard for checkout areas into child's play, as much as the production of mouthguard blanks.

More economic efficiency

Whether it is individual or series production, this cold cutting process guarantees cost-effective production with maximum precision, small cutting widths and best cutting edge quality. Based on conventional CAD data, the technology enables the material and time-saving nesting of several work steps. Even highly complex forms can be produced with absolute precision and clean cut edges without deforming material or surfaces. With a standard PC and the intelligent SmartCut software from STM, drawings can be imported and cutting parameters defined in no time at all. The system calculates cutting time and costs per order so that production in the ideal cutting area can be controlled at any time.

Malfunctions can easily be remedied by the user or through remote maintenance. The usually customary post-processing due to thermal deformation or burrs is eliminated completely. Maintenance requirements are also low, most problems can be resolved quickly and inexpensively via remote maintenance. Another important aspect is the high wear resistance of the equipment. Thanks to the fact that STM only uses series components with long-term availability, the machines have a nearly

unlimited service life and can moreover be upgraded to match requirements. Good logistics with short transport routes and extremely customer-oriented support guarantee smooth operation.

More digitisation

STM waterjet cutting systems are characterised by a high degree of automation and ease of operation. Cutting jobs can therefore be processed almost all around. STM systems have been also M2M-capable and enable data exchange via all currently possible interfaces. On the one hand, this is ensured by the SmartCut software which enables a complex data exchange with work preparation, CRM and process control systems. On the other hand, the systems can be linked with standardised interfaces like ProfiNET, ProfiBUS, UDP protocol or OPC server in order to connect them to other cutting machines, automatic loading machines or robots.

Unlike with multi groups, STM application engineers are prepared to show customers the digitisation of production and to explore all options regarding data exchange and intelligent data processing in an interdisciplinary manner. They have a profound know-how of how production data can be exchanged in a more or less open network and processed intelligently with the help of STM systems.

More energy and resource efficiency

Waterjet cutting is, per se, an energy-efficient cold cutting process. At STM, this advantage is also supported through the design. STM waterjet cutting systems are as standard equipped with energy-saving drives and lightweight guides, energy-saving LED lighting and a highly efficient power supply. The ideal ratio between CW connected load to pressure and litres per minute the high-pressure pump, the heart of the waterjet cutting systems, additionally ensures minimum energy consumption.

Waterjet cutting powered by STM helps to save resources, even the energy aspect. It requires minimal personnel and tool costs. Material consumption is minimised by technical details like infinitely variable abrasive dosing and the efficient nesting of cutting jobs.

More sustainability

On the ecological side, waterjet cutting becomes attractive as neither gases nor dusts are generated during operation. Process water and seals can also be recycled easily, e.g. with the fully automatic "OneClean" recycling system for water and abrasive, which is globally unique. All residues can be separated and disposed of properly. In addition, the systems have impressively long service lives and individual components of old systems can still be used in newly purchased ones as the STM module system is almost fully compatible.

In view of these advantages, the capital expenditure proves to be quite feasible. If, for example, you purchase a high-quality and literally inexpensive machine from STM worth 90,000 euros or more, the system will pay for itself after just seven years at a production yield of 30,000 euros per year, 150 euros per day. This calculation should

motivate even conservative calculators. It is therefore no wonder that investment in water cutting equipment is also subsidised by the state through special depreciation and structural improvement funds. In addition, STM, in cooperation with a Swiss bank, wants to have its financing programme re-launched in cases where entrepreneurial spirit is hampered by a lack of liquid funds. In any case, it is worthwhile for processing companies to use the involuntary spare time to sound out the potential of waterjet technology for their own needs with the help of STM without obligation. The test centres in Austria, Germany and the Switzerland are available by telephone and video link at normal business hours during the quarantine period.

StM is a leading supplier of waterjet cutting systems based in Eben, Austria, Schweinfurt, Germany and Reiden, Switzerland. For more than 25 years, the traditional company has developed integrated solutions, mainly for the steel, aluminium, metal, plastic, stone and glass industries, which are most notable for their efficiency, ease-of-use and resistance to wear. Since 2018, the company has also held the sole production rights to Bystronic waterjet cutting systems. StM stands for standard CNC-controlled portal systems in all dimensions and for all applications. In addition to economy, standard quality and excellent customer service, StM attaches particular importance to innovative modular system technology. The brand manufacturer thus ensures that its individual manufacturing processes are continually matched to the latest requirements of its customers. The Group has locations in Austria, Germany and Switzerland, employs a total of 70 people and is represented in countries worldwide.

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AXYZ expands waterjet capabilities with new 5-axis cutting head

Leading supplier of high-performance CNC machining solutions, AXYZ Automation Group (AAG) has radically expanded the production capabilities of its WARDJet waterjet cutting systems with the introduction of a new and exclusive 5-axis cutting head. The Apex-60 is a compact and fully integrated machine enhancement that is claimed to be the most affordable of its kind on the market and capable of bringing the benefits of three-dimensional cutting technology to a much wider range of industrial applications.

Key performance attributes of the Apex-60 include the ability to cut at angles of up to 60 degrees, with a cutting force of 39 N and at speeds of up to 50.8 m/min which AXYZ considers exceeds those of any comparable cutting head. The Apex-60 also greatly increases the speed and efficiency at which ancillary finishing processes can be carried out that would otherwise require additional machine shop staff and thus add to operating costs and machine downtime. Typical examples include the creation of 60-degree cut bevels, weld preparation, grinding, chamfering and countersinking. With a Z-travel capability of 304.8 mm, the Apex-60 will also accommodate processing of the thickest materials and largest parts likely to be used for any application, while allowing full maximisation of the cutting envelope and with no compromise on quality.

The WARDJet waterjet cutting machines supplied by AXYZ Automation Group are based on over 25 years of experience with this continually developing technology. The machines can be used to process a wide range of materials that traditional CNC routing and knife-cutting systems cannot effectively handle. Typically, these include more complex materials such as stainless steel and other non-ferrous metals, cast and wrought iron, alloys like brass and bronze, stone, marble, ceramics, glass, fibreglass, high-density plastics and laminates, solid and composite rubber formulations and soft goods materials.

The machines are suitable for an equally diverse range of industrial applications, including, for example, those existing primarily in the general engineering, automotive, aerospace, aeronautical, electrical, metal and glass fabrication, plating/finishing, marine and educational sectors.

Important design characteristics that are either unique to or in common with all WARDJet machines include the now familiar rigidly constructed CNC machine and tank gantry to facilitate the most vigorous machine operation likely to be encountered, multiple cutting tool head options (including the new Apex-60 on most machines) and ball screw drive systems for optimum machining accuracy and the elimination of operating problems frequently experienced with conventional belt-driven systems. An optional water level control system and machine enclosure to help reduce splashback and thus conserve water whilst keeping machine noise to a minimum further enhance environmental and workplace safety credentials.

Applications range from small parts and components production carried out by engineering shops and machining centres to high-volume and large-format output manufactured by bigger industrial-grade companies.

Part of the A-Series of WARDJet machines, the A0612 is described as an ideal industrial-grade but smaller and more compact machine that meets a requirement for which previously there were only limited options. Significantly, it shares the same design and performance characteristics of a full-size waterjet machine but at a much lower cost. The comparatively small 213 x 124 cm footprint also contributes to easier transportation, installation and in-company portability, as well as the ability to fit perfectly into any workplace environment where available space and cost-to-performance efficiency are primary considerations.

A major factor contributing to the continuing popularity of this particular machine is that, whereas similarly configured small-format alternative machines operate at pressures ranging from 30,000 to 45,000 psi, the A0612 can operate at the significantly higher 60,000 psi. This equals the performance of a full-size waterjet machine and enables users to cut materials with a thickness of up to 177 mm.

The larger-format X-Series and Z-Series of WARDJet machines have been designed with an impressive choice of different configurations, including up to 16 cutting heads on one gantry. The X-Series is available in three different-sized models (the 1515, 1530 and 2040), with a cutting speed of 20 m/min. The Z-Series is available in a choice of five different-sized options the 2043, 2543, 2546, 3043 and 3064, with a cutting speed of 12.7 m/min.

All the machines are backed by powerful and comprehensive performance warranties.

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Next generation of taper angle control

Alphajet waterjet cutting tool from Water Jet Sweden

Water Jet Sweden has launched Alphajet, the next generation of taper angle control and perpendicular waterjet cutting. Alphajet is mechatronics based on compact design with a fixed TCP point. Out of the ordinary cutting result are achieved with carefully selected machine elements and small precise movements at an angular accuracy within ± 0.05 mm.

"It's easy to do something complicated, but difficult to do something simple," says Tony Rydh, founder and technical manager at Water Jet Sweden. With our newly designed Alphajet, we take Taper Angle Control to a new level. TAC is a proven feature in the industry, but we make it a notch better in almost every respect."

Compact and modern design

The new Alphajet has a compact design which means less weight and less limitations on the working area. This is extra beneficial for those who want to arm their machine with more than one cutting tool. You can fit up to four Alphajets on the same machine, thereby quadrupling the cutting capacity, while still keeping the high accuracy.

Maximum accuracy

"The less movement the higher accuracy. This was one of the guidelines when we designed Alphajet," says Tony Rydh. The new Alphajet has a fixed TCP, which means that the machine's X and Y axes doesn't need to move to handle the taper angle control. Alphajet has a unique gearbox design; The 45-30-30 angles requires very small movements in the A and B axes when cutting and the choice to put the toolholder very low on the cutting head provides a low rotation point with small, more accurate movements. " Alphajet has the ability to withstand a maximum angular compensation TAC up to ± 14°, which is the best in the market. However, our design requires just a few degrees of inclination to get perpendicular surfaces and edges," he adds.

The mechatronics is equipped with FANUC absolute servo motors, so no reference cycle is needed to be run. The Absolute motors are directly connected in Harmonic Drive Gear to eliminate mechanical sources of error such as backlash and play.

Easy operation

Changing the cutting head is a quick and easy operation. The cutting head is automatically centered thanks to the v-block toolholder and there is no need for extra calibration after changing the focusing tube. This both saves time and maintain the precision of the cutting head.

No special CADCAM programs are required to use Alphajet. IGEMS basic CAM waterjet cutting modules already contain data for the most common materials. In addition to TAC, there are functions for compensating the dynamic properties in the cutting process such as LAG (Lag compensation) and VOC (Variable Offset Control) included in the associated software.

Fully equipped

There are no limitations. All of Water Jet Sweden's different cutting heads designs fits the new Alphajet, and you can from 3,800 bar to 6,200 bar technology. Practical and advanced features are offered as standard. Spray protection minimises water spray when piercing and the collision sensor protects the nozzle from breaking in the event of a collision. An Online Height Sensor is available to ensure the accurate cutting result.

Fits all machine models

Since the Alphajet design only requires 4-axis system control, it can be applied on all machine models of Water Jet Sweden. From entry level single head machines to the more advanced, multi head machine solutions. It is the customer's needs that decides, not technical limitations.

"A precision cutting head utilise its full potential on a quality machine," concludes Tony Rydh. Water Jet Sweden's machines have market leading accuracy, are made in Sweden and include a five year performance warranty.

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KMT Waterjet Systems

The right choice for cutting aluminum, titanium, metal, cakes, celery, fish, marble, stone, composites, foam and much more
For over 49 years, KMT Waterjet has been providing waterjet cutting pumps and components to a global network of waterjet table cutting systems integrators who offer entry level to advanced, reliable waterjet machine systems that offer a clean, precise cut on time, every time. The power of water cutting has been harnessed and refined so that KMT Waterjet pumps and the OEM table systems will many materials. You can cut aluminum and cut titanium as efficiently as possible with KMT Waterjet Systems, bringing true value to end users. Below are some comments on the value of KMT products from our valued customers.

Maximum Industries utilises the latest technology in CNC equipment for waterjet cutting, laser cutting, machining, routing and laser marking. Maximum Industries has six waterjet systems, including two 5-axis high gantry systems. All waterjet systems are powered by KMT Waterjet pumps including the KMT STREAMLINE PRO 90,000 psi | 6.200 bar 125 hp pump.

Stainless Drains designs and furnishes many different types of drainage systems including area drains, trench drains, cleanouts, P-traps, accessories and much more. Stainless Drains cuts 304 and 316 stainless steel with KMT Waterjet UHP pumps.

Advanced Fabrication upgraded from two 55,000 psi waterjet pumps to the KMT Waterjet STREAMLINE PRO III 90,000 psi 125 hp pump. With over 800 hours of seal life, AFT is waterjet cutting up to five inches of steel, aluminum sheets and stainless steel. The KMT PRO III 90,000 psi waterjet pump has improved the quality of parts, uptime and reduced the cost of operation compared to the 55,000 psi waterjet pump.

MultiCam 500 Series
The MultiCam 5000 Series 5-axis waterjet system is powered by the KMT Waterjet MultiCam 5000 Series PRO60 90,000 psi | 6.200 bar pump. You can increase production by 50 percent over 60,000 psi | 4.100 bar pumps, while significantly lowering abrasive consumption as well as reducing cost-per-part.

KMT is a Shape Technologies Group company, partnering with the world leaders in UHP technology to engineer and deliver the future of manufacturing process solutions.

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Central Canadian Glass utilises OMAX expertise

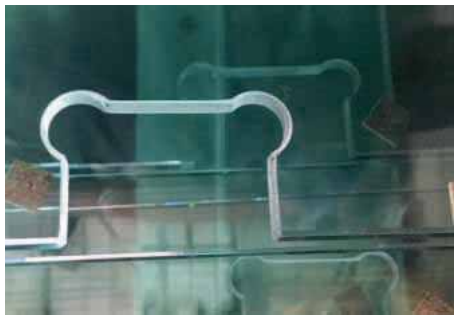
The Fogo Island Inn, New York Yankee Stadium and the Shangri-La Hotel: these are just a few extraordinary projects produced by the glass architectural and design-focused Central Canadian Glass (CCG). Its large shop highlights an all-in-one method of production where fixturing, stonework and metal are cut alongside glass. Committed to providing its clients a product of the highest possible quality with the best turnaround time, the Concord, Ontario-based fabrication shop has earned the right to be called an industry leader in custom glass.

Shangri-La Hotel, Vancouver Canada

CCG started in 1988 with four people. "Glass is the last product you need in a construction project and once the area for the glass is measured, they need it. Our growth was driven by lead times. We decided to go with technology to build our business." says Pat Trainor, president of Central Canadian Glass.

Over the years, CCG utilised progressive glass cutting methods to give it a competitive edge when introducing new products to market. Today, the company now has 55 employees and a 3,700 sq m facility that contains state-of-the-art glass fabricating equipment operated by experienced craftsmen.

One of the primary innovations CCG made over the course of its 31-year history was integrating OMAX abrasive waterjets into its workflow. All OMAX product lines can be used for cutting a wide variety of glass products, from ultra-thin panels for smartphones to thick multi-layered bullet-proof panels for vehicles and buildings to panels for stained glass windows. There are some inherent issues with machine cutting glass and OMAX resolved these challenges by introducing low-pressure piercing. Now, even the most brittle glass can easily be pierced to create a starting point, yet still be cut at maximum speed.



Pat Trainor recalls his first meeting with OMAX: "Years ago, an OMAX salesperson walked into our office making a sales call. I asked, 'What is the best thing about OMAX?' The salesperson responded, 'the people.' It was at that point I knew that OMAX would make a great partner." CCG has been a customer for years, utilising customer service and support to ensure their machines are always making money.

In January 2014, CCG purchased a MAXIEM 2040 JetMachining Center. Designed for shops with high-capacity production demands, the MAXIEM 2040 abrasive waterjet system can easily machine almost any material. Pat Trainer elaborates: "Cutting with our waterjet allows us accuracy and repeatability." The MAXIEM line showcases a linear accuracy of 0.762 mm and a repeatably of 0.025 mm making remarkably precise.

Beyond precision, the MAXIEM helped improve CCG's productivity. "Something that was a one- or two-week job, we do in one or two hours," adds Pat Trainor. CCG is renowned for its ability to put out great quality work when the customer requires. "We'll go into any shop in Eastern Canada or the North East United States and we'll say: "We're not cheap, but when do you need it?" When a job needs to be done and it needs to be done right, CCG has been there. To help facilitate this commitment, CCG purchased a second MAXIEM 2040 in 2015.

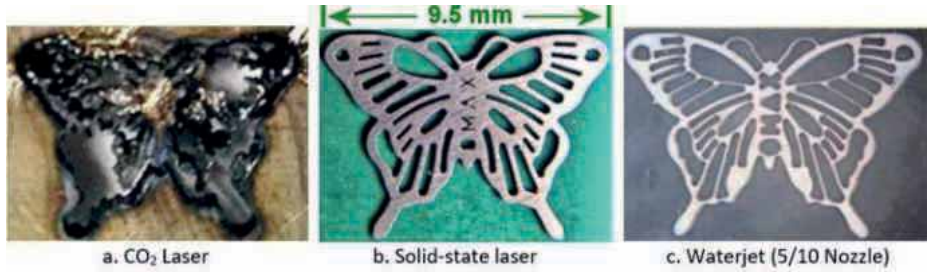
The fabrication shop primarily cuts 3-19 mm glass and mirror. However, as Pat Trainor concludes: "Since we've introduced OMAX, it has got us into so many different industries. We're into everything now: glass, metal, stone, you name it, we cut it with a waterjet. The diversity of what we can offer is key. A lot of contractors, architects, designers don't want to run all over the place getting this here or that that there. They come to us."

Why waterjet is the best method for cutting stainless steel

Almost every machine tool claims they are the best at machining stainless steel. For some applications, the tolerances achieved by most machine tools and subsequent effects imparted by the machining is fine. However, when a fabricator or prototype creator is looking to produce a high precision part, have it weld ready, or get it done now, there is really only one method and that is abrasive waterjets.

To help illustrate our argument, we'll consider traditional CNC machining, as well as lasers and plasma, before examining the value-added benefits of cutting stainless with an OMAX abrasive waterjet.

Stainless steel is most often machined using conventional CNC mills and lathes. The biggest drawback to this is that stainless steel is very susceptible to work hardening.



a. CO_2 Laser b. Solid-state laser c. Waterjet (5/10 Nozzle)

The machining process must be optimised to disburse heat to ensure work material isn't distorted by heat-affected zones. In addition, the actual cutting tools, either high-speed steel or carbide, must always be kept sharp. After machining stainless steel on a CNC machine, an operator is often left with rough edges. To truly finish a part machined on a CNC, a file or deburrer secondary process is added.

Lasers and plasma cutters are often used to cut thin gauge stainless steel. The use of either of these methods involves extremely high heat. Plasma cutters are primarily rough cutting tools that require several secondary procedures to get a clean finish. CO_2 laser is quick, but ineffective in fine details. Solid-state lasers are better for detailed cutting than CO_2, but neither option is as effective as an OMAX abrasive waterjet.

With abrasive waterjet, cutting stainless steel is quick, easy and removes the need for many secondary processes. One of the most heralded benefits of abrasive waterjets is that it is a cold cutting process, meaning there are no heat-affected zones. This allows for a part that was cut on a waterjet to be welded immediately. Another huge benefit is that, since there is no material distortion due to heat, detailed work can be done to specification. Operators don't have to concern themselves with the possibility of melting or gouging.

One of the biggest benefits of abrasive waterjet over laser or plasma is the thickness of the material cut. Laser cutting, both solid state and $C0_2$, is restricted to thinner gauges of stainless. On top of that, since stainless is reflective, it needs to be coated in a non-reflective film before laser cutting can occur. Though plasma doesn't require special coatings for cutting, it still can only cut material about 1.25 inches thick before losing force and making a mess of the original material. OMAX abrasive waterjet can cut much thicker dimensions of stainless. It is not uncommon for fabricators to cut 6-inch-thick stainless steel part on their OMAX abrasive waterjet.

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New press brake range can be customised

A new range of press brakes has been introduced by Bystronic, designed so that they can be customised to suit a user's requirements in terms of process speed and flexibility. Available in the UK and Ireland through the Swiss manufacturer's Coventry subsidiary, the modular Xpert Pro series comprises three models plus a variety of optional extras.

The Classic Edition is intended for prototype manufacture and job shops producing small batch sizes. With the Performance Edition, medium-sized companies can produce larger series quickly and reliably. Dynamic Edition is ideal for companies that need even more speed to handle batch sizes of 1,000 pieces or more efficiently. It is claimed to be one of the fastest press brakes on the market, with bend speeds up to 20 mm/sec.

Press capacity ranges from 100 to 320 tonnes, enabling sheet up to a thickness of 15 mm to be processed and bending length is either three or four metres. Companies that require even more flexibility can connect two machines together to bend longer parts.

Thanks to the variety of configuration options, application possibilities are extensive and an Xpert Pro can be flexibly adapted to new requirements through straightforward retrofitting of optional modules. For example, if at some point a company wants to bend complex shapes in addition to rectangular parts, they can retrofit a backgauge with from two to six CNC axes.

Manufacturers that have already invested money in bending tools want to reuse them when they purchase a new press brake, but this is usually not possible when changing supplier, as there are almost a dozen different tool systems on the market that are incompatible with each other. This problem has been solved by the Xpert Pro range, as the versatile machines have been designed so that tool systems from other suppliers can be used. An automatic toolchanger is available as an option for even more efficient changeover between jobs.

Bystronic's patented dynamic crowning compensation system ensures bend accuracy and consistency by automatically adjusting the curvature of the beam during the bending process. The latest generation of pressure reference technology carries out corrections in real-time, based on closed-loop feedback from sensors.

A model from the new Xpert Pro press brake range from Bystronic

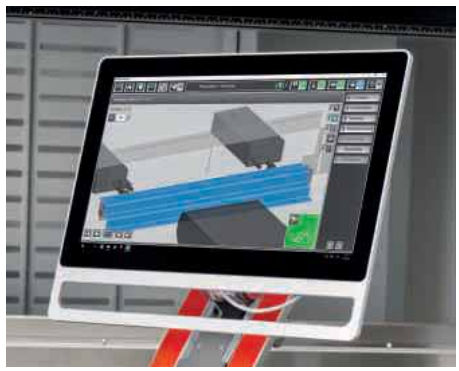
For even higher process reliability and repeatability, an angle measuring system called LAMS is available as an option to compensate for springback and deviations in the thickness of the sheet being bent, which can be as much as 10 percent. Correction data for that particular material can be stored and transferred to other machines, even those not equipped with LAMS, to avoid tedious manual corrections.

ByVision Bending software determines the ideal process for every material thickness and bend angle. Convenient offline programming enables data to be imported without interrupting production.

Bystronic UK provides today's UK and Irish manufacturer with laser cutting, bending and automation systems along with software that streamline the process chain and minimises waste to increase profit. Located in Coventry, Bystronic UK provides sales, service, training and support to customers throughout the UK and Ireland.

Established in the UK for over 100 years as both Edwards Pearson and Pullmax UK, Bystronic UK has a vast experience and is centrally located to support the UK industry.

Bystronic is a leading global provider of high-quality solutions for the sheetmetal processing business. The focus lies on the automation of the complete material and data flow of the cutting and bending process chain. Bystronic's portfolio includes laser cutting systems, press brakes, and associated automation and software solutions. Comprehensive services round off the portfolio.



Operation is simple using a touch screen and ByVision Bending software

As a reliable partner, Bystronic stands for high-performance innovations, local expertise and service excellence. Since 1994 Bystronic has been a part of the Swiss industrial holding company Conzzeta.

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Efficient production of sheet metalworking tools

German press brake tooling and guillotine shear blade manufacturer, UKB Uwe Krumm GmbH, Burbach, whose products range from 60 mm to 6,000 mm in length and weigh from a few hundred grams to several tonnes, has 14 machining centres on its shop floor. Across all of the equipment, which is also employed for general subcontract machining, only two types of vice are used regardless of the size and geometry of the component and the material being processed.

The workholding devices are supplied exclusively by the Hilma division of the Roemheld group, whose factory is in nearby Hilchenbach. There are around 90 vices in use from the firm's NC160 and VL160 series. Supply of these products in the UK and Ireland is through subsidiary company Roemheld UK, Hitchin.

Standard base length of the vices is 750 mm, providing a clamping range of 508 mm, sufficient for most of UKB's workpieces, while various top jaws enlarge the range to a maximum of 772 mm. Configurations vary from five vices on the smaller milling machines in Burbach up to 14 vices on a DMG MORI DMF 600 linear 5-axis model with a 6 m X-axis.

UKB's head of production Peter Diehl says: "We use the vices for everything from simple 3-axis operations to complex, 5-axis machining applications requiring multiple setups. They are highly precise, always dependable and easy to use."

In view of the requirement for high precision machining, typically to within ± 0.01 mm, Peter Diehl attaches special importance to process reliability.

He adds: "Clamping components with minimum deformation is of major importance to us. With Hilma machine vices, we can hold the workpiece at maximum pressure for roughing, say to reduce a tough Hardox steel blank for a 5 m tool weighing six tonnes to just 1.5 tonnes, then lower the clamping force for finish machining."

The workholding systems, which are either manually operated or hydraulically actuated by hand or a foot switch, are

mounted in either a horizontal or vertical orientation. They can be configured in numerous ways for optimum flexibility to simplify process routes and are quickly and easily adapted to suit different workpieces. Peter Diehl advises that the vices and the on-site service provided by Hilma are very reliable, reducing machine downtime to a minimum.

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VOSS Flare 110 forms tubes in a wobble process

With the new, fully automated VOSS Flare 110 machine, VOSS Fluid uses the wobble process, which is gentle on the material and saves time. The tool makes a wobbling movement during which the tube end is precisely flanged against the supporting sleeve with minimum force. This process is an alternative to classical axial forming, in which the material is pressed into a negative form to create the desired contour. The disadvantage of these axial forming processes is the high force required and the high stress on the material. In the wobble process, the steel retains its unbroken grain and thus its high strength. The surface quality of the sealing surface is particularly good because no machining marks are created thanks to the gentle forming process. The steel exhibits higher resistance to fractures and tears.

The VOSS Flare 110 tube forming machine is suitable for the economical series production of ORFS and JIC connections. It provides the user maximum process reliability, as operating errors are avoided during forming caused by the internal stop in the die. The all-electric drive also means that tubes with an outside diameter of 6 mm to 38 mm are processed with very low noise levels. This type of drive permits very precise and reliable control. It is particularly advantageous in very tight tube bends and very short clamping lengths.

For forming, rolling mandrels and clamping jaws with integrated slide for the sleeve feed, depending on the tube outer diameter, are used. The integrated slider in the clamping jaws means that the user does not have to reach between the clamping jaws to insert the ORFS sleeve, but can simply feed the sleeve from the outside. As an option, the machine is also available with a sleeve magazine, depending on the outer geometry of the sleeve. A feeder can be fitted for automatic feeding of the sleeves. This almost completely automates the insertion of the sleeves. The operator only has to make sure that the magazine is filled.

The VOSS Flare 110 flanging machine is also equipped with a touch panel on which the forming parameters for the most common tube dimensions are stored. In

addition, the inspection dimensions for checking the respective flanging can be called up via the display.

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TRUMPF helps Designplan see punching in a new light

Designplan Lighting Ltd, a leading designer and manufacturer of robust lighting solutions for demanding environments, has invested in a TRUMPF TruPunch 3000 to replace two older turret punch machines supplied by another machine provider. The move has led to a plethora of important benefits, not least a significant increase in productivity, a reduction in the amount of manual labour required, fewer secondary operations and lower noise levels.

Sutton-based Designplan commenced operations in 1963 with an idea for a great product: an extra strong light fitting engineered to withstand the most severe environmental conditions, including those found in transport, social housing and custodial settings. Just to prove the strength of that idea, the company today has over 120 staff and a turnover of circa £18 million.

In 2011, the company was acquired by the Sweden-based Fagerhult group, which was followed three years later by relocation to a purpose-built factory. This intense period of change spurred growth at Designplan, as production engineering manager Rob Aldred explains.

"I joined the company seven years ago, when turnover stood at around £11 million. Since then, this figure has increased by an impressive 64 percent. Investment gave us more aspiration to grow and more scope to diversify."

From the beginning, his role has been to tackle and reduce lead times. A big part of this remit involves reviewing the internal manufacturing processes at Designplan on an almost continuous basis. Recently, attention shifted to the company's punching operations.

Rob Aldred says: "We had two older turret punches that began causing problems, particularly in terms of reliability. "In addition, as we started adopting more bespoke work, the number of tool changes became prohibitive to achieving the levels of throughput required."

When one of the machines stopped working altogether, the decision was made to call time and invest in a better resource. However, there was a caveat.

"We didn't want a like-for-like solution, we wanted to move forward and bring in a machine that could increase productivity and reduce our second operation work," adds Rob Aldred. "To make sure we got the right machine, we looked at all the major players and TRUMPF came out on top, not just for flexibility, speed and efficiency, but for our entire wish list."

The TRUMPF TruPunch 3000 offers backlash-free drives that enable high acceleration in all axes, while the high rotational speed of the C axis enables extremely fast tapping and the productive processing of complex contours. Thanks to the powerful electric punching head, users can punch at up to 1,000 strokes per minute and mark parts at 2,500 strokes per minute.

Further attributes of the machine include SheetMaster, which loads and unloads the TruPunch and can optionally be equipped with an integrated tool magazine. On the subject of tools, all those loaded to the punching head rotate by 360° to enhance both capability and flexibility. Users also benefit from the SortMaster Box Linear, which sorts components that fall through the large part flap into up to four boxes. In addition, energy bills will be lower as, thanks to an average power input of only 5.6 kW, the TruPunch 3000 is very energy efficient.

Installed in May 2019, the machine has been set to work producing main bodies for the company's light fittings, along with internal metalwork such as gear trays and brackets. Typical materials include zintec from 0.9 to 3.0 mm thick, and aluminium from 1.2 to 4.0 mm.

"In particular, the new TRUMPF TruPunch has taken a big bite out of our studding and bushing requirements and this will continue as we move through parts, while noise levels have reduced dramatically," states Rob Aldred. "Overall, we are two or three levels up on where we were, across all aspects of our punching operations."

Ease-of-use is cited as another stand-out feature of the TruPunch 3000. In total, three operators have been trained on the machine's operation.

Rob Aldred concludes: "Our target was to hit 50 percent of production levels within the first month, but after the third week we were already at 80 percent. The machine has been fantastic, we really can't fault it."

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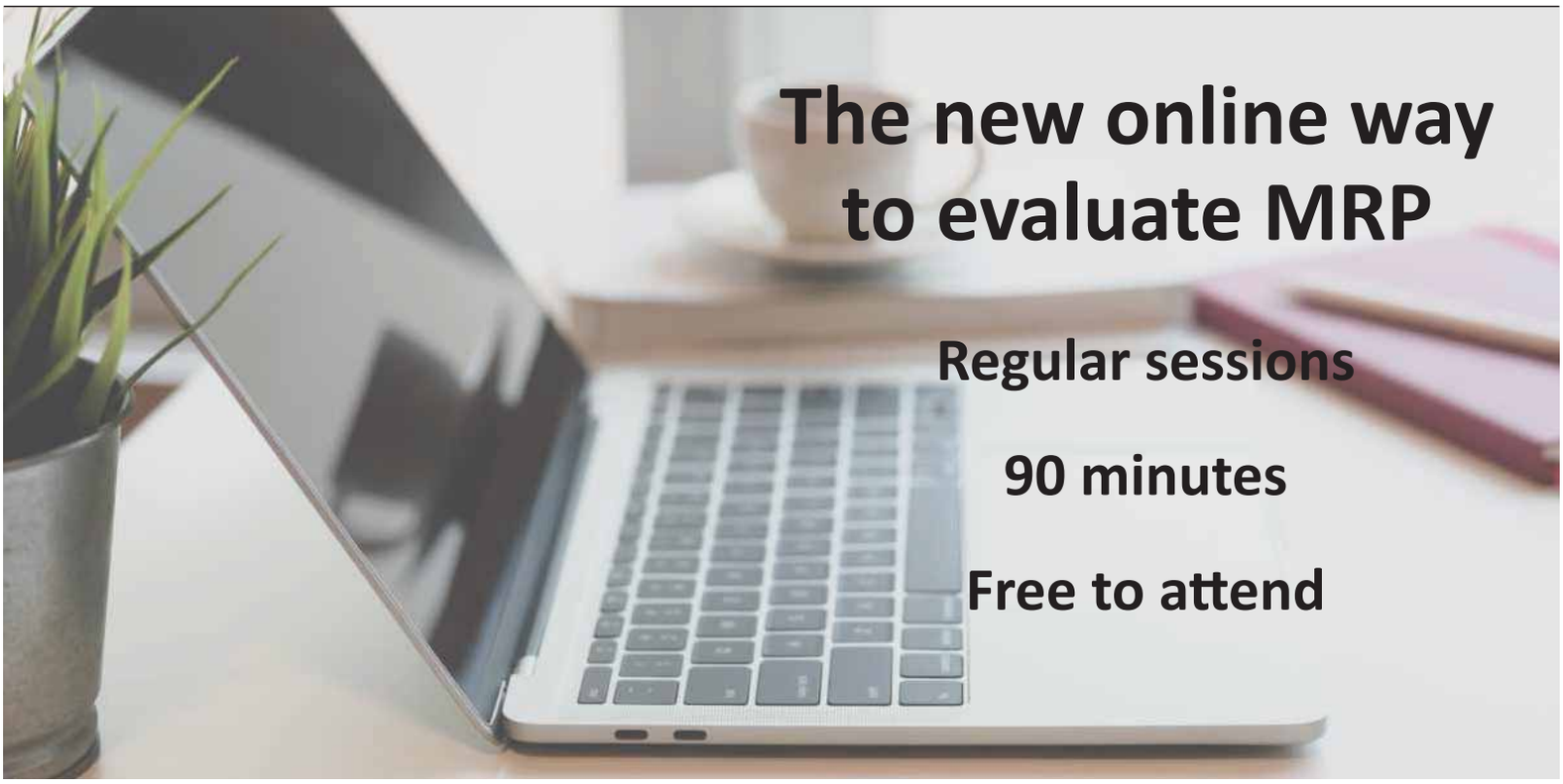

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