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10 years of evolution and growth

An open invite from the team at FC Laser

- see page 35 for further information

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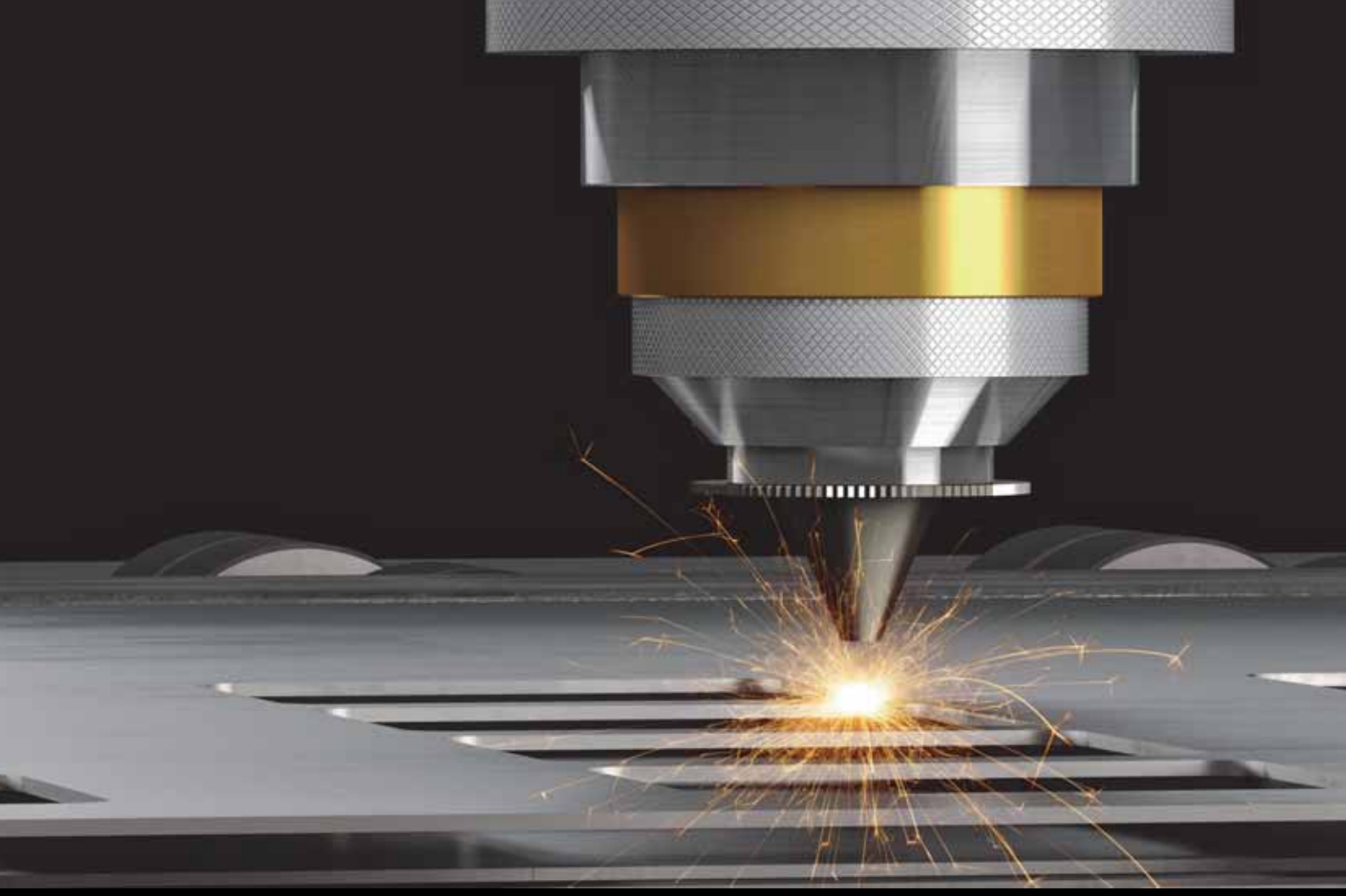

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Publisher/Editor: John Barber - 01403 266022
Email: john@rbpublishing.co.uk

Accounts: Jackie Barber - 01403 563791

Production manager: Anna Rodrigues - 01472 210712
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FC Laser celebrates 10 years in style with more services announced

10 YEARS ANNIVERSARY

FC Laser celebrated its 10th year anniversary during the Jubilee bank holiday. All employees were invited to the FC head office in Stanton by Dale, Ilkeston, where an official opening ceremony of its new capacity doubling facility was unveiled.

Drinks and refreshments were supplied from the back of authentic TukTuks that the company are converting as part of an independent division of the business.

There was also a demonstration of the new Bystronic automated loading and storage system. This new hardware is connected to two 12 kW Bystar machines.

Managing director Daryl Lowe says: "I am thrilled with the ongoing growth of the business and proud that as an employee-owned company, all members of staff have an active role in the continued success of FC Laser and its affiliate divisions."

An open invite from the team at FC Laser

As its business continues to grow, FC Laser is always on the look-out for new partners. This Summer it is inviting any company that would like to work with it, the opportunity to visit its facility for a full tour including refreshments from one of it's TukTuks. The company truly believes you must experience the service and professionalism that it offers first hand. If you are interested in taking a facility tour, email **enquiries@fclaser.co.uk** to book a tour with an FC Laser account manager.

FC Laser
Tel: 0115 944 3428
Email: enquiries@fclaser.co.uk
www.fclaser.co.uk

Julia Moore bids a fond farewell and announces new CEO for the GTMA

This year marks the GTMA's 80th anniversary and provides an opportunity for a new and exciting chapter as the current chief executive officer, Julia Moore, hands over the reins to her successor, Dr Alan Arthur, on the 1st July 2022.

Julia Moore says: "I have been CEO of the GTMA for almost 25 years and I am looking forward to handing over to Alan, who joined the GTMA in January 2020 as chief technical officer and brings with him a working knowledge of trade associations and a strong background in engineering which will be a great asset to the GTMA."

Julia Moore, GTMA

CEO Dr Alan Arthur, GTMA

Initially, upon joining the GTMA all those years ago, Julia Moore was tasked with delivering six EU funded research and development projects for the tooling industry. While the business world may have changed, the contacts and relationships forged across the world remain between the Association and its global partners.

Change is, as we all know, a constant. Technological change has played an important part in the Association's development programme throughout the years and continues today with additive manufacture, composite tooling, continuous fibre injection process and incremental sheet forming. There was a change of address in 2008, when the Association relocated from Buckinghamshire to the West Midlands. "This move has been instrumental in raising the profile of the Association and strengthened our connection with the manufacturing supply chain throughout the UK," states Julia Moore.

With technology moving forward into the 'digital marketing age' this was an opportunity the GTMA embraced. "This has gone from strength-to-strength through the resilience of David Beattie," says Julia Moore. "He is the driving force behind the ongoing development of the GTMA website, as well as setting up GTMA events, which culminated in June this year with the fourth Manufacturing Solutions Ireland event, our largest show with over 150 exhibitors."

She continues: "Roger Onions, a past president of the GTMA, has been leading the technical and supply chain strategy in the GTMA for over 12 years. Our success has been in supporting manufacturers sourcing suppliers in the UK. His broad knowledge in engineering and key industry decision makers has unquestionably provided GTMA with a unique opportunity to forge links with industry.

"Andrea Jerromes joined us seven years ago in Alcester and has been a marvellous contributor to our small team. To make everything work together, she brings exceptional administrative and organisational skills and continues to provide the cohesive support for us all to 'punch above our weight'."

More recently, Juliette Hollis joined the GTMA team and delivers a talented social media programme including videos and assists member companies to see the benefits of a social media platform that the GTMA offers. "Karen Beattie also tirelessly delivers another 'jewel', our analytics service for the members, driven through the success of the GTMA's website. The extensive list of testimonials we receive is rewarding and inspiring to us all," Julia Moore points out.

In 2017, the GTMA gained ISO 9001 certification and this has certainly contributed to the team continuing to operate during the pandemic. With procedures in place, everyone remained connected to cope with the two years of the COVID 'shutdown.' With communication technology available, the small team was able to quickly adopt the new way of working and soon regular online meetings were held with the members. Remarkably, over 30 new members were recruited through these online resources.

Julia Moore concludes: "Our achievements show what a really great team can do. So, it is with enormous pride that I leave the GTMA, taking many fond memories of a wonderful career gathered over the past 25 years at the Association and say a fond farewell to the terrific team and directors at the GTMA, the members of the GTMA who are the people we are working for and the many colleagues I have met and worked with over the years, all of whom have played such an significant part in my time with the GTMA. My good wishes to you all."

GTMA
Tel: 0121 392 8994
Email: admin@gtma.co.uk
www.gtma.co.uk

Hoffmann Group UK to plant 10,000 trees as part of new green initiative

Hoffmann Group UK has recently announced plans to plant 10,000 trees over the next five years as it launches its new green initiative, in partnership with climate solutions specialist Ecologi.

The initiative, which will run until 2027, began on Earth Day, 22nd April with 500 trees being planted in Madagascar. At least 62 trees will be planted each month, with 50 of those being in the UK and the rest around the globe supporting worldwide projects. A further 500 trees will also be planted over the coming weeks in conjunction with the Royal Jubilee initiative Plant a Tree for the Jubilee and World Environment Day, which both took place in early June.

Finally, the business will plant 62 trees to plant one for each of its UK employees and a tree for every GARANT GreenPlus product purchased by a customer. Hoffmann Group UK's GARANT GreenPlus product range encompasses a variety of sustainable cleaning and adhesive bonding products that are environmentally-compatible, cost-saving and enable faster working.

Alongside the new tree planting project, Hoffmann has also helped to deliver renewable power solutions across the globe through ambitious projects in Mexico, Honduras, India and Vietnam, in partnership with Ecologi. These projects are seeing significant real-world impacts, with 634,607 tonnes of CO_2 having been offset annually through these projects.

Tim Paddison, managing director at Hoffmann Group UK, says: "As an organisation, we recognise we have a responsibility to reduce our environmental impact wherever possible. This project will significantly reduce our carbon footprint and demonstrates the values we operate to.

"With the launch of one of our latest product ranges, the GARANT GreenPlus, that offers businesses environmentally friendly cleaning and adhesive products, this presented the perfect opportunity to make additional strides towards becoming a greener company."

For more information visit:
https://www.hoffmann-group.com/GB/en/houk/

Hoffmann Group UK
Tel: 0121 7164301
Email: ab.uk@hoffmann-group.com
www.hoffmann-group.com

Quality assurance in health technology

Leakage testing of medical-pharmaceutical vials by laser drilling ensures highest quality standards for medical companies

Innovative solutions are needed to quickly and cost-effectively check the required hygiene and quality standards in order to ensure access to high-quality, safe medical and pharmaceutical equipment in the future. Various essential quality and stability tests are already carried out during the manufacturing and processing process of products such as syringe cylinders, vaccine vials or infusion and transfusion bags.

Therefore, the control mechanisms used have to reliably detect even the smallest variation and damage in the material in order to exclude contamination in the context of the application. GFH GmbH offers manufacturers of medical and pharmaceutical products a laser-based solution. A cost and time-saving opportunity is offered to validate this quality test, which works flexibly and gently on materials by drilling high-precision leak holes of just 5 µm to 50 µm diameter into individual specimens of a production line. While the hole sizes can be kept accurate, no cracks or pressures will arise around the drilling site.

As a result of the ongoing pandemic, the demand, especially for so-called 'leakage drilling' in syringe cylinders, increases rapidly. During manufacturing, these deliberately selected samples are intended to exclude defects in the material of the vials and cylinders to prevent subsequent contamination of the transfusion or leakage during usage. Increasing demand for such control procedures is due not least to global vaccination campaigns and the associated increased demand for flawless medical and pharmaceutical products. Manufacturers therefore need reliable methods that can carry out random quality check with high precision in a time- and cost-saving way. For this purpose, laser technology is a predestined method due to its very precise and non-contact processing beam, which is why some well-known manufacturers have already approached GFH GmbH regarding the generation of leakage drills.

The Bavarian laser experts have developed a process, which allows the drilling of high-precision leak holes validating the control mechanisms used in production without much effort. The resulting, defective, products with micro drill holes are then integrated into the manufacturing process of the medical device manufacturers. These prepared products then form the control group for the quality and leak test. "The ultrafast laser serves as an excellent tool to equip the glass vials with leakage holes which are very small and precise, but still do not damage the material around the drill hole," explains Andreas Reitberger, sales manager at GFH GmbH. "There are numerous reasons for this: on the one hand, the ultrafast laser pulses that hit the material prevent tensions and cracks in it by means of so-called "cold ablation". On the other hand, there are no limits to the variety of materials used in laser processing. This enables even hard-to-machine materials such as glass or special medical plastics to be processed with high precision."

Micro-drilling without additional material stress

For the aforementioned process application of the leakage holes, the laser beam is positioned on the workpiece via two mirrors with a scanner. As only small masses need to be moved through these optical axes, highly dynamic and flexible processing is possible. The laser beam is therefore focused on an extremely small area and thus drill holes with a minimum diameter, lower limit 5 µm, can be made. In addition, laser processing does not result in tool wear which is why the processing can be repeated at any time. Post-processing is also no longer required for laser micro-machining. "With this technology, the manufacturer benefits from the micrometre-precise adjustment of the drill and the almost unrestricted flexibility of the laser," Andreas Reitberger adds.

The medical-pharmaceutical glass containers usually have a wall thickness of only 1 mm. Depending on customer requirements, the high-precision percussion holes have a diameter of 5 µm to 50 µm. With a tolerance of just +/- 2.5 µm, the drill holes are characterised by an extreme precision that would hardly be possible with conventional mechanical drilling methods. Based on the high-precision measurement methods by optical microscopes used at GFH, a test protocol is created for each individual hole after laser processing, which guarantees that every hole is certified and validated in a high accuracy.

Laser processing saves several settings

Besides processing, the products must also be precisely labelled or marked for further certification and tracking particularly in the

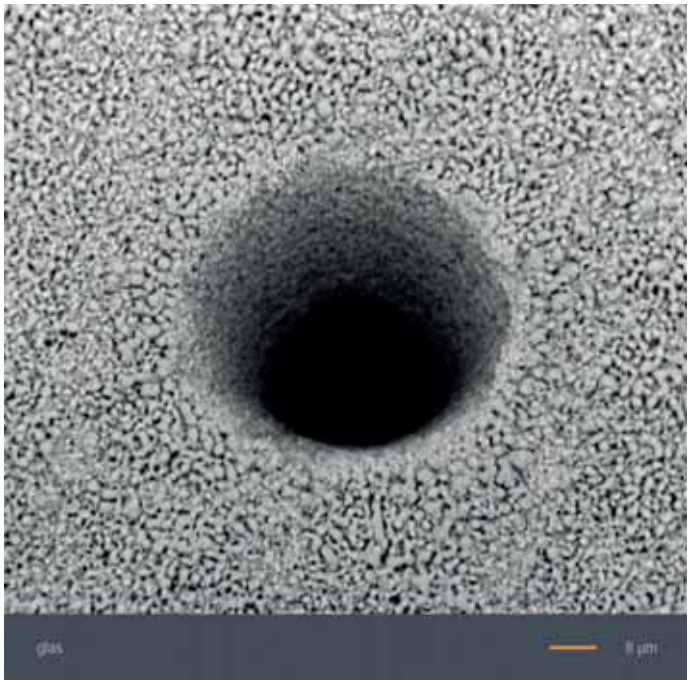
medical and pharmaceutical sector. In conventional machining processes this usually requires several plants, as the workpiece is clamped several times on different processing machines. However, this is different for laser processing. The use of this modern machining method eliminates several clamping operations at once, since drilling and labelling can be carried out in a single operation. Combining these two processing steps significantly saves time and costs.

The long-standing know-how in laser micro-machining and in the construction of series-production machines enables GFH to manufacture or process these particularly demanding products for manufacturers in the pharmaceutical and medical technology sector in its own precision production.

In addition, the company can even develop its own laser system according to the specific requirements on request. "If the customer has a specific wish to purchase such a machine, the suitable GFH series model is selected together with him and equipped with modular hardware and software solutions for the specific application,"explains Andreas Reitberger. All GFH series machines are equipped with an ultrashort pulse laser from well-known manufacturers.

GFH can also offer customised solutions. As part of this consultation, the technicians also provide information about possible special solutions as well as other machining processes that can be implemented in the systems, from laser cutting to laser ablation to laser turning.

Andreas Reitberger concludes: "We are pleased that we have already been able to help many well-known manufacturers secure their supply chains with the help of our established drilling process



for special requests that arise at short notice, such as leakage drilling. Thus, drilling leakage holes with the ultrashort pulse laser in syringe barrels has become a permanent feature in our precision manufacturing."

GFH GmbH Tel: 0049 991 290920
Email: info@gfh-gmbh.de www.gfh-gmbh.de

Sempre brings its metrology expertise to new Renishaw partnership

Metrology provider The Sempre Group has been appointed to Renishaw's Channel Partner Programme to help Original Equipment Manufacturers (OEMs) access high-quality Coordinate Measuring Machine (CMM) and gauging systems. By becoming a premium partner for the UK and Ireland, Sempre can now support OEMs xand end users in the aerospace, automotive and medical industries by supplying Renishaw's leading measurement systems and technologies.

After a challenging two years for manufacturing supply chains around the world, the benefits of localised support and speedy product supply for customers is clear. Renishaw launched its Channel Partner Programme in 2021 to help enhance local customer service and product support throughout the EMEA sales region. Within the programme, new partners are appointed based on their sector-specific experience and expertise in different metrology and manufacturing disciplines.

As a Premium Partner, The Sempre Group will now have reseller access to Renishaw's product portfolio, including the PH20 5-axis

touch-trigger system, the Equator™ gauging system and the REVO® 5-axis measurement system. This uses synchronised motion and 5-axis measurement technology to minimise the dynamic effects of CMM motion at ultra-high measurement speeds.

"The Sempre Group has made several steps to better serve its UK and Irish customers. We've launched new products and services, as well as opened a dedicated Irish facility in County Dublin," explains Jim Mangan, managing director of The Sempre Group. "Becoming a premium partner is a real endorsement of our team. Renishaw carefully selects its partners based on expertise and knowledge of particular regions, something that we hold in very high esteem. We are now in an even stronger position to provide on-the-ground support and a high-quality product offering, giving manufacturers a competitive edge in the global market."

"Its significant presence in the automotive and medical device markets and its new local sales and demonstration centre in Dublin, Ireland, makes The Sempre Group a strong channel partner," explains Jonathan Archer, general manager for EMEA North at Renishaw. "This partnership enables Renishaw to target these markets with its innovative products and solutions and both companies will collaborate further on providing training and support, benefitting our mutual customer base."

The Sempre Group Ltd
Tel: 01452 632712
Email: sales@thesempregroup.com
www.thesempregroup.com

Renishaw plc
Tel: 01453 524524
Email: uk@renishaw.com
www.renishaw.com

German automotive manufacturer is also a Heller beta test site

With the accelerating emergence of electromobility and hybrid technology, the components machined by German firm Stöferle Automotive GmbH are becoming more and more complex, while dimensional accuracy and surface finish requirements are steadily increasing. So, the Laupheim-based company started looking in 2019 for high quality Horizontal Machining Centres (HMCs) on which to produce mild hybrid car components in diameters ranging from 240 to 320 mm with fits between H6 and H7.

After evaluating numerous machines on the market, Stöferle decided to invest in two second-generation HF 5500 5-axis machining centres from Heller, located in nearby Nürtingen. The machines were installed well in advance of their official launch date, as the Laupheim firm is a long-time Heller user and a beta test site for its machines. They were integrated into a production line operating three shifts, seven days a week and produce up to 350,000 components annually. In addition, Stöferle has bought two H 2000 4-axis models from Heller's fourth generation H-series.

Joint managing director Erich Stöferle says: "We perform real endurance tests on Heller machines lasting years. We run them to the maximum, operating at a small percentage below the performance limits specified by the manufacturer.

The production line at the Stöferle Automotive factory in Laupheim into which two second-generation Heller 5-axis HF 5500 HMCs have been integrated

"If the maximum weight of a milling cutter is specified as 16 kg, for example, we go up to 15.5 kg. We use a 160 mm diameter milling cutter at 15,000 rpm, which may not be a problem in single part manufacture but we produce continuously over three shifts.

"Another aspect of the tests is that the two HF 5500s are part of a manufacturing line comprising five or six machines. As annual production quantity has been set at 350,000 pieces, a high level of reliability is crucial.

Katja and Erich Stöferle, joint managing directors of Stöferle Automotive GmbH

A drive motor housing for a hybrid vehicle being machined in one of the Heller HF 5500s

"Our tests show that Heller's aim of delivering machines capable of high productivity and precision day in day out has again been implemented in the new-generation HF-series."

The engineers in Laupheim believe that Heller's new HSU inline spindles produced in-house provide clear advantages over earlier versions. The latest spindles are much more rigid, lowering vibration and the design allows rapid, cost-effective replacement. Stöferle opted for Speed Cutting (SC) spindles rated at 18,000 rpm and 103 Nm torque.

Vibration is also reduced by the

construction of the HF-series, which features a shorter distance from spindle nose to the centre of the B-axis rotary table, allowing shorter tools to be used and often avoiding the need for extensions. The machining centres provide impressive precision. Large components are machined within 20 µm parallelism and have a high-quality surface finish.

Stöferle also carried out field tests on the fourth generation of Heller's H-series of 4-axis HMCs. Starting in February 2020, a year before their launch, a pair of H 2000 machines was used for large volume production and continue to work around the clock.

Fellow managing director Katja Stöferle says: "This was a logical consequence. We operate more than 20 machines in this series and have reliably manufactured over a million components on quite a few of them, without major repairs. We had one H 2000 that ran for 15 years with the same ballscrew drives.

"For producing transmission components in batch sizes of 250,000 pieces per year, machine stability, the quality of the drives and chip disposal efficiency all have to be right. In short, these are our best machines."

Heller has significantly increased the dynamics on its fourth-generation H-series HMCs. Chip-to-chip times have been measurably reduced for the production of some components at Stöferle Automotive

Electromobility increases requirements not only in terms of component accuracy but also batch size, so Stöferle is constantly looking for ways to reduce cycle times. In this regard, it is notable that Heller has improved the dynamics of the latest H-series of HMCs, measurably reducing the chip-to-chip time for some components produced in Laupheim.

Heller Machine Tools Ltd
Tel: 0121 275 3300
Email: sales.uk@heller.biz
https://uk.heller.biz

German power tool manufacturer automates toolmaking department

In mould and die making, individual machining processes are increasingly being combined into automated production cells with integrated handling. The main advantage is a higher degree of machine utilisation, as the systems can operate unattended 24/7. Two prerequisites for realisation of such autonomous systems are more intensive digitalisation of the processes consistent with Industry 4.0 and an increased level of investment.

One company that has followed this automation route is German power tool manufacturer Festool, which produces complex die casting mould tools and plastic injection moulds for producing its products at a factory in Neidlingen. The toolmaking department has installed a robotic production cell based on machining centres manufactured by German firm, Roeders. Similar technology is available in the UK and Ireland through the latter's sole agent, Hurco Europe, High Wycombe.

Jürgen Kopsieker, head of tool and mould making in Neidlingen, explained that his department has to compete with other toolmakers to win business from within the group, while it is also free to offer its services on the open market. The department therefore has no option but to organise itself as a profit centre to ensure it keeps up with market demands in terms of quality, technology and price.

Manufacturing team coordinator Tomislav Jurisa says: "About three years ago we were still an old-style toolmaking department with five individual machines, three machining centres including a 5-axis model plus a wire and a die-sink EDM machine.

"All were constantly supervised by operators who, in addition to monitoring the machining processes, were responsible for fixturing workpieces, loading and unloading the machines and setting and changing tools. In addition, supervisors took care of quality assurance.

"Utilisation of the machines was therefore unsatisfactory so at this point, in mid-2019, we decided to comprehensively upgrade the shop. We wanted an automated manufacturing cell in which milling, EDM, coordinate measuring and aqueous cleaning were fully integrated."

Additionally, to ensure completely unattended operation, the firm was keen to add storage facilities for milling cutters and electrodes, as well as for workpieces mounted on Erowa pallets, with all transport tasks performed by a handling robot. The idea was that operators would simply supply the cell

with workpieces and tools and create the NC programs.

Realisation of this goal became the responsibility of Roeders, which was chosen for the project for two reasons. First, other companies within the Festool group had many years of experience operating Roeders machining centres and reported that they are reliable and precise. Second, the supplier could point to numerous successful installations of complete solutions based on automated manufacturing cells, including the integration of third-party products from a range of different sources.

To implement the installation, Roeders supplied two of its RXP 5-axis machining centres and RMSMain job manager software, which is linked to Festool's IK Office enterprise resource planning system. It also supplied a FANUC R-2000iC handling robot running on a linear rail. Located within the cell also are a Hexagon coordinate measuring machine, an Exeron die-sink EDM machine and an automatic washing system from Mafac.

In addition, a storage room accommodates 110 palletised workpieces and 258 tools, which is supplemented by the capacity of the tool magazines in the machining centres themselves.

Within the cell, a Roeders RXP 601 DSH primarily machines graphite electrodes, while a larger RXP 950 DSH is used mainly for hard machining. Materials include 1.2343 hot work tool steel and sometimes 1.2379 cold work tool steel.

Raw material is rough machined in the hardened condition, 54 - 60 HRC and subsequently finished while still in the same fixture. Compared with the previous procedure of roughing in the soft state, then hardening and finally finishing in a second operation, the new method is significantly faster and less expensive. Cost savings are principally the result of significant reductions in manual operations.

Jürgen Kopsieker enthuses: "I am thrilled about how well the individual elements in the cell work together. The RMSMain job manager is an open system with interfaces for communication with our own IT system as well as other machine manufacturers' software.

"Cooperation was excellent between the Roeders engineers and those at Hexagon, Exeron and Mafac. All systems in the cell worked together without any problems and the projected productivity increase and component quality were reliably achieved right from the start."

He adds that Festool's staff was fully on-board with the project, not only accepting the necessity and advantages but actively committed, even in stressful situations when ongoing production had to be maintained in the midst of the changeover.

The fact that the Roeders software is based on the Windows operating system made it comparatively easy to learn, which proved to be an advantage. The structure and handling of the programming for the machine controls and the RMSMain job manager were also well adapted to a machine shop, so the training needed was minimal.

Hurco Europe Ltd
Tel: 01494 442222
Email: sales@hurco.co.uk
www.hurco.co.uk

Aftermarket cycle component manufacturer predicts rapid growth

Set up as recently as 2016 by ex-professional cyclist Andrew Cooper, Unite has already established itself as an up-and-coming manufacturer of aftermarket cycle products. Having started out with two second-hand, 3-axis machining centres in a factory unit in Newtown, Powys, the company recently doubled the number of machines on the shop floor with the purchase of two new production centres. They are a Brother 5-axis machining centre and a Biglia CNC bar-fed lathe, both supplied by Whitehouse Machine Tools, Kenilworth.

Funds for repayments on the machines are being generated not only by the sale of cycle parts but also by providing a subcontract machining service, a side of the business that has recently risen from five to 60 percent of throughput.

Highly productive 30-taper machining centre

The first machine from Whitehouse, a Japanese-built Brother M200X3 5-axis machining centre, arrived in November 2021 to enable the manufacture in one hit of complex prismatic parts for cycles, such as pedals and stems. It is possible to produce them on the 3-axis machines, but expensive fixturing would be needed and in any case the quality would be inferior, which is the last thing Unite wants while expanding its range of premium products.

Brother machines have a 30-taper spindle rather than a 40-taper tool interface, but that was of no concern to Andrew Cooper as he mainly cuts aluminium. Factors important to him when buying a new machine tool are productivity and purchase price. A couple of 40-taper machining centres were also considered, but he opted for the Whitehouse offering despite it being the first time he had dealt with this supplier.

During machine installation, Whitehouse integrated a Universal Robot cobot that had previously been purchased through WMH Robotics together with a workpiece stocker table. The equipment enables components requiring two operations, such as pedals, to emerge from the production cell completely machined after having been inverted following Op 1 and placed back in the fixture. Initially, blanks are picked up individually from one side of the table in front of the machine and finish-machined parts are returned to the other side.

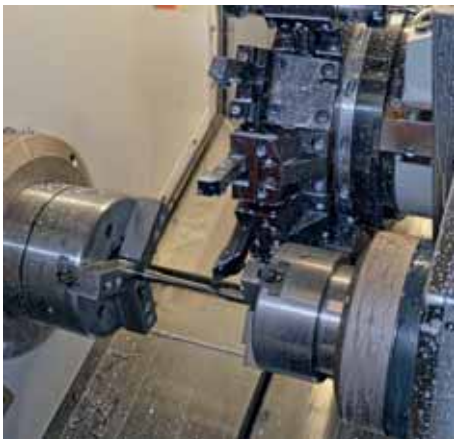
The cell operates largely autonomously for about 20 hours per day, producing parts in batches of from 10- to 1,000-off to a general tolerance of 0.05 mm, although some features are tighter. Rapid setup times in the Brother cell of around five to 10 minutes, without the need for tool exchange as all of the cutters needed are resident in the magazine, make machining the smaller volumes economical. This is fortuitous, as the current high price of material means that producing smaller volumes is highly desirable in order to reduce the cost of work-in-progress.

Turn-mill centre with Y-axis

The Brother M200X3 has a 200 rpm C-axis torque table that facilitates not only milling and drilling but also rotational machining of components with a turning tool in the spindle. While some users find this mill-turn capability in one clamping invaluable, Andrew Cooper does not plan to exploit it for machining his products, as few of them would benefit. Some subcontract components might well be machined more economically using such cycles, however.

Instead, turned cycle parts up to 70 mm diameter requiring some milling content are being produced in one hit from bar in a new Biglia 620YS turning centre equipped with a sub-spindle for synchronous part pick-up and reverse-end machining. The lathe also benefits from a turret with a Y-axis and 15 live stations powered by a 13 kW motor. Y-axis CNC movement is essential, as a number of cycle component such as headsets require a slotting operation that would be impossible to perform in-cycle using just the X and Z travels, so would necessitate a second operation on a mill.

The lathe was installed in Newtown in February 2022, prior to which production of about 20 rotational parts was subcontracted out locally and pedal axles were bought in from overseas. A couple of other potential lathe suppliers were considered before the decision was made to purchase the Biglia. However, the specification of the Italian lathe, with its 30 kW/15 kW main/counter spindles and box ways in X and Z, with a



linear guideway in Z for speed, clinched the deal.

Tolerance is easily held on the 620YS. It is generally 0.05 mm but can be as tight as H7, 0.02 mm, on the bearing diameters of the now in-house-produced pedal axles, which are machined from 17/4 stainless steel of the top hardness grade, 11050.

Production of around 30 new aftermarket cycle products that are predominantly turned is planned for the lathe, which will soon be working a five-hour ghost shift at the end of each day thanks to automatic feeding of bar stock from a Hydrafeed Multifeed 80 short bar magazine.

The future

Andrew Cooper concludes: "The purchase of highly capable, multi-axis production centres such as the Brother and Biglia are the way forward for us and will underpin what I hope will be rapid growth. I predict we will treble our staff from three to nine people by the end of our next financial year in March 2023.

"As to my decision to opt for these machines from Whitehouse, it was partly down to the high-quality build and suitability for the intended applications. However, the support provided by the supplier was also a contributing factor. It included recommending a finance company, early help with establishing some machining processes and writing programs and the ongoing offer of unlimited training."

He added that other new equipment arrivals in the next few months will be a plastic 3D printer for producing components such as chain guides and a sand blast booth together with environmentally-friendly ceramic coating equipment to avoid the colour variability previously experienced when putting cycle parts out for anodising.

Whitehouse Machine Tools Ltd
Tel: 01926 852725
Email: timw@wmtcnc.com
www.wmtcnc.com

Smaller turn-mill centre for one-hit production of complex parts

The NTX series of B-axis turning and milling centres built by DMG MORI has been expanded by a new model at the smaller capacity end of the range, which now comprises five machines. The compact NTX 500 is able to turn components up to 558 mm long and 120 mm in diameter, or up to 40 mm diameter from bar, using its two Y-axis tool carriers and twin opposed 8,000 rpm turnMASTER spindles.

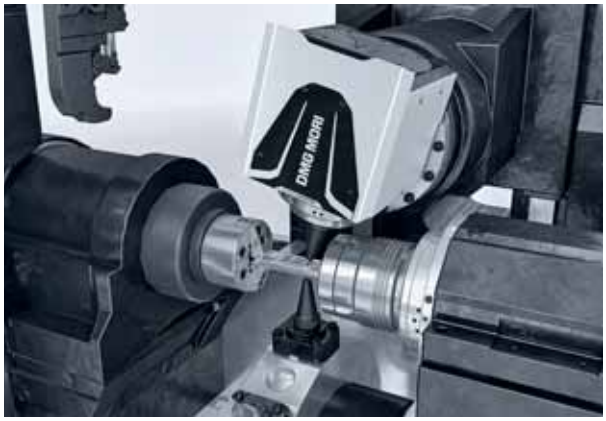
The size of the machine, coupled with its power and rigidity, make it especially well suited to the production of implants and other medical parts from challenging materials.

The NTX 500 is ideal for high-speed machining of complex workpieces, for example in the medical sector

The in-house manufactured compactMASTER B-axis tool spindle is rated at 30,000 rpm as standard, optionally 42,000 rpm. Being only 250 mm long, yet with a swivel range of ± 120-degrees and 150 mm of Y-axis movement, it allows generous axis travels and versatile metalcutting opportunities. The tool magazine can be loaded during machining and has pockets for 38, optionally 76 or 114, Capto C4 / HSK-T40 / KM40 cutters.

The NTX 500's second tool carrier is a BMT 42/64 turret below the spindle centreline with 16 tool positions and a Y-axis travel of 60 mm. It enables simultaneous machining together with the B-axis spindle for short cycle times when processing complex parts.

Automation solutions are available for the turning centre, including integrated bar feeding from the right-hand side and an In-Machine Travelling Robot (IMTR) that allows automatic workpiece unloading from the main and counter spindles.



Working area of the NTX 500, showing the upper B-axis tool spindle and lower turret

DMG MORI UK Ltd
Tel: 0247 651 6120
Email: steve.finn@dmgmori.com
www.dmgmori.com

Protecting your production with Kraft & Bauer

Many engineering companies may not have heard of Kraft & Bauer and yet most are end-users as their fire prevention equipment may be found protecting machines of all types. Major machine tool companies such as Index, Traub, Tornos, Walter, Ewag, Rollomatic and Reishauer fit these systems as standard and every year Kraft & Bauer UK retrofits its fire prevention units to machines of all kinds such as those made by Mazak and DMG MORI.

All UK engineering companies are urged to ensure that their machines are protected against fire risks as demanded to comply with the law and to make sure that the fire systems are covered under the mandatory annual service conducted by Kraft & Bauer specialists. These fire systems are not serviced as part of annual service checks carried out by the OEM machine tool companies engineers and in the event of a fire incident or insurance check a validated service certificate for each machine needs to be provided.

The consensus on risks of fire on machine tools is that any machine that uses oil, machines a self-combustible material, such as titanium or magnesium alloys when cutting dry without coolant or produces a spark, proposes a direct risk of fire and this must be protected against. End users of machines can access the "You and the Law" pages on Kraft & Bauer's website to learn more.

Besides injuries to persons, the consequences to engineering companies in the event of a machine tool fire may be high due to production stoppages leading to insolvency. Many engineering companies think that insurance is sufficient, but don't take into account that unless annual service certificates for the fire systems can be provided any insurance policy is likely to be invalid and even if it is and a claim is settled without delay, it would take many months before factories and machines may be replaced. Their customers will probably not be prepared to wait and would instead go and find alternative suppliers while they were still trying to recover from a fire incident.

Starting from a legal basis, the aim is to protect workers as comprehensively as possible against fire and explosion hazards during the use of machine tools and manufacturers of machinery and also users

of machine tools have key legal obligations. When using flammable metalworking fluids, the employer has the duty to determine within the framework of a risk assessment if a hazard caused by fire or explosions on machines is possible. For this purpose, when purchasing any machine tool, he should firstly ensure that the machine is compatible with the metalworking fluids intended to be used.

So what are the causes of machine tool fires? Most incidents are connected with the generation of incandescent chips, high-energy sparks or hot surfaces, which act as ignition sources. Root causes included broken or worn milling cutters, drills, turning inserts and grinding wheels. As a consequence of technical developments concerning machine tool feeds and speeds together with the trend towards low-viscosity metalworking fluids used at very high pressures, then the fire risk has increased dramatically in recent years.

In the immediate vicinity of the machining zone a reactive mixture of metalworking fluids and air is formed, which may be ignited by the above-mentioned ignition sources. The resulting fire propagates very quickly through the whole interior of the machine tool. The pressure increase accompanying ignition is less important than in the case of an explosion inside a totally enclosed machine. However, due to the pressure increase inside the machine, flame ejections may occur through gaps, pressed-open enclosure doors, feeding and

chip removal openings and pressure relief openings, if no relevant provisions are taken.

For the protection of machine tools, automatic fire extinguishing systems with gaseous extinguishing agents, commonly either carbon dioxide or, in case of machining titanium or magnesium, Argon Gas are used. The legal requirements for fire protection is that if a machine is ran automatically then a fully automatic fire system must be used and if a machine can only ever be ran manually then the fitment of a manually activated system is otherwise sometimes acceptable. However, in both cases the system must be fully integrated within the machine tool itself and having

hand-held or externally used systems is not acceptable.

Even when not using an oil-based coolant and dry machining titanium or magnesium-based alloys, a major fire risk still exists. The problem is that when being machined titanium can be prone to causing fires and explosions that can easily damage and sometimes destroy expensive production machinery. During machining, small particles of titanium can be heated up past the point of ignition and small piles of these particles will readily burn. However, when mixed with oxygen this burning can quickly extend from one particle to the next in a highly rapid manner and as the metal itself generates oxygen when burnt an explosion results. Laboratory tests have shown that very little titanium "powder" is needed to cause a catastrophic fire or explosion and any discharge of static electricity will produce an electric spark that will raise the particles of titanium past its ignition point resulting in an explosion. Electric switches on machine tools, loose electrical connections and any metal-to-metal contact is enough to produce a single spark that can set off an explosion. To make matters worse, the amount of heat generated when machining titanium does not dissipate quickly as titanium is a poor conductor of heat and therefore the hot spot is usually concentrated right back onto the tool or cutting edge and this often results in rapid breakdown of the tool itself.

The use of worn or damaged tooling will quickly generate a great deal of heat and result in the titanium catching fire. For this reason, it is always recommended to keep a close watch on tooling and change it before it starts to wear. It is not without reason that powdered titanium is used in pyrotechnics as a source of bright-burning particles.

The cutting of magnesium alloys offers similar problems to titanium as magnesium chips or dust is also classed as self-ignitable or easily flammable and as with titanium the machining processes offer such risk that, according to EU machine directives, production machines themselves should be equipped with fire detection and protection devices to avoid the risk of damage to machines and of course injury to operators. When heated, magnesium powder will ignite and will burn with a very intensive white light. Magnesium fire reacts very violently with and, cannot be extinguished by, water since hot magnesium reacts with the water to release hydrogen that will further feed the fire.

It is important that the chips created during the machining process are kept as large as possible and are not allowed to build up within the working area; the regular cleaning of machines is crucial as is the correct storage of magnesium swarf. Magnesium powder is used in the manufacture of incendiary bombs, fireworks and marine flares where a brilliant white light is needed; this light can be so intense that it can permanently damage the retinas of the eye.

It also has to be ensured that a fire is detected as early as possible and that the fire extinguishing system is activated without delay and the fire detection elements are a key criterion for fire protection. They must guarantee the safe detection of fires in a fast and reliable way and activate the extinguishing process via the control system. For automatic activation of the extinguishing system, thermal heat detection elements are used in conjunction with optical fire detection elements, Infra-Red or Ultra Violet light systems. These are placed within the machine and at other places, where fire hazards exist. The sensors are linked to both optical and acoustic alarms that must be at least 5 dB louder than the background noise to alert operators to the fire incident and to warn them to vacate the area.

Mandatory annual maintenance tests have the purpose of the timely detection and repair of damage as well as ensuring safe operation and these are also required by insurance companies.

Additional information on fire detection and extinguishing systems for all machine tools is available from:

Kraft & Bauer UK
Tel: 024 76 229477
Email: sales@kraftandbauer.co.uk
www.kraftandbauer.co.uk

Dugard is key to success for subcontractor

As a general subcontract manufacturer, Cannock-based Key Precision Ltd attended the Southern Manufacturing Exhibition earlier this year to investigate new technology to help drive the business forward. The company found the Dugard stand with the Hanwha range of sliding head-turning centres and an order soon followed.

The subcontract manufacturing company showed a particular interest in the Dugard Hanwha XD38II sliding head turning centre, a robust and sturdy sliding head machine with a bar capacity that is particularly large for the machine footprint.

Greg Jackson from Key Precision explains the purchase: "We were looking to expand our turning capacity by purchasing something with the flexibility of a sliding head machine but the capability of a fixed head machine as well. We saw the Hanwha machine at the Southern Manufacturing exhibition, and we were impressed, so we went for it.

"It was the relatively small footprint for the size of machine that attracted us and also the size of the bar that we can machine. The machine is made from a very solid casting and a lot of the design has been well thought out. The swarf conveyor has been integrated by the manufacturer, so there are no oil or swarf traps in the machine and there are no leaks. As a company that is limited for space, this is a great compact machine."

Looking at the type of parts the company is manufacturing on its new Dugard Hanwha XD38II sliding head turning centre, Greg Jackson continues: "At the moment we are doing parts at 35 mm+ diameter, but we are a typical subcontractor, so we make parts for cars, planes, trains and at the moment we are doing quite a lot of work the agricultural industry. This involves machining harder steels such as EN19 and EN24."

The rigidity of the new machine is already creating savings at Key Precision and some of these savings have been identified in the reduction in cutting tool consumption.

Greg Jackson says: "That has been a nice surprise for us. A lot of the jobs we produce are repeat jobs that we have machined many times over and, on these jobs, we have seen a tool life saving of 25 percent and even 35 percent when we machine them on the Hanwha XD38II. With costs continually rising, this is a welcome result that has made a big saving for us."

Incorporating the facility to work with or without the guide bush, this option on the Hanwha XD38II adds further benefits for Key Precision, as Greg Jackson states: "The big benefit on shorter components is the saving on the bar. Steel prices have tripled in the last two years, so any extra parts that you can get from the bar makes a very big difference. On a part that we are currently machining, it is a 35 mm diameter bar and the part is 10 mm long with the option of working with or without the guide bush we can get an extra 15 parts per bar. This is where it really starts to pay back.

"We are producing 10,000 banjo parts per month for fluid transfer systems using carbon steel and it's a nice easy job for a slider. The benefit of the Hanwha machine is its power. We are putting a 24 mm diameter U-drill down this particular component and that is large for a sliding head machine, but the machine has 32 mm sleeves which help us with our tool management. The machine

also has five powered tools and on the banjo component, this helps us for cross drilling into a bore. The rigidity of the machine makes the job simple and it is completed in 3-4 days."

Discussing another component, the company manufactures that is somewhat more complicated, Greg Jackson says: "This job is perfect for a slider as half of the machining is at the front end and

the other half is at the back end of the part. The component consists of heavy turning on the front end and some milling work on the back end of the part. We machine the part from EN24T and this can create stringy swarf on a slider, but the Hanwha machine has the power to chip the swarf while reducing our tooling consumption; it's been amazing. The bar is 40 mm in diameter and we are turning it down to an M18 thread. We are doing this in two passes, taking off 4 mm per side with our roughing pass at a 0.35 mm feed and the machine doesn't make a sound. The tool life is brilliant and it makes a difference when you can chip the material so well. This helps us to machine extremely quickly."

He concludes: "The machine has now been in and working for six full weeks. It has been running day and night and even over the weekends. It hasn't missed a beat yet and we are pleased with the machine."

C Dugard Ltd
Tel: 01273 732286
Email: sales@dugard.com
www.dugard.com

Latest machine tool investment vindicated

New horizontal machining centre investment opens up new business opportunities, helps boost productivity levels and improves operational efficiencies for leading precision subcontract specialist

Mills CNC, the exclusive distributor of DN Solutions, formerly Doosan Machine Tools, has recently supplied leading precision subcontract specialist, Endeavor Engineering Ltd, with a new horizontal machining centre.

The machine, a Doosan NHP 5000, was installed at the company's 9,000 sq ft facility in Didcot, Oxfordshire in November 2021 and joins nine other Doosan machines, three Puma lathes and five DNM vertical machining centres, previously acquired by Endeavor.

As intended, the NHP 5000 has significantly increased the company's milling capacity and, more importantly, its milling capabilities too. The new machine has already proved its worth and has been central to the company securing a number of new machining contracts with both new and existing customers.

Among these are new orders to machine bespoke lightweight aluminium vacuum chambers used for: drying, degassing, sterilising, cooling and distilling medications for the bio-pharmaceutical industry; building and testing semi-conductors; conducting controlled scientific experiments.

These new contracts would have been difficult to win and fulfill, using the company's existing, vertical, machining centre resource.

Endeavor's investment in the NHP 5000 is significant for a number of reasons: It was made during the pandemic at a time when many manufacturing companies had battened down the hatches and had either cancelled or postponed their CapEx investments. It was also the first horizontal machining centre to be acquired by the company in its 10-year history.

To understand the motivation and rationale behind its latest investment, it is important to know more about Endeavor, what makes it tick and why it has become so successful in such a relatively short space of time.

Endeavor Engineering was created in 2012 by directors Andy Strong and Martin Bell. It today employs 12 members of staff. Rather than becoming a 'me too' precision engineering company offering the same services as many other 'similar' subcontractors, both directors, at the very outset, shared a vision about the new enterprise and its future direction.

This vision, as relevant today as it was back then, is clear, unequivocal and powerful. It is focused on growth and on achieving differentiation by ensuring that the company's resources are directed to ensure the machining of high-precision and competitively priced components that are delivered on time, every time to customers.

Andy Strong explains: "Our aim and ambition is to provide customers with high-quality, best-in-class manufacturing solutions accessed from a single and reliable source."

Underpinning this vision is Endeavor's commitment to continuous improvement and its single-minded business approach. It constantly and systematically reviews and evaluates the market in order to identify emerging trends and capitalise on new business opportunities.

Andy Strong continues: "We are an ambitious company focused on growth and are constantly looking at ways to improve the services we provide to customers as well as strengthening our position within their supply chains. Our intention, always, is to become and be recognised as a vital and indispensable part of their business."

During the pandemic, the company was actively exploring ways to increase its floorspace and was investigating whether it could acquire an adjacent unit. If this occurred it would double the company's floorspace from 4,500 sq ft to 9,000 sq ft.

Martin Bell explains: "The increase in floorspace would help us increase our productivity levels and operational efficiencies by enabling us to improve the machine shop layout as well as helping us create dedicated office space and a separate assembly area. It would also enable us to comfortably site and install any new machine tools and new technologies we wanted or needed to acquire in the future."

The company did acquire the adjacent facility in autumn 2021 and, as a consequence, doubled its floorspace.

Endeavor regularly invests in advanced Doosan machine tools from Mills CNC and, prior to the pandemic, was seriously looking at expanding its already impressive milling operations still further. Andy Strong explains: "Rather than continuing to only invest in 3-axis vertical machining centres we began to consider multi-tasking machining centres, specifically 5-axis and horizontal machining centres. We were confident that having access to multi-tasking/multi-axis

machines with integrated automation would enable us to pick up new and different work from existing customers and win new machining contracts from new customers."

The outbreak of the pandemic and its impact on business reinforced and accelerated Endeavor's determination to augment its milling operations and resulted in the investment in the NHP 5000. The NHP 5000 is a linear guide horizontal machining centre that minimises non-cutting time. The machine has a rigid design and build. It is powerful, accurate and fast and delivers exceptional material removal rates. The machine's integrated thermal compensation and spindle and bearing cooling systems enables it to maintain high accuracies over long machining runs.

The twin-pallet NHP 5000 is equipped with two 500 mm x 500 mm pallets with B-axis indexing capability, a high-torque, BT 40 built-in spindle, 30 kW/15,000 rpm, a 60-position ATC and the 31i FANUC control. It also boasts 60 m/min rapids.

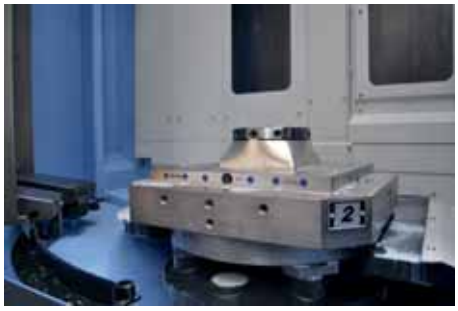
The machine was delivered to Endeavor with spindle and workpiece probing for in-process measurement and a high-efficiency swarf management system for improved process reliability.

Martin Bell says: "The NHP 5000 is a productivity powerhouse. The twin-pallet configuration enables us to set up jobs, on the free pallet, whilst machining takes place on the other. The B-axis indexing capability enables five-face/side machining to occur in a single setup. The fact that the machine is backed by Mills CNC's after-sales service and support was another determining factor."

The aluminium vacuum chambers machined on the NHP 5000 are characterised by their precision and complexity.

Andy Strong concludes: "We wouldn't and couldn't have entertained the idea of machining vacuum chambers and similar-type parts on our existing vertical machines.

"The number of different setups, re-fixturing operations and operator interventions required to machine the parts to completion on a vertical would have had a negative impact on the cost-per-part and would have tied up our vertical machining



centre resource creating delays and production bottlenecks.

"Instead, the NHP 5000, with its twin-pallets, large working envelope, powerful spindle, thermal compensation, generous sized ATC and efficient chip management system make it ideal for this type of work. With more and more work coming in for the NHP 5000, the decision to invest in our first horizontal machining centre has been vindicated."

Mills CNC Ltd
Tel: 01926 736736
Email: sales@millscnc.co.uk
www.millscnc.co.uk

Hidden benefit of Corporation Tax rise

The increase in Corporation Tax to 25 percent was met with obvious dismay from across industry, but for those that want or need to invest in new capital equipment the rise has a silver lining. The first-year 130 percent tax relief provided by the Super Deduction Scheme, that was introduced in April 2021, now provides a bigger incentive to re-invest in your business.

The Super Deduction can be applied to any new equipment with unlimited value, whether bought outright or on finance. "When applied to the new Corporation Tax rate customers can make significant savings on new machine tools," says Nigel Atherton, managing director of XYZ Machine Tools. "For example, the purchase of a machine tool valued at £100,000 would generate tax relief of £130,000. At the old rate of Corporation Tax that would save the customer £24,700. With the tax rate at 25 percent that saving increases to £32,500. If you kept the £100,000 of profit in the bank, it would cost you £25,000 in tax instead."

Nigel Atherton continues: "The manufacturing sector has proved to be extremely resilient throughout and post-lockdowns. Therefore, the announcement of increases to Corporation Tax and National Insurance did come as a blow. However, we have to look for the positives and if in a position to re-invest profits back into the business the added incentive of the Super Deduction Scheme provides that silver lining."

Leading from the front, XYZ Machine Tools has continued to invest in its own business in order to maintain its levels of service to customers whether through increasing the number of employees in customer facing roles or, continuing to provide its extensive range of machines. The vast majority of which are available ex-stock from

its Burlescombe, Devon headquarters. With HMRC's Super Deduction Scheme providing enhanced tax relief on capital investment, there has never been a better time to buy a new machine tool.

XYZ Machine Tools
Tel: 01823 674200
Email: nigel.atherton@xyzmachinetools.com
www.xyzmachinetools.com

Driven to succeed with a little help from CERATIZIT workholding

In under seven years, Driven Engineering has grown from a one-man operation with just a second-hand 3-axis machining centre into a thriving sub-contract manufacturing business on the back of founder Ray Harris' commitment to invest in the company's future.

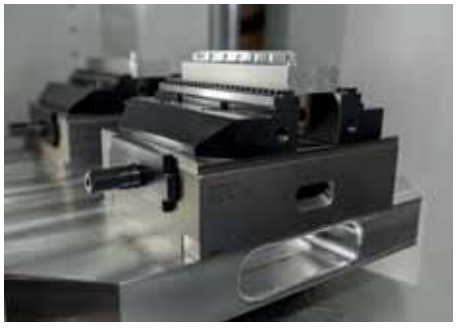
Within six months of buying that first second-hand machine in 2015, Ray Harris had extended his machining capacity to include 5-axis capability. Within a further 12 months, still operating as a one-man business, he invested in a brand new Hermle machining centre, which was followed in 2019 with a further machine with a 12 position, 320 x 320 mm pallet system. Taking a short pause for consolidation, it was in 2021, in the middle of the pandemic, he decided more space was required so a relocation to its current Havant facility took place. At the same time an order was placed for a second pallet loaded machine, this time with 50 pallets and 240 x 170 m capacity. In total the company has invested around £1.3 million in machining capacity to create a 24/7 operation, along with supporting systems such as Hypermill software to enhance productivity. Quality control is also a focus with existing measuring arms being supplemented with future investment in a CMM.

"Making the decision to relocate amidst the pandemic wasn't ideal, but it was a positive one that needed to be taken. We completed the move in eight days ensuring minimum impact of workload and cashflow," says Ray Harris. "At the same time we also ordered the second pallet loaded machine. The smaller pallets suit the work we do in the motorsport sector and having the multiple pallets allows for lights-out machining. We now have capacity to run for an entire weekend unmanned."

The type of components machined by Driven Engineering lend themselves to be gripped in vices, rather than fixtures, which is where CERATIZIT UK & Ireland plays its part. In addition to providing cutting tools, it has also been instrumental in kitting out the pallets with its latest ZSG4 vice system. The ZSG 4 vice has several benefits, but key to Driven Engineering is the ability to grip billets on just 3 mm of material.

"Using such a small amount of material for gripping allows us to program the part using the bottom of the billet as the datum, we also get great access to machine five sides of the part. In addition, they deliver consistent grip and accuracy making them ideal for unmanned machining."

In total CERATIZIT has supplied Driven Engineering with 75 ZSG 4 centric vices, in a combination of 125 mm and 80 mm widths. Each vice is capable of applying up to 35 kN of gripping force, which allows the minimum grip depth of 3 mm. A further advantage is the lack of any requirement for billet preparation prior to gripping, unlike other systems on the market. Their suitability for pallet-based machining is enhanced by their compatibility with PNG, MNG and Lang zero point clamping systems.



Driven Engineering's core business is in support of the motorsport sector, due in part to Ray Harris' own racing ambitions where he has manufactured parts for a Ginetta G55 car he races in the British Endurance Championship and his own car that he competes with in the Intermarque Silhouettes championship. Outside of parts for these cars, Driven Engineering was also involved in the development project for the HALO devices found on many open cockpit racing cars. These complex parts were machined using CERATIZIT'S CCR, HFC and Silverline, ballnose, cutters.

Ray Harris concludes: "We benefit from CERATIZIT's online support and face-to-face interaction in order to generate the correct cutting data, with our local technical sales representative, Lee Pinhorne, on-hand to support us with new projects. This is especially valuable as we diversify into other sectors of the market and encounter materials that we haven't machined before. Further support is provided by the CERATIZIT tool vending system that Driven Engineering has installed. This helps to maintain production, with tools being available 24/7."

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Tungaloy gets groovy with new turning line

As part of its ADDFORCE global launch of next-generation cutting tools, Tungaloy UK has now introduced the exciting new AddInternalCut to its product portfolio. The new AddInternalCut is an industry first, introducing four cutting edges on an internal grooving tool for precision turning and small part machining applications.

The R&D experts at Tungaloy have developed a unique new clamping system that is incorporated into the tool body to provide an astounding level of clamping rigidity and indexing repeatability and precision. The new AddInternalCut supports the four-edged insert in three positions with each of the cutting edges protected by the ingenious new pocket design. Furthermore, this design allows end-users to use the same insert on a right or left-hand tool body.

The AddInternalCut is available with a steel or carbide tool body with a necked relief of 24 or 30 mm to provide sufficient clearance and swarf evacuation. The round tool shanks also have 12 mm flats to correspond with everything from sliding head turning centres through to larger more robust lathes. The through coolant tool bodies are optimally manufactured to reduce vibration and chatter with an overall tool length of 100 or 125 mm and an insert seat size of 10.

To ensure the new AddInternalCut is suitable for the widest possible audience, Tungaloy has developed the range with its CWN and CWX insert designations. The CWN is 1.5 mm wide with the heavier duty CWX being 2.5 mm wide. Depending upon the chosen insert geometry, the AddInternalCut provides a protrusion for cutting at depths up to 2 mm. Both insert geometries are available in Tungaloy's AH725 insert grade that is PVD coated. This makes the new AddInternalCut the first choice for cutting a wide variety of steels, stainless steels and challenging aluminium alloys such as titanium. The geometry of the inserts guarantees a sharp cutting edge for maximum precision while the ground-to-form chipbreaker enhances groove precision whilst working in tandem with the through coolant facility to evacuate the swarf.

Perfect for cutting inside holes from as small as 10.5 mm diameter and upward, the AddInternalCut is available with right and left-hand toolholders. Not only is the AddInternalCut a flexible system, but its highly rigid clamping design also maximises rigidity and clamping forces to extend tool life, precision and repeatability. With the system also being a four-edged series, the AddInternalCut is the most economical grooving line in the industry.

Tungaloy adds force to parting applications

As part of the global launch of the next generation ADDFORCE cutting tools from Tungaloy UK, it has now launched its new AddForceCut range of grooving and parting-off turning tools. The impressive new series introduces an optimally designed self-clamping technology that demonstrates exceptional rigidity for enhanced performance.

The new insert clamping design from Tungaloy has a stopper that supports the underside of the insert to guarantee edge position, security and repeatability. Furthermore, this new design spring clamps the insert with three contact faces to maximise this level of stability. The result is smooth uninterrupted chip flow that is a credit to two variations of effective 3D chipbreakers.

To maximise the potential of this new line, Tungaloy has developed the series with four toolholder options comprised of an interchangeable blade system with toolholder, the TungFBlade with a triangular interchangeable blade design that accommodates three inserts, a solid single insert toolholder and also a modular head system for cutting at 90 degrees. The QSP blade system for deep grooving and parting is available with 150 mm long blades that have widths of 1.8, 2.4, 3.2 and 4 mm depending upon the seat size selected that ranges from 2 to 5 mm. The blades are provided in heights from 26 to 32 mm with a depth from the insert tip to the base of the blade from 21.1 to 24.4 mm to optimise the rigidity and strength of the system when parting off larger diameter parts.

The QSER toolholder blocks for clamping single inserts are available with block sizes of 20 by 20 mm and 25 by 25 mm and an overall length of 125 or 150 mm to suit all turning centre configurations.

Tungaloy UK Ltd
Tel: 0121 400 0231
Email: salesinfo@tungaloyuk.co.uk
www.tungaloy.com/uk

New Cubic Boron Nitride tools from Horn

Horn has announced an expansion of its product portfolio to include tools tipped with Cubic Boron Nitride (CBN) for machining difficult materials such as superalloys and hardened steels. The ultra-hard material is capable of smooth machining even during interrupted cutting when hard turning and grooving. By extending its existing standard ranges of Supermini 105, Mini 11P, 229 and 315 systems, Horn is able to deliver the CBN tools quickly from stock.

The Supermini system is available in left- and right-hand versions with different corner radii. The CBN-tipped variants are for internal machining from a diameter of 2 mm. Different lengths of solid carbide body are available. Tools in the Mini family can be used from an internal diameter of 6.8 mm and are also available in left- and right-hand versions.

The single-edged tool type 315 is for external grooving from a width of 0.5 mm. In the cutting insert system 229, the previous CBN substrate CB 50 is replaced by the higher performance substrate CB 35. Inserts are available with two different corner radii and cutting widths from 3 mm to 6 mm.

CBN is the second-hardest material after diamond. Tools made from CBN wear much more slowly than other cutting materials when used appropriately. It is consequently possible to achieve higher dimensional and profile accuracy, even when machining hard materials such as steel up to 70 HRC.

There are no different grades of CBN. Differentiation between tools is down to the CBN volume fraction, the fillers, grain size and the ceramic/metallic binder phase, cobalt/nickel. This results in different CBN substrates. Hard machining is usually carried out without coolant, as these cutting materials have high heat resistance and the elevated temperature within the chip formation zone has a positive effect.

Whereas carbide suffers a significant loss of hardness at around 800°C, the hardness of CBN remains almost unchanged at temperatures up to 1,200°C. Another significant advantage is good chemical resistance, even at these high temperatures.

Horn is expanding its tool portfolio to include CBN-tipped tools for machining hard materials

Horn Cutting Tools Ltd
Tel: 01425 481880
Email: info@phorn.co.uk
www.phorn.co.uk

Lang RoboTrex 'braking' HEL Performance records

Renowned globally for its comprehensive range of robust workholding products, Lang Technik is now also earning an excellent reputation for the highly efficient, 'lights-out' production capabilities of the company's RoboTrex automation systems. The recent installation of an advanced Lang RoboTrex robotic system at the production facility of motorcycle and automotive brake aftermarket specialist, HEL Performance, is now enabling one of the company's Brother VMCs to run unattended 24 hours a day, seven days a week.

After gaining vast experience within the hydraulics industry, Simon Lane purchased the Hose-Equip company in 2000. The name Hose Equip Ltd was soon shortened to HEL, and the now famous HEL Performance brand was born. Following the acquisition, the new owners introduced an innovative new approach to the design and manufacture of motorcycle brake lines and established the foundations for the business's current international success.

Having shunned the use of mild steel and aluminium, as metals that invariably corrode, HEL Performance system began to use only stainless steel and titanium and became the first fully swaged brake lines in the UK market. As a pioneer in the use of superior materials and fully swaged brake lines, the company remains at the forefront of the design and manufacture of safer, permanently attached brake line fittings.

To remain one step ahead of the competition and to keep pace with technological advances, over the last five years HEL Performance has invested over £3 million in new machine tools and related technology. Rising OEM business prompted the establishment of a standalone CNC milling department and the purchase of two Brother S700X1 machine tools and a Brother M140X2 machine. Following the M140X2 VMS's installation, motivated by ever increasing demand for the company's in-house manufactured calipers and master cylinders, HEL performance director Simon Lane undertook a search for a highly-efficient robotic system that would allow the advanced Brother machine to operate unmanned around the clock.

Having dismissed several less efficient alternatives, a short-list of three high-quality automation systems, including a RoboTrex 52 robotic system from Lang Technik, was compiled. As each of the considered systems contained elements of Lang Technik technology and, as Simon Lane was already aware of the company's reputation, an order was quickly placed with Lang Technik UK for the RoboTrex 52 system.

Following its trouble-free installation and operator training, the highly-efficient robotic system now operates unattended throughout each day, loading workpieces and unloading fully machined parts from the company's Brother M140X2VMC. At the end of each day shift, the systems storage trollies are restocked with further batches of workpieces, allowing the machine tool to operate unmanned throughout each night.

Simon Lane explains: "We have led our industry forward by pioneering radical concepts and designs in addition to advancing our manufacturing capabilities. Through our developments, we've created safer and more durable products. Over the

past few years rising global demand for our products has inspired us to invest in a range of cutting-edge machine tools and associated equipment. Our highly-efficient Lang RoboTrex system has been a great success in this area. The system's installation and integration was trouble-free and as it is so easy to use, operator training was also very straightforward.

"Now, by ensuring that our M140X2 is able to produce master cylinders and calipers 24 hours a day, seven days a week without stopping, our Lang RoboTrex system has enabled the full productive potential of the Brother VMC it serves to be achieved. In fact, the combination of the Brother VMC and the Lang RoboTrex system has allowed us to break all of our previous efficiency records for the production of our cylinders and calipers and enabled us to keep-pace with ever increasing customer demand for our products."

Lang Technik UK director Gareth Barnett concludes: "Strong competition, cost pressures and a shortage of skilled labour are some of the challenges UK businesses are currently facing. This is why a degree of automation is now being seen as an answer to increasing productivity, boosting operational efficiency and, by extension, remaining competitive. Almost any machine tool, whether new or already in use, can be automated with the use of a RoboTrex system and our automation systems cover every need from single part machining to large-scale series production.

"Given the nature and cycle times of HEL Performance's parts we were confident that the RoboTrex 52 system was the ideal solution to the company's needs, as dependant on workpiece size, each of the system's trolleys is able to hold between 30/42 vices, each loaded with workpieces. As the RoboTrex 52 system is able to accommodate four trolleys with a total storage capacity of 120/168 vices, the automated system is able to undertake 'lights-out' productive throughout each night.

"It helped HEL Performance's staff that, thanks to its easy-to-use operating system, no robotics knowledge is necessary. Therefore specialised personnel are not needed and operator training is minimised. A simple to operate touch panel enables easy control of the automated system and, as external access to the trolley is possible, production remains seamless as machining cycles do not need to be interrupted."

LANG Technik UK
Tel: 01296 796 576
Email: sales@lang-technik.co.uk
www.lang-technik.co.uk

FANUC shows commitment to Ireland's Industry 4.0 and Future Jobs strategy with dedicated new robotics facility

Roughly a year after FANUC announced, in June 2021, that it intended to serve customers from premises in Ireland with a dedicated team and full local representation, this summer will see the robotics and automation company collect the keys for its new facility in Maynooth, Co Kildare. Off the back of a strong start to this fiscal year, the company is demonstrating a strong commitment to its growing Irish customer base, supporting the government's aim to place the country at the forefront of the Fourth Industrial Revolution by 2025.

"We announced that we planned to have an initial team of five and here we are, as promised," says Conor O'Kelly, one of two Ireland-based sales managers now in place, the other is Ronan Rasdale. Two service engineers and a technical support engineer complete the team.

There have been plans for an Irish subsidiary of FANUC Europe for a while, but the impact of COVID-19 and the restrictions on international travel accelerated them. "Previously, our Irish customers would have had to travel to Coventry in England. However, we can now offer organised, in-house training for our larger customers and scheduled courses catering for smaller groups, from our dedicated Irish facility here in Maynooth," continues Conor O'Kelly. "In addition, the showroom at our new headquarters will be stocked with robots for demonstration, evaluation and test purposes."

Most of the island is reachable from Maynooth in about three hours and many of FANUC's customers and partners are within 90 minutes' drive of the new facility. Its launch could not be timelier, coinciding with the implementation of the Irish Government's wider industrial strategy. According to the 'Making it in Ireland: Manufacturing 2020' report, Ireland's manufacturing sector contributes 25 percent of GDP and employs 205,700 people directly, rising to 400,000 when indirect employment is considered.

FANUC believes that it is ideally placed to help Irish businesses close the gap and profit from the new opportunities, supported by its network of expert integrator partners.

FANUC UK Ltd
Tel: 024 76053130
Email: marketing@fanuc.co.uk
www.fanuc.eu/uk/en

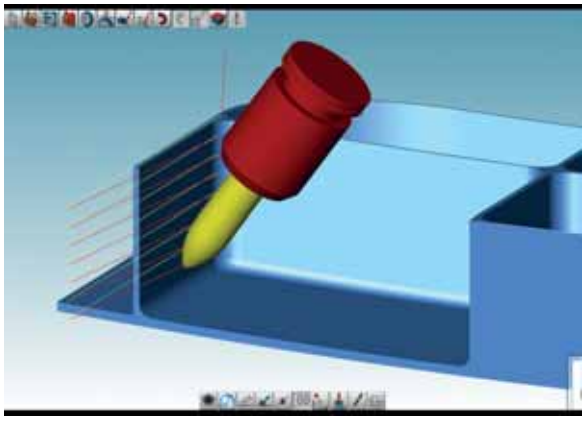
CAM software technology keeps pace with aerospace challenges

Aerospace industry component manufacturing is in a large growth cycle. Advancements in materials and engine efficiency have created clear benefits for replacing a surplus of older aircraft equipment. The advancements cover both the engine and structural components. The demand is so significant that machine tool manufacturers are challenged to supply the equipment fast enough. Since OEMs and suppliers already operate at a high utilisation rate, there has been growth at existing facilities and an increasing number of new certified vendors with the high demand expected to continue for many years. This challenge can be met by increasing the number of spindles or also by increasing the productivity of tooling, work holding and CAM software solutions. Enhancements to these support technologies can increase the productivity of existing equipment.

CAM software for aerospace machining

There are many CAM software products available and most of these have targeted capabilities. The focus may be on a process such as 5-axis milling, mill/turn, or wire EDM. Or the CAM software may be optimal for applications such as mould and die or aerospace applications.

Not many aerospace machining companies, especially tiered vendors, machine all types of aerospace components. However, some do and certainly, aerospace OEM companies tend to machine a wide array of aerospace parts, even if only for development components.



Therefore, the ideal CAM software for aerospace manufacturers has to excel at high material removal rates with the machining of aluminium structures working well with the high precision requirements of compressors and turbines that are often machined with long slender tools.

Requirements for aerospace machining

Machining of aerospace components requires excellence by the manufacturer to adopt and carefully follow procedures to ensure quality, repeatability and traceability. The components required in this industry have very stringent and varying requirements. Structural components must be lightweight and generally made from aluminium or composites. Engine components and landing gear are generally made of titanium, steel or nickel-based superalloys. These materials focus on strength and temperature resistance. For engine components, titanium is used where possible as the material density is nearly half that of steel or superalloys. It also helps to control weight.

Machining strategies for structural components

High-performance roughing is necessary to bring aluminium blocks or plates to a near-net shape. Up to 90 percent or more of the block weight may be removed during roughing processes. Not only is this important in typical 3-axis structural components, but it is equally crucial in 5-axis components. Many CAM software programs have a high-performance roughing module. Here, OPEN MIND offers its hyperMILL® MAXX Machining roughing module. This machining approach is based on Celeritive's Volumill™ kernel but has been extended by OPEN MIND to have an application for 5-axis roughing. In cases of shaped structural components, some wing segments for example or doors, a 5-axis roughing process provides a huge benefit to subsequent machining processes. Following high-performance roughing operations, innovative finishing techniques can have a big impact on results.

The surfaces of standard structural parts are machined with a swarf milling operation, with the side of the cutter aligned to the side of the part. This process enables very good performance, but it is limited to 'short' wall surfaces typically up to 50 mm in height. For larger wall surfaces, the swarf milling operation may lead to vibration in the cutter or the wall surface, or multiple steps with

overlap and inconsistent deflection patterns. In these cases, or other cases that do not have ruled surface walls, the next best option is point milling in many passes by using the tip of a ball-nose endmill with a small step-over. This point milling method increases cutting time dramatically.

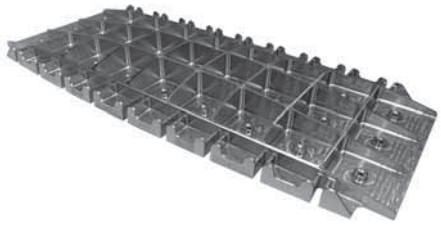
Recent innovations include applying barrel cutter geometry to these surfaces. OPEN MIND's hyperMILL MAXX Machining finishing approach uses a conical barrel cutter to enable a barrel contact radius of 1,000 mm or more, thereby producing a wider step-down of 10 to 15 times compared to that of a ball-nose endmill. This enables the cutting time for these surfaces to be reduced by 90 percent or more. The conical barrel cutter has a large barrel radius ground on a tapered feature, compared to a traditional barrel cutter where the large radius blend is at a tangent to the cutter shank.

hyperMILL MAXX Machining and conical barrel cutters enable a large contact radius and clearance from wall surfaces The benefit of having the taper angle is that the tool axis can be pulled away from the surface being cut. The result is a shorter and stiffer setup without interference from the cutter holder. The machining benefits far outweigh the increased cost of conical barrel cutters, especially in aerospace production applications. Though the tangent barrel cutter provides some benefits, the conical barrel cutter is generally superior. This enables a larger barrel radius and allows for shorter cutters without interference from the cutter holder.

Conical barrel cutters exhibit long tool life and very consistent machining performance. In addition, the ball end on the tip of the conical barrel cutter can be used to clean fillets and blend surfaces, using the same cutter.

Machining strategies for aerospace engine components

Engine components are generally classified into two categories: multi-blade and single



blade. The difference is that multi-blade components are produced as a monolithic shape from one stock while single blade components are machined as individual airfoils with mechanical attachment features. These are then mechanically assembled to make engine components. Engine components face high temperatures and stresses and potential impact, so materials like titanium, steel and superalloys are used.

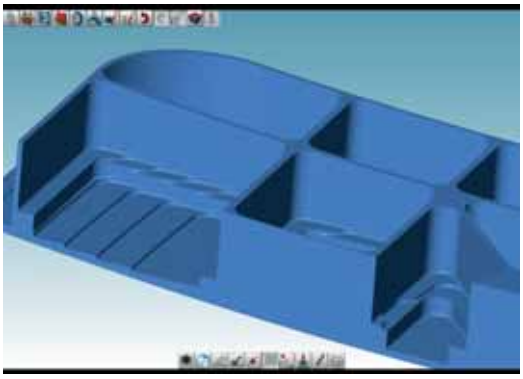
An assembled turbine or compressor from machined single blades and a hub disk weighs more than a one-piece compressor or turbine blisk, bladed disk. As engine performance is directly related to its weight, blisks have become more common than single blades in recent generations of engines.

Single-blade machining can start from a rectangular block, cylindrical stock, or near-net forgings. Roughing as always is a critical task to control costs, and also to set up for finishing operations. Due to various starting stock shapes and irregular finishing shapes, stock tracking is essential during roughing operations to avoid wasteful air cuts. As blades can also be twisted, multiple cutting orientations should be used during roughing to leave minimal stock for the finish.

Single-blade finishing is historically performed with ball nose endmills, especially on twisted surfaces and near attachment platforms. Open areas of the blade surface are often cut with a tilted bull-nose cutter. This cutting style gives a large effective radius of curvature and can produce a fine surface finish with fewer passes compared to a ball-nose endmill. As with structural components, recent developments with conical barrel cutters further extend the benefits of using a large contact radius with a stable and controlled machining process.

Finishing of multi-blade components raises additional challenges due to tight blade spacing and requirements for high aspect ratio cutters. The CAM software must possess robust collision detection and avoidance techniques to find a solution to the close spacing between blades.

Due to the small cutter radius that is allowed based on blade spacing and fillet geometry and the fine surface finishes required to meet design specifications, hundreds of passes around the blade may be required to attain the needed surface finish using a ball-nose endmill. Applying these long path lengths against hard metals is time-consuming and leads to cutter wear and concerns for manufacturing



consistency. Some engine manufacturers change a cutter for each subsequent blade surface to assure consistency of wear and reduced imbalance of the resulting machined part.

Twisted multi-blade surfaces typically do not allow the use of swarf milling process. Conical barrel cutter solutions are also being applied to achieve cycle time and quality improvements. The larger step-over for conical barrel cutter processes means less overall path length and tool wear compared to ball nose endmills.

Both single-blade and multi-blade components can be classified with feature-based and family-of-parts, macro, programming. In both cases, there are repeated geometry selections of curves and surfaces.

CAM software has a large influence over machine tool performance, so users can gain benefits by selecting the proper CAM software for the application at hand. The most advantageous CAM software is continually evolving with each new version release to offer enhancements and innovations which keep up with the requirements of aerospace manufacturing.

OPEN MIND Technologies UK Ltd
Tel: 01869 290003
Email: info.UK@openmind-tech.com
www.openmind-tech.com

Hexagon announces new smart manufacturing platform

Hexagon's Manufacturing Intelligence division has announced the Nexus open platform for smart manufacturing, which will revolutionise how technology professionals collaborate and innovate

Announced at Hexagon's HxGN LIVE Global 2022 conference in Las Vegas, Nexus will enable real time data sharing between different design, simulation and production applications. It will connect different applications to form workflows and combine technologies to develop unique solutions to engineering and manufacturing problems, from concept to delivery. It will empower cross-functional teams to leverage fragmented digital data by improving visibility and connectivity and help them gain unprecedented insight, bring their ideas to life faster and produce higher quality results.

The platform will connect people, technology, and data across the design, production and manufacturing workflow to streamline information sharing, drive quality and optimise operations. Teams will be able to innovate using its cloud-based technologies, applications, and solutions to accelerate new product development.

Nexus is the foundation for Hexagon's new solution offerings in the smart manufacturing space going forward. Today, it is capable of leveraging Hexagon data sources from across the vast portfolio; connecting hundreds of Hexagon design and engineering, production and metrology software tools and unlocking new insights from metrology devices and connected machines. Additionally, first-in-class cloud-native visualisations and data management solutions such as HxGN Metrology Reporting and MaterialCenter have been built as cloud-native connected applications and will be connected through Nexus.

Hexagon is also developing purpose-built solutions through the platform that combine multiple technologies to help users to improve productivity and digitally optimise complex processes and workflows. One example is a "ready-to-go" workflow for 3D printing an optimised reverse-engineered part that could be used, for example, to streamline the repair of grounded aircraft components.

This workflow connects data from a 3D laser scan to Hexagon products such as RECreate, MSC Apex Generative Design, MaterialCenter and Simufact Additive, as well as connecting to a third-party market-leading application called CADS Additive to significantly improve productivity and enable rapid collaboration to address production issues.

Parth Joshi, chief product and technology officer for Hexagon's Manufacturing Intelligence division, says: "Our customers are managing increased complexity in the market, which is demanding faster innovation than ever. Siloed tools, rigid systems and inaccessible data are increasingly ill-suited to the manufacturing industry's needs and pressures.

Our vision for Nexus is to enhance the products our hundreds of thousands of customers have come to know and love with additional capabilities, powered by the Cloud, AI and Machine Learning, real time collaboration and advanced visualisation.

"Nexus will allow manufacturers to build more agile and resilient processes so they can respond positively to change and take advantage of new opportunities, create faster pathways to products and develop increasingly autonomous workflows. They will realise the full potential of smart and sustainable manufacturing."

To learn more and sign up for updates, visit:
https://www.hexagonmi.com/nexus

Hexagon is a leader in digital reality solutions, combining sensor, software and autonomous technologies. It is putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector and mobility applications.

Its technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous in order to esnure a scalable, sustainable future.

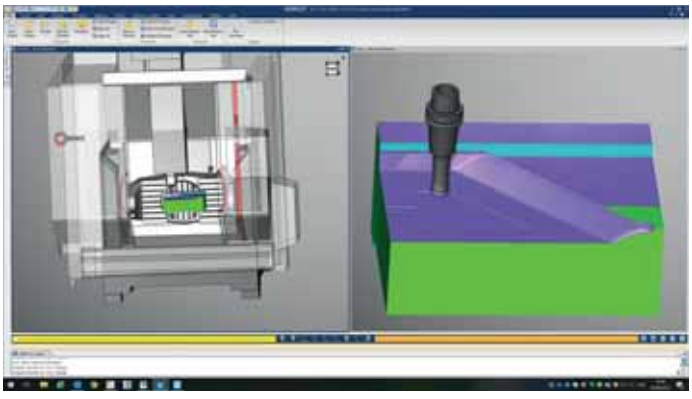
Hexagon's Manufacturing Intelligence division provides solutions that use data from design and engineering, production and metrology to make manufacturing smarter.

The company works with its customers to improve productivity by embedding quality throughout the product lifecycle. Its technology enables manufacturers to take control of quality at all the key stages of their process. Through an unparalleled portfolio of digital manufacturing technologies spanning CAE solutions for design and engineering, CADCAM and complementary software for production applications, metrology hardware and software solutions, as well as data management and analytics tools, it empowers technology users throughout the process with deep and actionable insight into product quality, ensuring that quality drives productivity.

Hexagon
Tel: 0870 4462667
Email: enquiry.uk@hexagon.com
www.hexagonmi.com

Multi-national OEM relies on VERICUT for mould tool machining

PLASSON, a multi-national manufacturing business headquartered in Israel, relies on VERICUT CNC machine simulation, verification and optimisation software from CGTech to ensure high-quality, reliable and highly productive mould tool machining operations. Enhancing the manufacture of the company's injection mould tools and associated parts, VERICUT is today embedded into machining procedures at this progressive OEM after more than two decades of continuous use.



As a leader in the design and production of flow solutions, livestock equipment systems and products for bathrooms and kitchens, PLASSON maintains a tradition of over 50 years of excellence and innovation. Formed in 1963, quality is the key concept in all of its processes, from development and design through production, assembly, packaging, distribution, delivery and aftersales services. The company has a strong global presence, operating in more than 100 international markets, with approximately 2,000 employees and over 25 subsidiaries worldwide, including one in the UK in Burgess Hill.

PLASSON constantly aims to develop added value and stand at the forefront of technology in the development of innovative products and solutions that suit the ever-evolving needs of its customers. Such a philosophy relies heavily on the company's in-house mould tool machining capabilities, which is where the capabilities of VERICUT come to the fore.

"We've been using VERICUT for over 20 years," states Itamar Minerbo, mould department manager at PLASSON. "It was originally introduced because we didn't feel that we could fully trust the post processor. We were finding some differences between the CAM software simulation and the G-code files, where the software simulation didn't show any problems. In contrast, running a VERICUT simulation shows very clearly whenever the tool follows a different path according to the G-code. For sure we've protected many mould tools against damage since installing VERICUT."

The importance of protecting both components and expensive machine tool assets at PLASSON should not be underestimated. Although the company only ran two 4-axis CNC milling machines when it first introduced VERICUT more than 20 years ago, today PLASSON has two Hermle 5-axis CNC machining centres on site and a brand new multi-axis Nakamura turn-mill machine.

CGTech Tel: 01273 773538
Email: info.uk@cgtech.com www.cgtech.co.uk

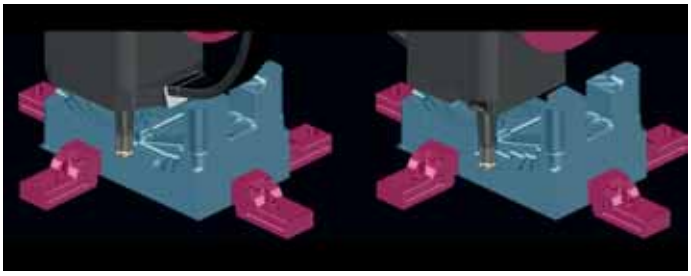
Tebis announces new features in its integrated digital twins technology

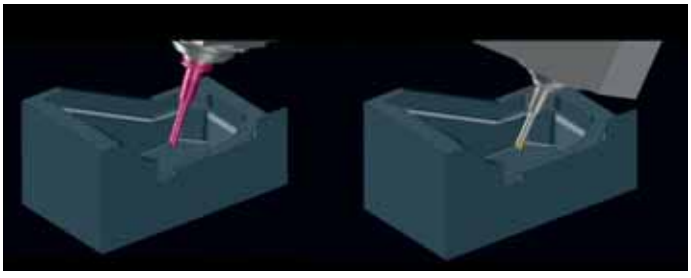
Tebis, the specialist CADCAM and MES solution provider, offers its customers a fully integrated solution that detects and resolves potential collisions using digital twins technology in the CAM environment. It has added more features to this well-proven approach in Version 4.1. The option for machine head collision checking is now also fully integrated in the Tebis virtual machine model, along with new functions for 5-axis simultaneous avoidance milling.

Integrated digital twins technology for collision avoidance

"The earlier in the process chain that collisions are avoided, the better. Because detecting and avoiding potential collisions at later stage almost always results in unwanted downtime and unnecessary costs," explains Fabian Jud, product manager at Tebis: "Tebis approach is proven and safe. It verifies toolpaths and avoids collisions within the CAM environment. This is achieved by using digital twins of the real manufacturing environment."

The real-world machining environment is reproduced precisely in the virtual world by Tebis to ensure that the integrated collision checking functions safely. This includes all geometries, including machines, tool assemblies, clamping devices and limit switches. Tebis completely eliminates simplified substitute geometries as the basis for the NC calculation is usually the accepted machine model. This enables a digital twin of the real NC code to be generated in the CAM environment.





CAM programming with intelligent collision avoidance strategies

Collisions that can be detected while calculating the NC program can be immediately identified and avoided with the appropriate collision avoidance strategies. The most appropriate strategy depends primarily on the specific component geometry, the machining task and especially the available machine. This knowledge should be stored in NC templates. This means that the CAM programmer only needs to select the machine and machining elements. The appropriate collision avoidance strategy, with area

reduction, simultaneous 5-axis avoidance milling or indexed machining is then automatically assigned in each case.

Benefits of the Tebis approach

Additional user operation and correction loops are avoided. This approach is easier to man-age, because the CAM programmer doesn't need any special knowledge of machine code or other simulation software. No manual corrections to the NC code that could place process safety at risk are necessary while planning is easier as the CAM programmer has access to all the virtual manufacturing components that are represented in virtual digital twin database libraries.

The machine head is fully accounted for in collision checking/automatic area reduction

In the event of potential collisions with the machine head, milling areas are now automatically reduced or excluded from the machining operation in the NC calculation.

Automatic area reduction is generally used in 3-axis roughing. Milling areas that cannot be machined with the tool in use, because of a collision with the machine head, for example, are automatically deactivated. With the new area reduction, users employ the shortest possible tools for each milling job which ensures optimal cutting conditions.

The head or table can also be rotated interactively around the C axis during the calculation in the machine kinematics. The benefit is especially clear for asymmetrical heads. The maximum amount of material is removed with the selected tool and unnecessary residual stock is avoided. The interactive rotations are immediately accounted for in the area reduction.

Additional avoidance milling functions

Given an appropriate machine and control, 3+2-axis programmed toolpaths can also be automatically converted to 5-axis simultaneous toolpaths for collision avoidance. One of the special features in Tebis is that the tool movements can also be controlled interactively with vectors. The user can therefore optimally adapt the cutting conditions to the specific machining situation. The vectors determine the tool tilt direction and pivot movement.

Tebis (UK) Ltd Tel: 024 76 158178
Email: info@tebis.co.uk www.tebis.com

Hypertherm announces release of ProNest 2023 CADCAM nesting software

Hypertherm, the US-based manufacturer of industrial cutting systems and software, has announced a major version update to ProNest® 2023, its advanced CADCAM nesting software for automated cutting. This new release contains a collection of new features and on-going enhancements designed to help customers improve their operational efficiency while reducing non-value-added tasks.

ProNest 2023 includes full functionality for PlateSaver™, a SureCut™ technology that combines the arc stability of X-Definition® plasma with specialised software parameters to dramatically increase material utilisation when cutting mild steel. In addition, it contains enhancements to ProNest's Production Manager, a web-based module that seamlessly integrates with Hypertherm's EDGE Connect® CNC to automatically capture real-time machine data. Enhancements include the ability to edit production times for completed nests, set job status changes and search for nests by customer. There is also a feature that merges XPR setups. The software will now automatically detect and merge changes made to the process parameters or bevel spreadsheets into a new setup during installation. Customers can choose to use their existing customisations or the latest factory cut charts.

Finally, the software is even easier to use. Changes to the user interface include a new welcome screen and customisable ribbon. The welcome screen contains an informative dashboard that highlights training videos, application tips, and other valuable resources while the ribbon allows users to add, remove and rearrange tabs. Customers can save different ribbon configurations and easily switch between them as needed, to best fit their workflow.

"Our software developers have really focused on reducing the waste inherent in most cutting operations. Features like PlateSaver do this by maximising the number of parts on a plate so customers have to buy fewer plates and waste less metal," says Tom Stillwell, product marketing manager for Hypertherm CADCAM software products. "At the same time, the internet of things has allowed us to make great strides in manufacturing automation. Data that we've never had before is now easily at our fingertips. Tools like our Production Manager module will help customers look at their operations more holistically, providing insight to help them work smarter, faster and more profitably."

Hypertherm plasma and OMAX waterjet cutting products are engineered and manufactured for use by companies around the world to build ships, airplanes and railcars, construct steel buildings, fabricate heavy equipment and more. Its products include industrial cutting systems, CNCs and software trusted for performance and reliability that result in increased productivity and profitability for hundreds of thousands of businesses.

Hypertherm Europe B.V.
Tel: 0031 165596907
www.hypertherm.com

Kingsbury quality comes to the surface with ACCRETECH

The surface characteristics of technical products have a critical impact on their performance, lifespan and visual appearance. Further complicating component inspection, many industries surface roughness tolerances parameters are narrowing. Although a wide range of static surface roughness measuring instruments are now readily available, when a company's requirement is for a precise, easy and quick to use portable surface roughness instrument, the options are relatively limited.

After searching for a suitably accurate and efficient portable means of inspecting the surfaces characteristics of ground components, the technical staff of Kingsbury's Grinding Division discovered the advanced HANDYSURF+ instrument. In addition to delivering the high-levels of precision required, the robust ACCRETECH product had the ability to be easily transported to customers' premises and to withstand shop-floor use.

Kingsbury launched the company's Grinding Division in 2017 and now represents Haas Schleifmaschinen GmbH in the UK, Ireland and the GCC region with the aim of providing its customers with first-class grinding machines and comprehensive CNC grinding services. Also, in late 2021, Kingsbury was awarded representation for Studer AG within the GCC region.

A key element in Kingsbury's Grinding Division's success has been its ability to provide its customers with excellent levels of end-to-end support. In addition to employing highly-skilled personnel, to help ensure the best outcomes for its customers Kingsbury's Grinding Division provides its staff with first-class equipment. For example, the recently purchased ACCRETECH HANDYSURF+ is now being used to gather accurate surface roughness data in pre-qualification trials before the sales of grinding machines. The instrument is also used to aid the development of new processes.

Kevin Ling, Kingsbury Grinding Division application engineer explains. "As a company, Kingsbury have more than 60 years of experience in supplying highly efficient and cost-effective machine tools and delivering first-class levels of support. Since its launch, we have applied Kingsbury's time honoured levels of customer care to our Grinding Division.

"When demonstrating the effectiveness of our machine tools and showing the complexity of the components we can develop, establishing required surface finish standards is a priority. This is a necessity not only for customer compliance, but also for determining dressing parameters and the optimum grinding wheel specification for best possible performance.

"The purchase of our advanced ACCRETECH instrument provides us with the ability to quickly measure surface roughness with excellent levels of precision. In addition to other uses, our HANDYSURF+ is employed to prove the exceptional standards of surface finish that our grinding machines are able to achieve and to provide our customer with confidence.

"Also, our ACCRETECH equipment is used to guarantee that our machines continue to deliver expected financial returns to our customers as we assist in the development of new processes and product lines. We work closely onsite with engineering teams across many industries. As the HANDYSURF+ instrument is portable, it allows for quick and easy application in a live production environment."

ACCRETECH offers a comprehensive range of high-quality instruments for the use of measuring surfaces characteristics. The company's products meet a wide variety of requirements regarding resolution, precision, component size and application. Although the HANDYSURF+, as purchased by Kingsbury's Grinding Division, is regarded as ACCRETECH's entry level

surfaces measuring product, the robust, portable instrument boasts a wide range of features that are normally found only in more expensive, static instruments.

Building on the global success of the company's previous HANDYSURF instrument, ACCRETECH's HANDYSURF+ features an ergonomic design, a simple operating system and intuitive software. Also, whereas the original HANDYSURF model required users to set a narrow range when measuring with a high resolution, the new, user-friendly HANDYSURF+ dispenses with this requirement. The advanced new instrument has a generous Z direction measuring range of 370 µm, the widest in its class and achieves a resolution as high as 0.0007 µm over its entire range.

Given the less than perfect environments the robust HANDYSURF+ is able to be used in, the instrument's 2.4 inch colour LCD has significantly improved the visibility of its readings. In addition, the provision of clear, graphic representations of measurement results allows on-site verification with the use of various parameters and waveforms.

Simple 6 button operation and newly developed UI enables intuitive operation and trouble-free access to multiple analysis functions, while waveform types can be easily changed by using a screen located icon. A useful enlargement function and an automatic Go/No-Go judgment function, established by setting upper and lower limits, are easily accessible. Despite its relatively compact size and portable nature, the HANDYSURF+ is capable of a wide variety of analyses modes, including BAC, ADC, peak-count and motif analysis.

A choice of three optional drive unit's allows potential customers

to choose a HANDYSURF+ model according to their individual needs. Standard equipment includes a carrying case, calibration Plate, user's Guide / Quick Reference, amplifier, tracing driver, pickup, cables, calibration table and a CD-ROM. If required, by using the supplied USB cable or optional USB memory, inspection certificates can be created from measurement results. Alternatively, results stored on the HANDYSURF+'s internal memory can be downloaded to a PC as a text file.

ACCRETECH SBS UK
Tel: 024 76 651774
Email: woodt@accretech.eu
www.accretech.eu

The perfect machine shop partner

DEXTERA sets the standard as an operator free, production ready CNC Coordinate Measuring Machine (CMM) for use on the shop floor. It comes fitted with Cobot based auto loading, "Seek & Find" component sensor, random part location and pickup. It requires no fixturing and uses an advanced AI wrist camera. In addition to routine metrology inspection, it can provide feedback and correct your tool wear and offset through closed loop software solution.

Based on the Deltron CMM, it has a compact footprint and can be used standalone or integrated into a manufacturing cell with the pre-configured collaborative robot. The CMM features state-of-the-art Delta configuration, high levels of measurement accuracy and repeatability, temperature correction and powerful yet easy-to-use software for lights out inspection. Solid-Model programming and CAD comparison is a standard option.

Key features include: Stable composite structure; sealed bearings that are ideal for shop floor use; no air supply needed for low running costs; Ultra-Compact footprint to fit

where a standard CMM won't; active temperature compensation for operation outside the QA lab; Easy-to-use, yet powerful measurement software; program directly from CAD, as an option; affordable shop floor universal gauge.

System prices start from £22,000. To arrange a demonstration at Optimax's Midlands showroom call: 01858 436941

Since 2002, Optimax has been selling solutions to applications and it doesn't end with a purchase. The company wants to develop ongoing relationships with all its customers, large and small and hopes to be providing microscopy and metrology solutions well into the future. Aftercare is hugely important to the company, with training to ensure you get the best from your equipment and service and calibration contracts to keep it in great shape and help maintain throughput in your business.

Optimax
Tel: 01858 436940
Email: sales@optimaxonline.com
www.optimaxonline.com

10 consecutive years of growth at FC Laser Ltd

FC Laser has been busy. Very busy, in fact, since day one, with quantifiable revenue and services growth in every financial year since its incorporation. The company, based in Derbyshire, has expanded and moved premises three times in the past ten years, but has found a 'forever' home at its Stanton by Dale site. Last year, it broke ground on its space doubling adjoining site. This expands the company's footprint to exceed 40,000 sq ft.

Material storage within the loading system

The adjoining site, which is now fully operational, houses the companies two BLM LT7 tube lasers, the Bystronic automated loading and storage system, two Bystar 12 kW 3015's and a fabrication and assembly zone. The assembly zone has a dedicated team for building and assembling balconies, a longstanding partner of FC Laser and FC's product and TukTuk conversion divisions.

Loading system and Bystar laser bed

The product divisions of FC Laser creates diversification for the business, allowing the team to showcase the quality of manufacturing services offered. Operating as Black & Stainless Creative Metalworks, the product division has already established itself in the private and commercial garden furniture sector. The team supply commercial custom garden shelters, heaters and seating. In 2022, Black & Stainless expanded into the retail sector, partnering with Costco to provide its products at in-store events across the UK.

TukTuk conversions, FC Laser's newest product offering, takes authentic electric TukTuks and transforms them into mobile catering units. So far, the team has converted TukTuks to serve numerous products in order to satisfy customer demand.

Milestones

2012 - 2015
FC LASER starts operating with one 3 kW Bysprint, adding two more within three years and begins offering press brake services

By 2018
The team have moved to current head office adding Bystronic press brakes and a LT7 tube laser. Installing Bytrans loader to 4 x 2M Bystar

By and during 2022
The adjoining facility opens, FC sets up separate product division and adds a second LT7, automated loading system and 6M Bystar fibre laser

Discussing the anniversary of FC Laser CEO Danny Fantom commented: "In 10 years we have gone from strength to strength, starting with one 3 kW Bysprint Laser, we now run five Bystar machines including a 12 kW Bystar 6225. We have also worked to add new services including part folding, welding, fabrication and assemblies. One of our proudest moments has been to move the company onto an Employee Ownership Trust business model, whereby every employee regardless of job role is equally important and integral in the company's success."

FC Laser's services are 24/7 and include:

Laser Cutting - Five Bystronic fibre machines: three 12 kW machines up to 6,000 x 2,000 mm sheet size and two 10 kW machines up to 4,000 x 2,000 mm sheet size

- ✓ 30 mm stainless and aluminium, 25 mm mild steel
- ✓ Stainless processing without cross contamination
- ✓ Fully automated material handling system

Tube Laser Cutting - Two 3 kW LT7 fibre tube cutters

- ✓ 150 mm Ø stainless and aluminium and mild steel
- ✓ Tube, box section, angle and channel
- ✓ Full automation

Folding -

- ✓ One 320T Xpert 4 m bed
- ✓ One 320T Xpert 2 m bed
- ✓ One Xpert 150 3 m bed
- ✓ Three Xpert 30T 1 m bed
- ✓ Electric press – Xcite 80

Machining & Pemming

MIG & TIG Welding

Assembly

Finishing -

- ✓ Powder coating
- ✓ Polishing
- ✓ Deburr

All services are carefully planned and executed under quality processes of ISOQAR UKAS ISO 9001:2015 and EN1090 execution class 2 standards, and our plant operate to 5S principles.

An open invite from the team at FC Laser

As our business continues to grow, we are always on the look-out for new partners. This Summer we are inviting any company that would like to work with us, the opportunity to visit our facility for a full tour including refreshments from one of our TukTuks. We truly believe you must experience the service and professionalism we offer first hand.
If you are interested in taking a facility tour, please email: enquiries@fclaser.co.uk and we will book you in for 'your tour' with one of our account managers.
If you cannot visit, you can take a virtual tour by scanning the QR Code.

FC Laser Tel: 0115 944 3428 Email: enquiries@fclaser.co.uk www.fclaser.co.uk

Gripple invests in Nukon fibre laser from Ingenium Integration

Gripple is a leading manufacturer of wire joining, tensioning and suspension systems as used in construction, agriculture, solar energy and the utilities sector. The business was established in 1989 in Sheffield and today employs more than 850 people across 15 global locations.

Immensely proud of its Yorkshire roots, Gripple manufactures across five sites in Sheffield. A 100 percent employee-owned company, it has a unique approach to business, characterised by investment in people, innovation and sustainable growth.

Earlier this year, with an ever-increasing order book, a desire to further reduce its carbon footprint through reduced outsourcing and a wish to provide its Ideas and Innovation team with even greater opportunities for new product development, Gripple took delivery of a new Nukon 2D fibre laser machine at its recently opened Norfolk Bridge facility in the heart of Sheffield.

The machine, a Nukon Eco 315 4kW model, was supplied by Ingenium Integration Ltd, the exclusive UK and Ireland distributor for Nukon's 2D fibre laser, 3D fibre laser and fibre laser tube cutting technologies and the sister company of UK-based tube bending machinery specialists Unison Ltd. Built in Europe, Nukon laser machines offer highly accessible power and performance and are equipped with solid state American-made nLIGHT fibre lasers as standard.

Providing the best possible solutions

"Ever since Gripple was formed, our company focus has been on providing customers with the best possible solutions through a process of continuous improvement," says Claire Tunnard, production manager at Gripple's Norfolk Bridge site. "Here at Norfolk Bridge, for example, our work typically surrounds the manufacture of the Gripple Fast Trak® bracket system for mechanical and electrical service suspension, as well as solutions for the OLE rail industry and utility solar applications." For this type of work Gripple typically uses CNC-controlled punch machines, with tooling specific to individual production requirements.

However, with an Ideas and Innovation team continually looking to provide novel new solutions to the challenges faced by customers as well as develop products for new markets, coupled with a company-wide drive to bring even more production in house, the decision was made to bring the versatility offered by laser cutting into the manufacturing process by investing in a new 2D, flat sheet metal laser cutting machine.

Developing a good connection

After considering a number of laser machine manufacturers, Gripple shortlisted Nukon and another leading brand. With the high levels of product quality and capability provided by Nukon machines never in doubt, what ultimately sealed the deal was the effort that Ingenium Integration and its sales manager Steve Haddrell put into fully understanding how Gripple would use its new fibre laser machine, both now and in the future. Claire Tunnard continues: "A member of our team did quite a bit of research into laser machines as this was a new technology for us. In the end, it came down to relationships and, having met Steve and his colleagues, we felt we could develop a good connection with them and would be able to call on them for help and advice. It was also reassuring to know that should we ever require on-site support, the Ingenium team is UK-based and only a couple of hours' drive away."

Sharing a wealth of knowledge

Installed at the end of March, Gripple's new Nukon Eco 315 4 kW fibre laser is already making a difference to the way the company produces several of its components, as well as assisting with new product development. "Installation and commissioning of the machine took little more than a day, after which full training was provided," adds Claire Tunnard. "Perhaps most importantly, our hunch that Ingenium Integration would provide high levels of customer service was well-founded. In fact, nothing is too much trouble for them. As you can imagine, we are still discovering the full capabilities of our new Nukon fibre laser, so we are asking lots of questions. The machine's build quality and performance are impressive. Ingenium Integration have shared a wealth of technical knowledge with us, have advised on specific production processes and are currently assisting us in establishing

the most cost-effective gases to use, depending on the material being cut, the speed of cut and the finish required. That alone is a real benefit and will result in measurable savings."

A good fit for Ingenium

Alan Pickering, joint managing director of both Unison Ltd and Ingenium Integration Ltd, says: "Before being appointed as Nukon's exclusive UK and Ireland distributor in 2021, we spent time searching the market for a range of high quality, accessible laser cutting technologies that would be of significant interest to manufacturers. Everything about Nukon and their machines, from the quality of construction, to the exceptional cutting speed and uncompromising levels of support, met our high standards and it just felt like a really good fit for Ingenium. The interest in the Nukon range at the recent MACH show was phenomenal."

Steve Haddrell, sales manager at Ingenium Integration adds: "For us, it is all about supporting the customer. We have worked very closely with Gripple throughout the process and will continue to do so. Our service and support teams in Scarborough and the Midlands are never more than a phone call away and we also have the support of Nukon in Turkey; they are very approachable and helpful."

The Nukon 2D Eco 315 4 kW fibre laser machine purchased by Gripple was specially developed for organisations wishing to add value to in-house manufactured products and for subcontractors either starting out in 2D laser cutting or with demanding flat-bed laser metal cutting requirements. Eco machines offer high-spec features that are standard across the Nukon range. These include advanced Lantek Expert CADCAM nesting software and American-made nLIGHT fibre lasers. The Nukon fibre laser range

includes: 2D, 3D (5-axis) and laser tube cutting machines, all of which combine high performance with high efficiency.

Companies buying a Nukon fibre laser cutting system from Ingenium Integration can also expect to receive uncompromising levels of service and support.

For more product information, contact sales manager Steve Haddrell on 07921 408276:

Ingenium Integration Ltd
Tel: 01723 582 868
Email: sales@ingeniumintegration.com
www.gripple.com
www.ingeniumintegration.com

TRUMPF cuts XXL sheets with less waste

The new TRUMPF TruLaser 3080 fibre laser cutting machine fabricates parts in sheets up to eight metres long and is particularly adept at cutting large and heavy parts weighing up to 7,850 kg, such as facade components and trailers for trucks or cranes.

The TruLaser 3080 fiber can also be used for small and medium-sized parts, so operators can easily use it to its full capacity and make optimal use of their production capacity. "There are only a few companies in the sheet-metal fabrication market that can cut oversized parts precisely to size. We pride ourselves on being a solution provider and this machine really does give our customers a competitive edge and the ability to process even more jobs in less time," says TRUMPF product manager Patrick Schüle. The machine can handle sheet thicknesses up to 50 mm and processes a variety of materials ranging from aluminum to mild steel.

Multi-shift operation without automation

The TruLaser 3080 can be used in multi-shift operation without requiring complex automation. It comes with an automatic pallet changer that automatically inserts a second sheet as soon as the laser has completed its first cutting pass. This results in an overall machining area of 40 m^2 of sheet metal and allows the machine to cut parts for several hours without the operator having to add any additional raw material.

Less material, more productivity

Due to the size of the panel, different component shapes can be nested in the cutting program in a material-saving manner. This allows users to use almost the entire raw material. The machine is also equipped with a universal cutting unit with a fully adaptive lens system. The focus diameter of the laser beam can be selected as desired. With this flexibility, the TruLaser 3080 fiber effortlessly manufactures a wide variety of applications. In addition, it achieves very high productivity and quality in all sheet metal ceilings.

Maximum flexibility

The machine can process a wide range of materials including mild steel, stainless steel, copper and brass and it can even create high-quality parts from thin metal sheets. From the smallest part to the largest, the TruLaser 3080 comfortably tackles every job and gives fabricators the flexibility they need to broaden their offerings and cater to a wide range of applications. In addition to an oversized sheet, companies can also place several smaller sheets on the pallet in the machine. This gives them even more flexibility in production.

Nano joints: reliable tabbing without wasting material

The TruLaser 3080 also features TRUMPF's new "nano joints" technology, which boosts process reliability on the shop floor by eliminating the need for through-thickness tabs, or "micro joints", in sheet-metal fabrication. Micro joints are commonly used to ensure that cut parts do not bank out while the rest of the sheet is being cut. They remain in place until they are broken by a production worker after the parts have been removed from the machine. Subsequently, the breakage points on the cut edge need to be smoothed, which leads to additional finishing work. Micro joints also increase the time it takes to remove parts from the nest, because it is not always possible to break the joints smoothly. As well as adding time to the overall process, micro joints also waste material because operators cannot place parts directly next to each other in the nest.

Unlike micro joints, TRUMPF nano joints only create tiny retaining tabs. This enables users to arrange parts directly adjacent to each other in the sheet, thereby saving material. In addition, the processing time is shortened because the laser creates the retaining tabs while cutting the contour of the component. Almost no post-processing work is required because the contour injury is barely visible. Production workers do not have to apply as much force to separate parts from the metal sheet, so they can remove parts from the nest quicker.

TRUMPF Ltd
Tel: 01582 725335
Email: sales@uk.trumpf.com
www.trumpf.com

New managing director appointed at AMADA UK

On the 1st of April AMADA Company Ltd, Japan, appointed Paul Mansfield to the position of managing director and COO of AMADA UK Ltd.

Paul Mansfield is the new managing director of AMADA UK

With almost 25 years of service at AMADA, Paul Mansfield is well known to staff and customers throughout Europe and brings extensive knowledge and management experience to the role. The new position will run concurrently with his existing role as COO of AMADA Maquinaria Ibérica in Spain. He succeeds Steve Basford who remains with the company as a special advisor, focused on customer relations.

Speaking at the start of AMADA UK's 50th Anniversary year celebrations, he recognised the responsibility of the role and explained his vision for the future of the company: "It is an honour to be chosen for this position and I appreciate the opportunity to continue the hard work begun by my predecessors as we look forward to the next 50 years. It is an exciting time in the manufacturing industry as we start to realise the potential of IoT connectivity and the opportunities it gives for flexible, efficient production in a changing world. Our reputation for excellent customer service and outstanding machine quality will continue with renewed focus as we introduce IoT technologies to give our customers a competitive edge".

Alan Parrott, AMADA's European Regional CEO, is also positive about the future: "Paul is the right person to take the company forward. His wide experience and customer focus will ensure stability for both customers and staff alike. Paul's vision for the company will also ensure AMADA UK builds for the future while maintaining its position as an industry leader for customer service and support."

AMADA UK continued its 50th Anniversary celebrations with a two-week exhibition.

AMADA
Tel: 01562 749500
Email: info@amada.co.uk
www.amada.eu/uk-en

Looking to the future

Introducing the new managing director of Bystronic UK, Paul Cooper

Can you tell us about your career history and your journey to Bystronic UK?
Prior to joining Bystronic, I worked in the machinery and capital equipment sectors, both in the UK and overseas. I lived in America and was responsible for subsidiaries in Brazil, Mexico, and Canada. After USA, I moved to Asia, living in Singapore, where I was responsible for several subsidiaries around Asia. Throughout, I have gained experience working for high quality machinery manufacturers in a global setting, often with manufacturers based in Germany.

I am now most excited to bring my experience to Bystronic and be based in the UK again with responsibilities for my home market.

What are your first impressions and immediate priorities at Bystronic UK?
The prime focus for me over the next few months is to get to know and understand this industry. At Bystronic in the UK, we've got a great management team. I've inherited a well-performing organization and that makes life much easier. I'm starting to understand what's going on, but really there is no firefighting for me to deal with. Clearly, the team has been very successful over the past few years and, globally, Bystronic is extremely well-led.

I am impressed with Bystronic's culture which is centred on the customer and I personally want to visit as many customers as possible. That, for me, is as important as understanding the machinery. Although we are a large, multinational company, we are still able to really understand the small manufacturer and work very closely with them. We are not exclusively aimed at large organisations and high-volume manufacturing. That's not the case. Somebody who has one laser, for example, is very dependent on that one laser. That laser needs to be reliable, to be maintained well and function all the time, but it also needs flexibility. It needs to be able to cope with the different work that that company wins and that business must look after their own customers.

Bystronic has a culture that really cares about its customers and about its own people too. Both of those things are very, very important to us.

What are your plans for the near and mid-term future?
The plan is to continue growing, but in a sustainable way to make sure we continue to give excellent customer service. We've grown quickly over the last few years and we see that continuing. The products are fantastic, so we're in really good shape. Bystronic is widening the product offering a little bit, which helps. We are growing our after-sales offering too, in terms of the breadth of what we can offer to customers and the support that we can deliver and also in the quality of how we can support them. To support this growth, we are recruiting and strengthening the team. We are also upskilling our existing engineering team, so rather than having individual laser and press

brake engineers, we are multi-training them to be more flexible.

What are the biggest challenges you face in the coming year?
Like other industries and companies, the current situation in the supply chain is challenging. So far, Bystronic has done a very good job in managing suppliers and delivering machines to our customers. Capital equipment sales are linked very strongly to confidence and market sentiment. People will invest when they're confident. When they're a bit cautious or nervous, they'll put off the investment and make do with the existing equipment. We are seeing an increased uptake again, following COVID and we hope we will continue like that for the rest of the year.

How is Bystronic facing the climate change issue and net zero emissions targets?
It's an important part of the focus in the design of new machines to make them as energy efficient as possible. Sustainability is key for our company and is part of our strategy. While our R&D team is focusing on sustainable engineering to increase energy efficiency, our service and software teams are contributing to advancing a circular business model in our industry. Bystronic has also a pre-owned business, where we refurbish used machines and bring them back to the market. There is a strong commitment from Bystronic to do business in a responsible way, not only regarding the environment, but the company ethos is also built around looking after our people.

When it comes to after-sales support, we try to minimise the need for engineers to travel to site by keeping machines running in their factories. The first part of this is our ByCare support, which is a very strong preventative maintenance program, working very closely with our customers, looking after the machines, making sure that everything's in place so that every machine will minimise its downtime before you even reach a breakdown. So that's a very good way of reducing the need for breakdown support. We have a very big team and we can sort out a lot of problems remotely, dialing in to customers' machines and analysing them. We can fix a very high percentage of problems and keep people running very efficiently in that way.

What new and exciting products are in the pipeline?
This year we are launching many new products, including new laser machines with higher average power and some more automated press brakes and solutions for loading and unloading which will make our customers able to achieve increased productivity. Also, in our showroom, we are showcasing the new ByTube Star which is something novel and interesting for many of our customers.

We will also be running an Open House in the autumn, and typically there is a lot of demand for these. We expect 40 to 50 people per day over two or three days. During the pandemic, we have been running socially distanced visits but now there is a real demand to get out and about and see and touch the latest machinery. However, our Experience Centre is always open to demonstrate our latest technology.

Bystronic UK Ltd
Tel: 0844 848 5850
Email: sales.uk@bystronic.com
www.bystronic.co.uk

Nitr02 Gas Mixer Unit

Nitrogen is designed for high pressure gas mixing for higher power fibre lasers, 8 kW +. There are two key reasons for using gas mixers. Firstly, when you cut mild steel with Mix gas, compared with high pressure pure nitrogen, you get a much better-quality cut edge on the side of the parts and the dross on the underside is vastly reduced, especially on the thicker materials. MSS were seeing laser users companies reverting back to oxygen cutting because they had to debur the parts that were nitrogen cut and they didn't want the cost and complexity of the second operation. That meant they have to settle for the much slower Oxygen cutting speeds, i.e. up to three times slower, to get the quality and only single operation. Now add the mixer and you get the much faster cutting speeds and still run the process on a single operation.

The second key benefit is the reduced nitrogen usage and slightly faster cutting speeds, up to 20 percent. You can see this quite clearly on the table. It is quite clear especially on the ¼" material. It cuts 10 percent faster and uses much smaller nozzles at considerably lower cutting pressures hence reducing nitrogen consumption by up to 60 percent.

	Cutting Speed (ipm)		Nozzle Diameter (mm)		Gas Pressure (MPa)	
Material	Old (No Mix)	New (Mix)	Old (No Mix)	New (Mix)	Old (No Mix)	New (Mix)
14 ga.	1300	1350	2	2	1.4	1
13 ga.	1150	1250	2	2	1.4	1
10 ga.	555	600	4	4	1.8	1
7 ga.	325	335	7	4	1.6	1.2
1/4"	205	225	7	4	1.6	1

MSS Nitr02 features
- Automatic CNC purity control
- Enhanced quality edge without burr
- Real time purity mix change
- The most compact gas mixer in the market
- Compatible with any laser machine
- No mixing vessel required
- Operates on pressures up to 34 bar
- Positional feedback control for O2 setting
- Electrical supply 110V/220V

Air cutting
- No compressor nor booster required
- Low maintenance costs
- Faster cutting speeds for aluminum
- High Pressure cutting
- Flowrates 100 m^3/h & 150 m^3/h

MSS was formed in 2003 with the aim of offering a complete service to the laser cutting industry, with the company's excellent reputation for servicing all makes of laser cutting machine providing the springboard for its growth.

MSS Lasers has become a leading specialist in the sale of fully reconditioned laser systems and a UK market leader in the supply of high-pressure nitrogen generation equipment to the laser industry.

MSS Lasers
Tel: 01788 552299
Email: sales@msslasers.com
www.msslasers.com

A laser focus on manufacturing

Once heralded as the technology of tomorrow, lasers now play a key role within many manufacturing facilities today. Thanks to the laser, many manufacturing processes which would otherwise have been impossible, inefficient, or too costly to implement are now part of everyday production techniques across many industry sectors. The ongoing development of lasers, combined with their inherent flexibility, means that lasers continue to not only improve production processes, but open up new opportunities for the application of this technology.

Leveraging the full potential of laser technology is Bromsgrove-based TLM Laser. Founded in 2006, initially as a dedicated laser service company, TLM Laser today is recognised as one of the UK's leading laser technology suppliers with an impressive portfolio of laser sources, modules, systems, and support technologies. With distribution partnerships with a number of the world's leading laser technology manufacturers, TLM provides solutions for laser marking, engraving, metal welding, plastic welding, cutting, cleaning, material processing and 3D metal printing.

Choosing the right solution

The ready availability of lasers today, combined with the choices of laser source: CO_2, YAG, fibre etc. and different wavelengths, means it is important that potential users seek qualified advice on the most appropriate solution for their application. TLM's Andy Toms explains: "It's never been easier to access laser technology, with opportunities to purchase from a plethora of suppliers and sources. However, just as for other technologies, it is essential that all aspects of the application be reviewed in detail to ensure that the most appropriate laser system is selected. For example, depending upon the intended use of the laser it may be that a CO_2 or a fibre laser will be best suited. In addition, it is advisable to consider potential future needs to ensure that the investment will provide an ongoing return in the longer term."

Technologies for all applications

Lasers have become essential production tools for many manufacturers: cutting, welding, marking, cleaning, and processing many material types. Equally, different sectors have their own specific and diverse requirements, such as high-quality indelible marks used for Unique Device Identification (UDI) on medical devices, or laser scoring and converting on the packaging materials and films used within the food sector.

One example of the technology available from TLM Laser for high compliance marking on medical devices is FOBA Laser's M2000 laser marking system with MOSAIC.

This fixtureless marking concept uses through-the-lens vision, combined with a process of "tiling" the images of the part. The camera is used to capture multiple small images and then arranges them into a single large image, just like a mosaic.

This image is then used for system training, job setup, part validation, pre-mark verification and mark alignment. The natural straight-down view from inside the laser provides an imaging field as large as that of the laser marking area. The benefit of this configuration is that it eliminates the need for external cameras, which can sometimes cause inaccuracies due to perspective and optical distortion.

Lasers are available in a number of different configurations for welding applications, whether on plastics or metals. For metal welding, TLM offer a comprehensive range of both stand-alone and mobile welding systems. ALPHA Laser's ALM250 is just one example from the range which is ideally suited to a variety of applications. The mobile configuration of this system makes it ideally suited to mould tool repair tasks, where the laser can be brought to the workpiece, and in many cases, it's not necessary to remove the mould from the machine.

The laser can be made ready for use in just

minutes, with the laser arm quickly positioned and fixed in the desired working position via electro-hydraulic brakes. Welding can be performed manually with the joystick, semi-automatically, or via an external operating unit with a pulse function.

Flatbed laser marking and cutting

Flatbed laser technology is used within multiple sectors for cutting and marking applications. These systems range from desktop units through to large self-contained systems for processing sheet-metals and tubes. TLM has a comprehensive portfolio of systems which cover the full spectrum of applications. Universal Laser's extensive range offers a number of different platforms, available with a choice of CO_2 or fibre lasers and a comprehensive array of options, including MultiWave Hybrid Technology, which allow users to configure the system to their specific requirements.

For sheetmetal and tube processing, the systems from BODOR provide options on fibre laser sources from IPG or Maxphotonics, and laser power up to 40 kW. These systems are ideally suited for

applications on a wide range of metals including: carbon steels, stainless steels, alloys, aluminium, copper, and brass. Working envelopes range from 600 mm x 600 mm up to 6 m x 2 m for the flat-bed systems, and up to 6.5 m in length for tube processing, with the capability of cutting carbon steel up to 100 mm thick, depending upon model and laser power.

Technology backed by expertise

With over sixteen years of experience in applying laser technology, TLM Laser has grown to become a solutions company, recognised for its expertise in specifying, integrating, installing, and supporting laser systems. TLM also supplies a wide range of laser safety equipment, spare parts, fume extraction, chillers, training, consultancy, and subcontract laser marking.

The company's engineers are highly trained and have experienced on a complete range of lasers. Whether they are lamp pumped lasers, diode pumped or CO_2, TLM also offers laser servicing and repair, carrying out scheduled maintenance visits as well as providing call out cover.

TLM Laser
Tel: 01527 959 099
Email: sales@tlm-laser.com
www.tlm-laser.com

Stepping up tube cutting capabilities

Yamazaki Mazak takes its laser-cutting capabilities to the max with the launch of the new FG-220 compact 3D fibre machine

The FG-220 is designed for precision 3D cutting of long tubes, with round, square, rectangular and triangular cross-sections and structural materials, such as I and H beams, angle iron and additional user-defined shapes.

Its use improves the productivity of cutting thin to medium thickness pipe and other structural materials. This is due to the fibre laser technology having a shorter wavelength than a CO_2 laser for high-speed cutting of medium steel with nitrogen assist gas. Higher productivity translates into significant energy savings thanks to the 100 percent elimination of laser gas and a 50 percent reduction in electrical consumption.

Furthermore, the FG-220 is an all-in-one machine that can perform multiple processes including cutting, drilling, tapping and clamping which leads to significantly reduced in-process times.

Mazak has engineered a proprietary 3D laser cutting head with an extended range of movement across an A- and a B-axis, which expands on the array of possible applications. The FG-220 enables machining at any desired angle and from various directions, thus achieving even complex shapes, as well as tight joint-fits. As a result, rigid space frames can be quickly constructed with reduced welding when compared to conventional construction processes. The machine is suitable for use on a broader spectrum of workpieces, including highly-reflective materials such as copper and brass.

The machine is equipped with several features to enable high-precision cutting of long materials, such as auto-centering and clamping of the workpiece and various support units to prevent sagging during cut. Four chucks simultaneously travel on and rotate around the axis to avoid material swaying. The machine can also be provided with work length measurement and inclination compensation to detect bends or twists, a tapping unit for shorter production lead time and a chain type conveyor for continuous operation.

The FG-220 comes installed with the unique Mazak FX CNC and FX TUBE CADCAM software for pipe cutting, which offers plenty of quality-of-life functions such as part nesting, a simulation tool and a tool path monitor to speed up setup times and enable a continuous production.

Yamazaki Mazak UK Ltd
Tel: 01905 755755
Email: sales@mazak.co.uk
www.mazakeu.co.uk

Versatile punch is an ideal fit for Booth Dispensers

The next time you visit a pub, there's a fair chance that LVD machines have played a role in keeping your lager cold or your cola fizzy.

Blackpool-based Booth Dispensers specialises in designing and manufacturing chilling and dispensing equipment for the hospitality trade. At the heart of its sheet metal fabricating facilities are an LVD Strippit PX 1225 punch press and two LVD PPED press brakes.

Tom Boardman, who played a key role in specifying the LVD equipment, explains that the configuration of the PX machine, with a single punch head system allowing 360-degree rotation of any tool and extensive forming capabilities, is an ideal fit for Booth Dispensers manufacturing requirements: "We have our own design and development team, so a lot of what we make is tailored to the customer's requirements. There are some standard products, but a lot of what we do is bespoke.

"So generally, we are making parts to order rather than for stock. We are working about a week ahead of what is required on the shop floor. That means we have to be quite flexible in our manufacturing capabilities as we aren't making the same things over and over again."

Components range from cabinets and enclosures to small brackets in batches of up to 100 off. The largest parts would be just under two meters long and the material would generally be 1 mm thick.

"We aren't making massive batches but it adds up to around 10,000 to 15,000 parts per week, so again it means we have to be flexible," says Tom Boardman.

The PX 1225 machine has 20 stations in its tooling carousel and Booth Dispensers uses four of these for multitools, which takes the total number of tools available to around 32. Most of the round punches are held in multitools.

Tom Boardman continues: "You can index any tool so if you have a shape or slitting tool you can produce some fairly intricate shapes."

The single head punching system also allows a wide range of forming operations to be carried out during the punching cycle and at Booth Dispensers this includes thread forming, dimples and joggles which would not be possible on a laser.

Tom Boardman explains: "We would always like to have a standard tool setup, but because our design department are constantly developing bespoke solutions for customers there are quite a few changes.

"Having a tool carousel rather than a turret machine means changing the tools is quicker and easier. If the tools are already setup in the holders, it's just a matter of swapping them over. This is a very quick process.

He adds that the Integrated TOUCH-P control is intuitive and simple to use, which again speeds setup and production. Booth Dispensers has been using this type of machine since 1999 when it purchased a Pullmax, now LVD, P5000 punch press which is still running.

Complementing the punching machines are two LVD press brakes: an 50/20 PPED, 50 tonne bending force, 2 m capacity, installed in 2019 and a 135/30 PPED7, 135 tonne bending force, 3 m capacity, 7-axis, press brake installed in 2021.

Tom Boardman says that he saw LVD's press brakes when he visited its Banbury premises to discuss the purchase of the PX machine.

"We saw the press brakes and were

impressed. It was a good purchase. Two years later we wanted to add another LVD machine and the 3 m machine was an ex-demo model that was available immediately. We had it delivered within a month of enquiring about it. We needed more capacity and we needed it quickly and having seen the benefits that the first machine had given us the decision was a no-brainer. We probably don't use it to its full extent at the moment but the 3 m capacity is always there if we need it in the future.

"The machines are quick to setup, easy to changeover and they are twice as fast as the machines we had been using. They are user friendly too. All the programming is done on the machine and the Touch-B control is intuitive and easy-to-use. You can see all the steps on the screen and it takes you through a simulation of the bending process so that you can see it works properly."

Looking ahead, Tom Boardman says that the company is now looking at LVD's CADMAN-B software to bring the programming online and integrate the flow from design to finished part. It is also looking at the possibility of adding an LVD laser.

He concludes: "The partnership between Booth Dispensers and LVD has been going over 20 years and we have always had a good relationship with them. The machines are very reliable, but it is good to know that the support and backup is there when you need it. Our team has just been over to LVD's headquarters in Belgium to look at CADMAN software and a laser, so we are continuing the partnership and investing for the future."

LVD UK Ltd
Tel: 01295 676800
Email: salesteam@lvduk.com
www.lvdgroup.com

Automotive future at Magna Presstec

If we take a look at production processes in the premium automotive segment, we often find that OEMs and Tier 1 companies work hand-in-hand with their sub-suppliers during the design and development of the line. The Magna concern relies on high-tech welding technology from Fronius for quality assurance and optimisation of its production processes. Magna Presstec assembles the frame of the Mercedes G to perfection using the Fronius WeldCube Premium software package.

Automotive supplier Magna has built up the perfect production infrastructure around the town of Graz in Austria. Magna Presstec GmbH in Lebring, half an hour's drive to the south-east of Graz, produces the basis of the G model. Magna Steyr Fahrzeugtechnik AG & Co KG in Graz then completes the premium off-roader.

Essence of the automotive high flier

"Globally, the Magna concern has around 158,000 employees. Magna Presstec is part of the COSMA, body and chassis, group of companies", explains Kurt Hartmann, manager of the quality assurance and welding supervision division for frame production of the Mercedes G range. Presstec itself has a workforce of approximately 1,200, divided between its sites at Weiz and Lebring in Austria and Bratislava in Slovakia.

The automotive sub-supplier produces high-quality chassis and structural components made from aluminium and steel. "Our customers include VW, Audi, BMW, Daimler and Porsche. We are pressing ahead to shape the future of the automotive sector with passion and personal responsibility," adds Kurt Hartmann.

High-tech off-roaders demand highest levels of weld quality

The Mercedes G is one of the most capable all-terrain vehicles in the world yet, at the same time, one of the most practical for everyday use. Its huge ground clearance and built-in deep wading capabilities drop a clear hint. The vehicle is designed to cope with the most extreme off-road conditions. Pulling force and a long service life have to be guaranteed when the G is subjected to violent impacts at high speeds on rough terrain, such as during endurance testing over the steep slopes at Schöckl, near Graz. The vehicles are extensively tested on a spectacular mountain circuit, which shows why the construction of the frame for the G class demands so much care and attention. It's no surprise that the quality of the welds also has to be of the highest standard. Mercedes G requirements on welding technology.

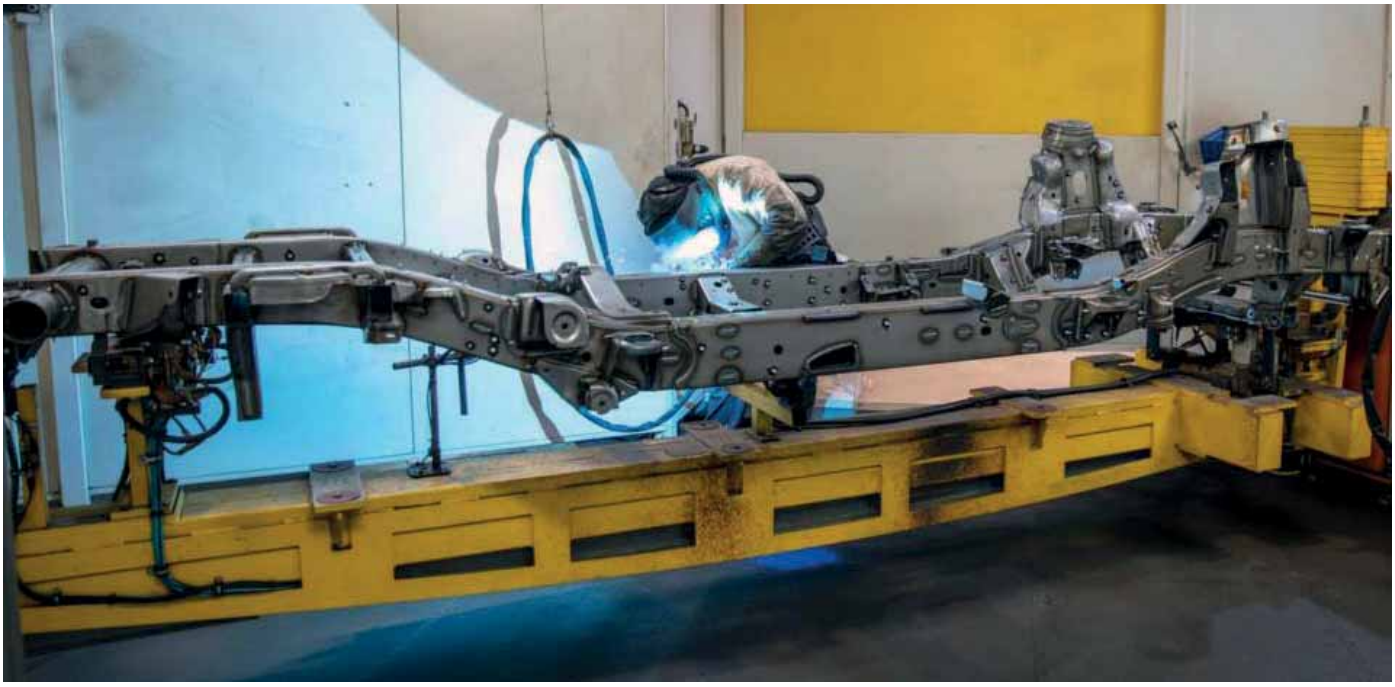
"The steel we use is primarily in sheets 2-4 mm thick, which are joined together using 657 welds. The total weld length per frame is 76 m. The biggest welding challenge for us is to build up the 4.2 m long chassis frame layer by layer, while always remaining within the customer's specified tolerances and maintaining the required top level of quality," emphasises Kurt Hartmann.

This placed varying requirements on the joining technology when tooling up the production line. To generate the urgently required stability in the solid frame, high arc stability with perfect penetration was essential. The stringent quality requirements also called for as little distortion as possible and controllable heat input. For productivity reasons, high weld speeds were also needed.

"The Pulse Multi Control (PMC) process from Fronius was able to totally satisfy our requirements,"notes Kurt Hartmann, who himself has plenty of international welding experience. "This meant we had to have the modular TPS 500i welding platform. Intuitive operation and the straightforward interface to the robot gave us precisely the package we needed. We've currently got 36 of these welding systems on the Mercedes G line and also have some TPS 320i systems for any manual welding we need to do for quality control purposes."

Autonomous quality production in detail

"We like to boast that every frame is identical to the next. It's all about eliminating any deviations", adds Kurt



Hartmann. The production line extends over more than 100 m in a well-equipped hall. Autonomous to a large extent, it satisfies the highest standards. The perfectly coordinated robot systems work seamlessly together, enabling a rugged and perfectly assembled G frame made up of many individual parts to leave the hall every 10 minutes.

The production process takes places in three sections with the front and rear of the frame being produced at the same time. A team of workers starts by tooling up the welding units. Then, in the cells, the components are joined using welding robots. A handling robot picks up the completed components, transports them to the next cell and places them in position. At the end of each section is a cell to which the workers have no access. This is sometimes used for welding long welds, but also for cooling or as a complex station for squeezing, for example, which involves nesting the lower shells with the upper shells of the side members, moving them into position and welding them under pressure.

In the substructure, the final production section, the front end and rear end are brought together and the frame takes on its striking form. The final work steps consist of punching decoupled connecting points for the chassis. In addition, a drawn arc welding operation fires 192 studs into the frame. The quality of the welds is then checked, any welding spatter removed and the welds reworked as necessary. Finally, robot-controlled laser systems take precise measurements of the frame and check that it meets all the required quality criteria.

Ultra-professional welding data management

This extremely complicated procedure demonstrates that it's not just about welding at Magna Presstec. To be able to ensure the high degree of automation and high quality for the G line, the focus right from the outset was on the integration of monitoring and data analysis tools for welding processes. The automotive sub-supplier was looking to cooperate with joining specialists whose systems and solutions facilitated the total digital traceability of the welding processes. With its WeldCube Premium software package, Fronius was for the first time able to install a comprehensive welding data management system in the production facilities of a Tier 1 supplier and to demonstrate the benefits of the various software systems being used.

From quality assurance to predictive maintenance

"We've found the perfect partner in Fronius," enthuses Kurt Hartmann. "WeldCube Premium is an important pillar of our quality management system, as the complete traceability of every single weld is incredibly important to us." Trained operators at the quality control stations are presented with the most accurate information on their terminals: Are there any dubious or actual faulty welds? Locations picked out by Fronius WeldCube are subjected to a detailed visual inspection and reworked if necessary. Only then is the G frame released for the next stage in the process. The gathered data is then fed back to help optimise the automated welding processes.

WeldCube Premium charts every mm of the weld, making it a simple matter to analyse the cost of consumables such as gas and welding wire. Yet it has much more potential, for example Predictive Maintenance which provides the ability to order wearing parts and other materials in good time and in sufficient quantities.

"Predictive Maintenance with WeldCube Premium was able to uncover areas of potential savings, for example by having the welding management system specify precise maintenance intervals", observes Kurt Hartmann. "We're always kept fully informed about the condition of contact tips, torch bodies, welding torches and wirefeeders, which means we know exactly when to service the equipment to avoid faulty welds, rework or the scrapping of components."

Magna Presstec was already a user of the Fronius Central User Management (CENTRUM) system, which it uses in quality management. CENTRUM is where user and welding permissions are centrally managed. Welders use a smart card to identify themselves to the welding system, ensuring that only specially trained operators are allowed to work with the relevant parameters. It is another way of eliminating potential sources of error.

Fronius UK
Tel: 01908 512300
Email: info-uk@fronius.com
www.fronius.co.uk

Compact welding cell at ENKO

For Denkingen-based KAUTH GmbH und Co. KG, a company that specialises in high-quality metal processing, ENKO Staudinger has developed a compact universal welding cell, combining a range of different welding processes in a single cell with minimised space requirements. "The requirement of the customer Kauth was the construction of a welding cell that was suitable for both spot welding and arc welding, taking all accessibility requirements into consideration," explains Bernd Menhart from ENKO Staudinger. The Augsburg-based manufacturer built the cell around two KUKA robots that perform the welding tasks.

Rotating table allows loading with no effect on the cycle time

The universal cell is centred on an H table with a KUKA robot of type KR 6-2 mounted in the middle. Use of a rotating table means that there is always one welding fixture in the productive process, while the second fixture is being loaded by the operator with no effect on the cycle time.

First of all, an operator loads the workpieces into the welding fixture and starts the system. The table rotates the clamped fixture through 180° beneath the robot into its welding area. The KUKA KR 6-2, equipped with a Fronius CMT torch for arc welding, moves into the fixture and welds the workpieces. A second robot, of type KR 210 R2700 extra, equipped with an X 100 servo-pneumatic robotic gun from Düring Schweißtechnik, then moves into the fixture again and joins the workpieces by means of spot welding.

On completion of the welding process, the H table rotates and a second, newly loaded fixture enters the workspace of the robot. The rotation of the table moves the first fixture back into the workspace of the operator. The clamps open pneumatically and the operator can remove the welded parts. The loading/unloading by the operator has no effect on the cycle time.

Two robots combine mobility with precision and speed

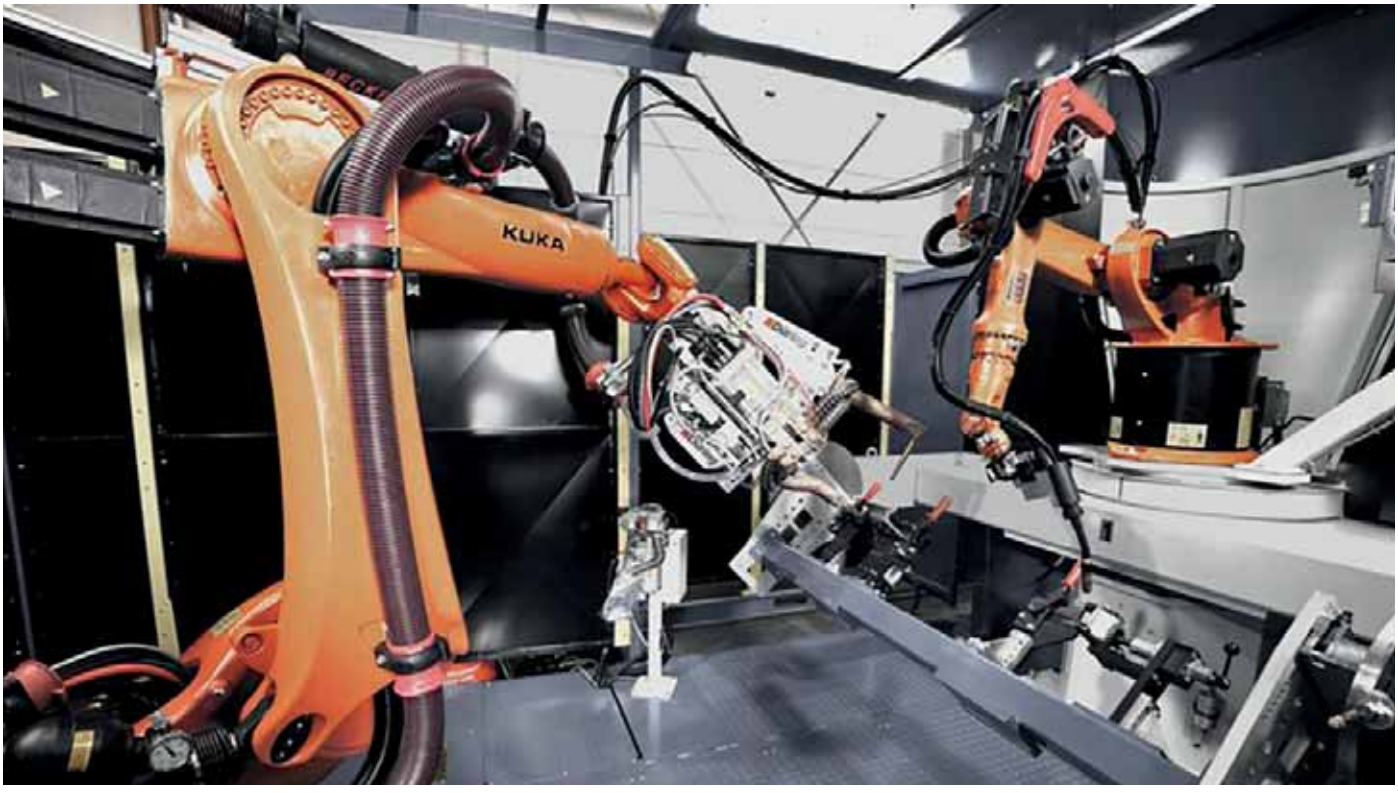
With its low payload capacity of six kilos and a reach of 1,600 mm, the KUKA robot of type KR 6-2 mounted on the table is ideally suited to standard arc welding tasks. The streamlined design of the wrist ensures that the robot enjoys minimal disruptive contours and maximum freedom of motion. The welding expert is thus able to reach all welding positions on the workpiece effortlessly.

The KR 210 R2700 extra performs spot welding tasks with high precision and at high speed. As is the case for all robots in the KR QUANTEC series, it is characterised by reduced space requirements and a wide variety of potential applications. With a payload capacity of 210 kg and a reach of 2,926 mm, it is predestined for the spot welding process in the universal cell.

Highly flexible solution for frequently changing tasks

The cell provides the customer with a wide range of options for the universal implementation of various welding processes, or even combination with other robotic tasks. This flexibility makes the solution of particular interest for small series and prototype production, as the cell can be adapted very quickly and easily to new workpieces.

With more than 40 years of experience and know-how, around 70 employees manufacture both conventional, manual fixtures and individual, complex systems for customers in the automotive industry, aerospace industry, chemical industry and general industry.



The KR 6-2 (on the right) performs the arc welding while the KR 210 guides the servo-pneumatic robotic gun

KR 30-L16 welds agricultural implements at Horsch

KUKA welding robots cuts production times in half

Since 1988, SMT Systemtechnik GmbH, based in the town of Syke in Lower Saxony, Germany has been developing systems for flexible robot applications and special machines as well as systems for steel and machinery manufacture. From its inception, the company and its 16 employees have focused on serving the growing market for robot applications in various process areas such as welding, cutting, palletising or even handling.

Fully automated welding process

It was with the goal of achieving higher output and higher quality in the welding process that Horsch Maschinen GmbH, a company based in Schwandorf, Germany, turned to SMT Systemtechnik. Horsch was searching for a solution for the welding of its agricultural implements in which the clamping and accessibility of the product components allowed for full automation of the welding process. The goal was to enable higher output and improved process quality.

Two workstations with KUKA robots

The robot welding system consists of two workstations with two robot systems, which are installed on a C-support gantry in an inverted position. Both systems can be moved on a floor guidance mechanism and are equipped with two rotateswivel-lift positioners. The clamping diameter, the clamping height and the length are all five metres. Beyond this, workpieces weighing up to 4,500 kg can be handled. TCP (Tool Centre Point) calibration is performed automatically in order to ensure consistently high application quality.

Large work envelope increases production possibilities

Two KUKA KR 30-L16 robots are used which are particularly suited for medium payloads. With a reach of up to 3,102 mm and a positioning accuracy of 0.07 mm, they are ideal for carrying out precise welding work. Thanks to the long-jointed arm as well as the long link arm, these robots have a large work envelope to open up a whole new range of production possibilities.

Production times cut in half

The implementation of this robot-automated solution brings a significant productivity advance. Cycle time reductions are achieved during welding as well as during handling, thus enabling manufacturing time to be reduced by over 50 percent. The end customer and integrator are convinced by the robot-based solution and are not ruling out further applications.

KUKA Systems UK Ltd Tel: 0121 585 0888
Email: sales@kuka-systems.co.uk www.kuka.com

Consistent product quality at Weldability Sif

Weldability Sif has a heritage dating back to 1925 and the origins of the bronze brazing process. For almost a century, it has innovated in the development of welding products and has supported the industry with technical assistance and consistent product quality.

Wholesale Welding Supplies Ltd (WWS) was formed in 1981 by Adrian Hawkins with a sole purpose to assist distributors to obtain and promote welding products for sale. In the early years of trading, the business established a firm financial foundation and became widely known for introducing many product ranges from international sources to the UK welding market.

As the company developed, with the support of his late father, Peter Hawkins as company secretary, Keith Mullan as distribution director and an increasing, long-serving and committed team, WWS became focused on its own-brand range of accessories and consumables and continued to grow each year. In 1997, Gareth Hawkins joined the company in external sales and in 1999 Alexis Hawkins joined the internal sales team. Soon after the new millennium, the company relocated to a 35,000 sq ft office and warehouse facility in Letchworth Garden City, purpose-built and enabling further economies of scale.

Weldability product range

WWS celebrated its 25th anniversary trading year in 2006 with the third issue of its constantly-expanding Weldability catalogue. In addition to welding accessories and consumable products, the Weldability-brand range has grown to include equipment, tools and personal protective products. The business identity was changed from WWS to Weldability, to underscore the commitment and success the company has experienced with its popular own brand.

In 2007, the Company acquired Sifbronze, the welding consumables division of the Suffolk Iron Foundry, known internationally as Sif. Sif is renowned for its manufacturing heritage, and for its complete range of quality welding consumables for MIG/GMAW, TIG/GTAW, Arc/SMAW, Oxy/fuel welding and brazing, which have been used globally for almost a century. Established in 1925, Sif have been at the forefront of innovations in brazing technology and has developed a range of specialised brazing wires for use in the MIG/SMAW and TIG/GTAW processes. They are popular throughout the automotive and industrial sectors for providing strong brazed bonds on ferrous and dissimilar metals and are commonly used where distortion needs to be minimised.

Sif products in the warehouse

In 2008, Sif was wholly integrated into the Weldability operation with the company trading identity re-branded to Weldability Sif. This represented the new era of solutions in fusion that this merger signified. The unique mix of manufacturing heritage and modern distribution offered by Weldability Sif provides its clients with a comprehensive range of welding products, professionally sourced and quality controlled.

The Weldability Sif catalogue now features 2,200 products, which represent the fast-moving consumable and equipment lines sold every day in the welding industry. Weldability Sif continues to offer the broadest and most comprehensive welding product portfolio available from a single UK source and distributes via its network of trading partners, as well as through web and mail-order channels.

As The Welder's One-Stop Shop, Weldability Sif products are known and trusted by many corporations across the globe, with a vast product user customer base ranging from car hobbyists right through to large multi-national industrial gas and engineering companies.

Training centre welding bays

Offering a wealth of knowledge and experience, key members of the Weldability Sif management team have represented The Welding Institute in a voluntary capacity on several European Norm working groups and are a part of the National Association of Welding Distribution. Furthermore, Weldability Sif is a voluntary member of the HSE Welding Partnership involved in researching and managing the "Respiratory Hazards in the Welding and Cutting Environment".

Much of what Weldability Sif has achieved would not have been possible without the help and support of its experienced and attentive staff, its loyal distributors and the ultimate end-users of Weldability Sif products. This is increasingly recognised by the growing network of trading partners that have benefited from the promotion of the Weldability Sif product range.

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