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XYZ Machine Tools ready to celebrate 40 years in 2024

When Nigel Atherton started XYZ in 1984 and imported and installed his first two XYZ machines in 1986, he could not have anticipated the achievements over the next 40 years. Machine sales rapidly grew to over 50 every month but, the major change was the introduction of the ProtoTRAK® control in 1993, bridging the gap between manual machines and CNC. It set the benchmark for easy programming with machine tool sales growing from £3 million to £15 million over a five-year period. The introduction of VMCs, turning centres and its TMC range with ProtoTRAK and Siemens ShopMill and ShopTurn options saw turnover more than double again. Now the company has over 25,000 machines in use in the UK.



Each one has been commissioned and tested at XYZ's Burlescombe headquarters and is supported by its team of 16 service engineers located strategically around the country and its seven in-house specialists dedicated to particular areas of technical expertise.

As part of its commitment to customer support, XYZ Machine Tools holds £2 million of spare parts which equates to around 20,000 different parts at its Head Office enabling it to supply the majority of spare parts off the shelf for both new and legacy machines achieving next day delivery for UK orders placed before 3pm.

Around the country, XYZ Machine Tools has six showrooms and/or training centres. These are in Burlescombe, Slough, Nuneaton, Huddersfield, Livingston and Sheffield. A further five applications engineers work with the sales team to provide machine demonstrations and training either at one of these centres or on the customer's site.

Managing director Nigel Atherton says: "Right from the start, when I was selling, installing and supporting the machines myself, the key factor for success was the provision of first-class customer service in a cost effective and affordable high quality machine tool package. That approach worked in 1984 and it still works today in an increasingly sophisticated engineering marketplace.

"We are well known for precision machines which are reliable, easy to operate, simple to program and which can be delivered in a matter of days. Our objective is to fully understand the needs of our customers and provide a solution that meets those demands in a fair, transparent and ethical manner. 40 years is a major milestone, and we are looking forward to the next 40. Although I doubt that I will still be around!"

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- Measurement & Inspection
- MACH 2024 Preview
- Metal Marking
- 5-Axis Machining
- Waterjet Machining
- Cutting Tools
- Sawing & Cutting Off

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Renishaw co-founder recognised for outstanding contribution to advanced manufacturing innovation with international award



Sir David McMurtry, co-founder and executive chairman of global engineering technologies company, Renishaw, is the recipient of the I-Form Advanced Manufacturing Excellence Award 2023. The award, presented at the 72nd CIRP General Assembly hosted at University College Dublin, Ireland, recognised Sir David's outstanding contribution to innovation and research in advanced manufacturing over many decades. This year marks 50 years since Sir David and John Deer founded Renishaw, which is an industry leader in a range of engineering fields, including dimensional metrology and metal Additive Manufacturing (AM).

CIRP, The International Academy for Production Engineering, includes around 600 worldwide members with the aim to address scientifically, through international co-operation, issues related to modern production science and technology. The award was presented during the organisation's General Assembly, an annual event that brings together an international network of leading experts in production engineering from across academia and industry.

The I-Form Advanced Manufacturing Research Centre, funded by Science Foundation Ireland, is a partnership between seven educational institutes, which brings together a nationwide pool of industrial expertise in materials science, engineering, data analytics and artificial intelligence. The Centre includes a Renishaw RenAM 500 series metal additive manufacturing system, which has played a key role in doctoral and post-doctoral research projects carried out

by I-Form. These include projects related to the development of novel titanium alloy processing conditions, process monitoring, machine learning and operator feedback technologies. This partnership demonstrates Renishaw's strong commitment to industry-academia collaboration for advanced manufacturing research and innovation.

Professor Denis Dowling, director of the I-Form Centre, said: "The I-Form Advanced Manufacturing Excellence Award recognises the significant contribution that Sir David McMurtry has made to innovation and research since Renishaw was established 50 years ago. It also reflects his contribution to advancing the manufacturing sector in both Ireland and the United Kingdom. The investment in innovation and Research and Development (R&D) from companies such as Renishaw, has helped to drive advancement in the manufacturing industry and resulted in substantial economic and societal benefits."

"We pride ourselves on contributing to the global advanced manufacturing research and innovation industry," said Will Lee, chief executive at Renishaw. "This is a great honour for Sir David and Renishaw and our aim is to be able to continue making a positive impact on production engineering around the world, helping our customers to make advancements in their ability to manufacture their products accurately and efficiently."

The award was designed and assembled by Dr. Owen Humphreys from the I-Form Centre. It includes the triple spiral symbol, which is similar to that found on some Neolithic tombs, such as the entrance to the Newgrange Stone Age Passage Tomb in Boyne Valley, Ireland. This tomb dates back over 5,000 years. The spiral design for the award was 3D-printed using a titanium alloy by Irish Manufacturing Research (IMR), using its Renishaw RenAM 500M system. This alloy

was then mounted onto a mahogany base prior to the award presentation.

For further information about Renishaw and its products for production engineering, visit www.renishaw.com

Renishaw is a leading supplier of measuring systems and production systems. Its products give high accuracy and precision, gathering data to provide customers and end users with traceability and confidence in what they're making. This technology also helps customers to innovate their products and processes.

It is a global business, with over 5,000 employees located in the 36 countries where it has wholly owned subsidiary operations. The majority of R&D work takes place in the UK, with the largest manufacturing sites



I-Form Advanced Manufacturing Award collected on behalf of Sir David McMurtry at the 72nd CIRP general assembly

located in the UK, Ireland and India.

For the year ending June 2022, Renishaw recorded sales of £671.1 million of which 95 percent was due to exports. The company's largest markets are China, USA, Japan and Germany.

Renishaw is guided by its purpose: Transforming Tomorrow Together. This means working with customers to make the products, create the materials and develop the therapies that are going to be needed for the future.

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Three old men and 50 cubs



Back in September 2021, three men set out on a journey of more than 4,000 miles on Honda 50 Cubs. Starting and finishing in their hometown of Carlisle, their mission was to ride the extreme coastline of the UK on Honda 50 Cubs, retro bikes which have a maximum speed limit of 38 mph.

The three men, affectionately known as Monkey, Dee and Bowie, are all local to Carlisle and are lifelong motorcycle enthusiasts, with two working full time at Complete Engineering Services, Carlisle. They set up this challenge to raise money for causes and charities close to home and dear to the three of them. The first charity, Blood Bikers Cumbria, transports essential blood and medical supplies out of hours for the NHS in North Cumbria. This charity was chosen by Dee, a blood biker and treasurer of the charity. The second cause, the Cumberland Infirmary, Carlisle, provides lifesaving care for people every day. It was chosen by Monkey, who, in January 2021, was hospitalised with COVID-19 and was saved by the incredible staff at the Cumberland Infirmary. The third charity, Lymphoma Action, was chosen in support of a close associate of Monkey and Bowie's, Jake Jonston aged 25, who has been battling with a form of Non-Hodgkin Lymphoma. The final charity, Jigsaw Cumbria's Children's Hospice, provides essential care and support for terminally ill children and young people in the area. Motivated to raise money for these crucial causes, the team geared up and made a start to this enormous challenge.

The first leg of the journey, undertaken back in 2021, had the team start from their hometown of Carlisle and finish in Holy Island, Scotland. Travelling round some of the Scottish islands on route, the first leg of the journey clocked in at an astounding 1,434 miles. The second leg of the challenge started at Holy Island and ended in Exeter.

Travelling down the East coast of the UK, this leg of the journey totalled 1,195 miles and pushed the team well over the halfway mark of their target. The final leg of the challenge, completed in August 2023, started in Exeter. From Exeter, the team rode to Land's End and then back up the Western coastline of England and Wales to the Linton Holme Inn in Carlisle, via the Isle of Man. At the Linton Holme Inn, the team were greeted by a welcome party and celebrated their enormous accomplishment. The bikers were joined by Matt Darbyshire, technical sales engineer at CERATIZIT UK for this final leg of the challenge.

CERATIZIT has provided tooling support and technical expertise to Complete Engineering Services for many years and in that time has built a strong and longstanding relationship with the North Cumbrian company. Matt Darbyshire visits the company regularly and provides tooling and technical advice. Having heard about the challenge, CERATIZIT was keen to show its support of the fantastic causes the



men were riding for. As well as Matt Darbyshire volunteering to join the men for the final leg of their journey, CERATIZIT made donations towards the fundraising target and spread the word about what the men were doing.

Thanks to their determination and to hundreds of generous donations, Three Old Men and 50 Cubs has so far raised over £11,200 and are still receiving donations on their GoFundMe page.

If you would like to donate to Three Old Men and 50 Cubs then follow the link below.

www.gofundme.com/f/thee-old-men-and-50-cubs

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Wired for success

Unison Ltd acquires UK wire bending machinery manufacturer, Pneuform

Unison Ltd, the UK-based inventor of all-electric tube manipulation, has acquired Dorking-based wire and small tube bending machinery maker, Pneuform, for an undisclosed sum. The acquisition further underpins Unison Ltd's position as a leading manufacturer of tube and pipe bending technologies and paves the way for the company to become a key provider of machinery to the international wire bending and coil forming sectors.

As a member of the Unison family, Pneuform will benefit from direct access to the many advancements that Unison Ltd has brought to tube and pipe manipulation. These innovations will help Pneuform achieve even greater sales success going forward.

"We have known the team at Pneuform for many years and are hugely impressed by their product range, extensive knowledge of wire-forming technologies and high levels of customer care," comments Unison Ltd's joint managing director, Alan Pickering. "In welcoming Pneuform to the Unison family, we look forward to enhancing the business's

existing, excellent machine tool range with our advanced, user-friendly control systems and simulation software. With our locations in the north of the UK and in the Midlands and with Pneuform's HQ in the south of the country, we also look forward to providing Pneuform's British customers with even higher levels of service.

"The Pneuform name will be retained, as will its rich heritage," adds Alan Pickering. "While to ensure that Pneuform is able to further develop its position as a leader in wire and small tube bending machines, we have a number of new machine tool technologies in the pipeline. We are convinced these new machines will be of particular interest to organisations producing tubular components for the automotive, EV, electronics, solar energy and refrigeration industries. Further announcements will be made in due course."

Pneuform was a pioneer of CNC 3D wire bending. Today its wire and small diameter tube bending machines have become the industry standard with manufacturers of beer coolers, drink dispensers and HVAC



equipment, as well as with makers of small diameter automotive parts. Pneuform's range of wire bending machines includes rotary head models, flat rotary line bending machines and enamelled wire bending machines. Available in 2-axis and 3-axis versions, Pneuform machines cater for outside tube diameters ranging from 3 mm to 11 mm in stainless steel and 3 mm to 15 mm in copper.

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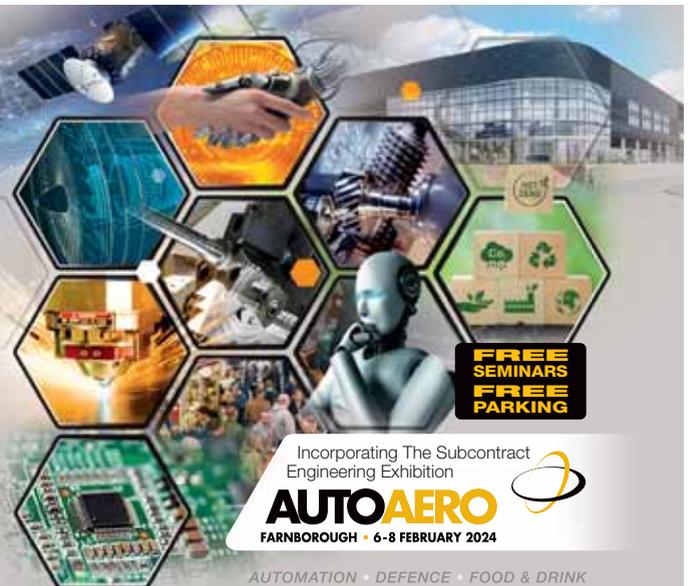
The exhibition is **free** to attend, **free** to park and easy to get to. Doors open at 9.30am on Tuesday 6th February.

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Toolmaker branches out into 5-axis machining and subcontracting

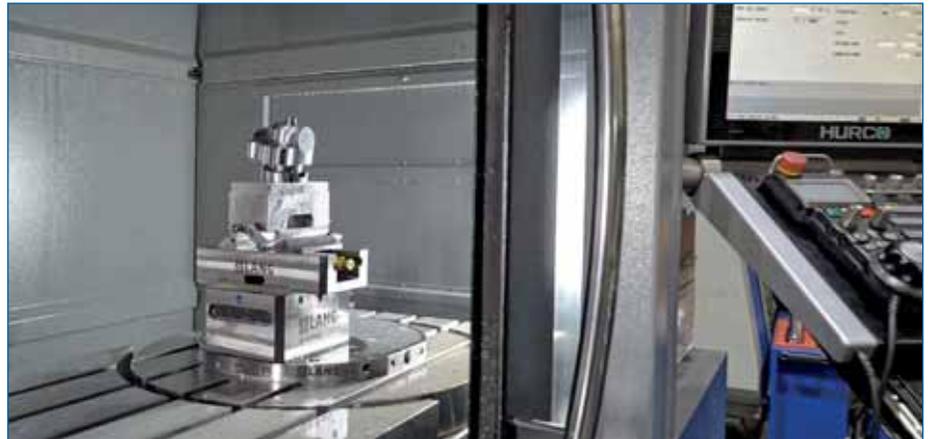
Located in the centre of Birmingham, press toolmaking company Tooling 2000 was established more than 50 years ago. Since 1996 it has focused mainly on the design, production and tryout of tools for the automotive industry, notably for Jaguar Land Rover, Nissan and Rolls-Royce/Bentley.

With a view to strengthening its position in the industry and also to break into providing subcontract machining services to other sectors such as power generation, especially renewable energy, the company has invested £1.8 million in the last two years in new plant and hiring extra people.

A significant proportion of the spend has gone on acquiring new machine tools from Hurco, notably a TM12i CNC lathe with a 12-inch chuck and the toolmaker's first two 5-axis machining centres, models VMX60SRTi and VMX42SRTi.

The SRTi configuration is rapidly becoming Hurco's most popular 5-axis model. The torque motor-driven, swivelling B-axis spindle head and 600 mm diameter C-axis set flush into a fixed machine table create a compact, high-capacity platform that can be used as a large-capacity 3/4-axis machine whenever the need arises.

Tooling 2000's manufacturing director Brian Abbott says: "In recent years, there has been a growing demand from customers for the supply of more complex components that require 5-axis machines to produce them cost-effectively.



"The technology was a step into the unknown for us, so we needed to know that we would be supported by the machine supplier. As an existing Hurco user, we were comfortable with sourcing our first 5-axis machines from them, particularly in view of the user-friendly, twin-screen controls."

Machine operator Dean Henning adds: "Hurco machines are best suited to our type of work because the conversational control with WinMax software is easy to use and we can program most jobs on the shop floor. Even on the 5-axis models we can use the Hurco control to program 3+2-axis cycles.

"For more complex work, the option of inputting a DXF file from CAD into the Hurco control and using the drawing as the basis for creating the part program is especially useful and fast.

"Once the features are extracted, the WinMax software automatically generates cutter paths to complete the cycle in the quickest possible time."

He also likes the functionality of the interrupt button, which when pressed causes the cutter to retract from the job during the cycle and stop. It is then an easy matter to check that the program is progressing as planned and press cycle start again to resume metalcutting from the same point as the tool was stopped.

Additionally, a large, 3-axis DCX42i travelling-column machine with X/Y travels of 4.2/2.6 m and a maximum table load of 16 tonnes was installed in 2020 to provide capacity for producing larger press tools and components. Currently the largest machine available from Hurco, it has a 10,000 rpm spindle with BT50 interface and a 40-position tool magazine. The availability of this capacity sets Tooling 2000 apart from much of the competition in the area.

Brian Abbott concludes: "Not many suppliers offer this size of machine at an affordable price. We visited Hurco and it was our operators who chose the DCX because they like the flexibility of the control.

"It helps them to program parts without making mistakes, which would be costly in the case of these large components. The machine also has excellent swarf removal and holds very tight tolerances."



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5-axis travelling-column machining centre offers versatile production options

A new, larger size of travelling column machining centre in the DMF range manufactured by DMG MORI has been introduced to provide even more versatile production opportunities within a machining envelope of 3,000 x 1,100 x 1,050 mm.

The modular DMF 300|11 with B-axis swivelling spindle head represents a redesign of the popular configuration that, compared to the previous series, has seen not only an expansion of 40 percent in the working volume, but also a 20 percent increase in rigidity of build.

The ± 120 -degree B-axis houses an integrated, 15,000 rpm speedMASTER HSK-A63 spindle as standard, but is available with a 20,000-rpm version, or with a 12,000 rpm powerMASTER spindle having higher torque at 288 Nm.



The new DMF 300|11 enables high-precision machining within a working volume of 3,000 x 1,100 x 1,050 mm. A constant overhang in the Y-axis allows milling at maximum power at every position

The rigid table running the length of the DMF 300|11 accepts workpieces weighing up to 5,000 kg for 3- and 4-axis machining of large components. Alternatively, an optional partition can be inserted in the centre to allow safe pendulum machining of smaller parts, with setup of the next job at one end of the table while production is in progress at the other.



Tool change now takes place safely behind the work table, avoiding interference with fixtured workpieces and contributing to thermal stability

Fully interpolative 5-axis machining can take place at either or both ends, or else in the centre, following the addition of one or two optional rotary tables set flush into the main table surface. Components weighing 1,200 kg can be accommodated and each C-axis may be ordered with a torque drive to provide the possibility of in-cycle turning operations at up to 700 rpm.

Alternatively, it may be more expedient to add one or more A-axis rotary tables to enable 5-axis operations on horizontally-mounted parts weighing up to 500 kg. It is equally feasible to mount a static column or tombstone on the table for workholding.

Tool exchange now takes place behind the table for increased reliability and this design alteration has been adopted in the smaller DMF models as well. Mounted inside the column, the standard tool magazine has 40 pockets for cutters up to 400 mm long. A larger magazine with capacity for 120 tools may be specified.

Rapid traverse in all axes using ballscrew drives is 42 m/min, although if optional linear drives are fitted in X- and Y-, the rapids are 80 m/min and 60 m/min respectively.

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Complete machining of crankshafts in small series

As the energy sector continues to advance, efficient and high-precision methods of producing components are a crucial aspect. One area that requires special attention is the machining of crankshafts. WFL Millturn Technologies is responding to this need by offering ground-breaking solutions for the complete machining of crankshafts in small series.

A MILLTURN provides the best alternative to conventional production methods for the complete machining of crankshafts, including deep hole drilling of oil ducts or gearing. Based on many years of experience and the use of flexible and multifunctional complete machining centres, WFL can produce prototypes and small series of crankshafts efficiently. Whether for high productivity rough turning or precision pre-finishing, all crankshaft geometries can be completely machined in a MILLTURN from WFL.

High potential for savings

The complete machining of crankshafts requires maximum accuracy and reliability. Conventional methods use several steps to machine crankshafts, with various specialised machines and processes coming into play. While this approach delivers a high output, it lacks flexibility and is therefore only suitable for large series. The production of crankshafts is a highly complex and relatively inflexible process both on highly specialised machines designed for series production and on all-purpose machines for small series and prototypes.

The use of MILLTURN complete machining centres together with efficient technologies allows WFL to combine the entire machining process in one machine in just a few clamping operations. WFL machines can handle all the steps required to produce a crankshaft. A single machine carries out milling, boring, turning, deep hole drilling and measuring from the blank to the nearly finished product. In addition to significantly reducing the production time, this also enhances the quality and precision of the crankshafts. Final heat treatment and the grinding of the crankshaft bearing and crankpin are the only



separate processes.

Complete machining eliminates the time-consuming process of moving between different machines and the setup time this involves. This significantly boosts production capacities and reduces overall costs. At the same time, the machine's high level of precision minimises the risk of errors and ensures the consistent quality of the crankshafts thanks to measurements carried out in the machine.

The potential for savings is considerable when machining crankshafts in a MILLTURN compared with conventional production on multiple machines. A 60 percent saving can be achieved in the process chain thanks to complete machining and this figure is even 80-90 percent for the setup time.

The crankshaft profiler

Machining crankshafts is a demanding process that not only requires perfect tools but also the relevant software to be successful. WFL's cycle packages make crankshaft machining especially simple and cost effective. These cycle packages contain cycles for pre-roughing crankshaft bearings and bearing grooves, a web milling cycle and rounding of oil holes with radius cutter or corner rounding end mill.

All the advantages at a glance

Increased efficiency

Carrying out all machining steps in a single machine significantly shortens the production time. This eliminates the time-consuming process of moving from one machine to the next. Setup times are reduced to a fraction of what they previously were.

Cost reductions

Integrating multiple machining steps into a single machine not only reduces labour and machine costs but also warehousing expenses for intermediate products.

Higher quality

Combined with efficient technologies, complete machining centres create the conditions for machining crankshafts with greater precision. The risk of errors and irregularities is minimised, resulting in components of a consistently high quality.

Flexibility

Complete machining centre solutions can be tailored to specific customer requirements. Machines from WFL are suitable for machining various types of crankshafts and are capable of adapting to product modifications.

Time savings

Using a single machine for the complete machining process speeds up the development of new models as the machine can be adapted in a flexible manner.

Sustainability

Combining multiple machining steps in one machine reduces energy consumption and wasted material, creating the conditions for a more sustainable production process.

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ETG introduces 5AX double-column machining centre

Now available from the Engineering Technology Group (ETG) is the new DC12 model, a 5AX double-column vertical machining centre from AXILE. Renowned for its flexibility, performance and technology, AXILE has rolled all of these attributes into a machining centre that can cater for large-part processing.

The DC12 is the largest machine in AXILE's arsenal, perfectly suited for handling heavy, lengthy workpieces. With a maximum table loading weight of 2.5 tonnes and a maximum component length of 2.2 m, a workpiece diameter of 1.3 m on a unique built-in rotary table of 1.2 m, the DC12 takes on the larger, heavier parts common in the aerospace, power generation and mould and die industries. The double-column bridge construction provides greater rigidity, as well as exceptional control over thermal deformation based on its massive RAM built as box-in box concept. As a result, the DC12 is capable of both heavy-duty cutting and complex contouring while maintaining remarkable precision levels.

With larger workpieces come more chips, meaning the DC12 features excellent chip removal efficiency, to prolong tool life and ensure no residual interference. So, when it comes to creating chips and offering high levels of material removal, the DC12 outperforms its rivals. To remove chips the DC12 has a chip auger, chip conveyor, through spindle coolant, four coolant outlets at the spindle nose, air flushing and chip wash down facility. Therefore, the DC12 delivers the high surface quality expected by leading manufacturers.

Despite its dimensions, the DC12 incorporates directly driven servomotors, roller-type linear guideways, pre-loaded double nut ballscrews and linear scales on X, Y and Z axis with 0.1 micron resolution. These features ensure that regardless of the size of your parts, the DC12 will deliver astounding levels of precision and repeatability. From a flexibility perspective, the DC12 presents an HSK-A63 swivelling head B-axis as well as a rotary C-axis table built into the large machine bed. This combination provides



unparalleled flexibility for large-part machining. The spindle can be supplied with up to 90 or 120 HSK-A63 tools or 60 HSK-A100 tools, depending on the option selected by the customer.

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Dugard delivers the solution

Founded in 2005, DGF Engineering Ltd has been on a continuous growth trajectory and at every step of the way, the Hertfordshire manufacturer has turned to Dugard for its industry-leading machine tools. The company started its investment in Dugard machines with the Dugard 1000 3-axis VMC, this has since been followed by a SMEC SL 2000M turning centre and now a smaller Dugard 550 machining centre.

The acquisition of the SMEC SL 2000M turning centre in 2022 was due to the turned components at DGF Engineering increasingly needing secondary milling operations on machining centres. To free up milling capacity, the Royston-based subcontractor that produces a diverse range of components for a variety of industry sectors believed the Dugard SMEC would make a major difference and it has.



Liam Fernard from DGF with the SMEC turning centre

Recalling why the company invested in a live turning centre, Liam Fernard from DGF Engineering says: "Turning work with milled features were tying up our CNC milling department for too long and we needed a solution with live tooling. As we were happy with the service that we received from Dugard on our Dugard 1000 3-axis VMC, we naturally looked at their lathes and the SMEC SL 2000M turning centre ticked all the boxes."

With the service, support and reliability of Dugard being as robust as the machines, the company turned to Dugard once again when it needed additional milling capacity. Discussing the latest acquisition, Liam Fernard says: "We bought the Dugard 550 for several reasons, one being the small footprint. We didn't have a huge amount of room and the machine that the Dugard 550 replaced was only a small machine. A lot of the work we do is quite small components, so we didn't need a big bed and big footprint



The Dugard 550 at DGF Engineering

machine like our Dugard 1000. So, this machine ticked all the boxes and it fits exactly where we wanted it."

Discussing the work the company is machining at present, Liam Fernard states: "As a subcontractor, we will typically machine anything, but our main industry focus is the scientific, liquid and gas testing industries but then we could also be doing work for a farmer down the road. We machine a wide range of materials that include aluminium and stainless steel and for a small machine the Dugard 550 handles stainless steel very well. The machine has a 10,000 rpm spindle, the horsepower is very good and it will cut all day long."

Referring to why the company has purchased yet another Dugard machine, Liam Fernard adds: "We have been really impressed with the first two Dugard machines we bought and the service has been great. The machine it replaced was



The spacious work area of the Dugard 550



The new Dugard filtration system on the Dugard 550 machine

getting a little bit old and the spindle was only 6,000 rpm, so it just wasn't machining how we really wanted to. From experience, the first place for us to go was Dugard to see what they had available and the Dugard 550 ticked all the boxes."

From order to delivery, the machine was on the shop floor in a matter of weeks. As Liam Fernard explains: "The machine was a stock model in their showroom and as soon as we were interested, we paid a deposit and it was just a case of sorting things out here to make sure we could get the machine placed. Dugard delivered the machine and took the old machine away and they re-sited another machine for us. It was all done and dusted in one and half hours. As a company, Dugard understands we have to make money and downtime loses money, so they do everything in their power to get us up and running as quickly as they can."

Liam Fernard concludes: "The machine was delivered with the filtration system already fitted and as we were very happy with immediate results, we asked Dugard to retrofit filtration systems to our other machines. This was done a day after the Dugard 550 machine was delivered and installed. The service has been fantastic and whenever I speak to anyone who is looking for a machine, I always recommend Dugard because they haven't put a foot wrong for us."

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Small 5-axis machining centre packs a real punch

Mills CNC, the exclusive distributor of DN Solutions (formerly Doosan) and Zayer machine tools into the UK and Ireland, has recently introduced a new simultaneous 5-axis machining centre into the market.



The DN Solutions' DVF 4000 is the latest addition to the company's best-selling DVF-series of 5-axis machining centres and, with its compact size and impressive technical specification will, no doubt, become an instant hit with component manufacturers looking to improve their productivity and process efficiencies.

The DVF 4000 is powerful, fast, flexible and reliable. It is the ideal solution for the efficient processing of parts that require multiple machining operations and reduces the number of setups required to machine such parts to completion.

The machine is supplied with a 12,000 rpm (BT 40) directly coupled spindle, as standard, powered by an 18.5 kW motor that generates 118 Nm of torque.

The FANUC 31i-Plus control enables the DVF 4000 to be used in full simultaneous 5-axis machining mode with advanced contouring capabilities.

The DVF 4000 is equipped with a 400 mm diameter, built-in rotary tilting table with a zero-backlash roller gear cam design that delivers improved speed and reliability.

Productivity and process efficiencies are further realised with the machine's 60-tool, servo-driven automatic tool changer and an integrated thermal compensation system, comprising six sensors strategically located within the machine, that combat thermal drift issues in real time.

Roller LM guideways deliver improved speed and rigidity and linear scales on the machine's X-, Y- and Z-axes and rotary scales on its B- and C-axes, ensure accurate positioning and repeatability.

Tony Dale, Mills CNC's CEO says: "A fantastic addition to what is already a market-leading 5-axis machine tool range. The compact DVF 4000, available at a competitive price, provides component manufacturers with a highly-functional 5-axis machine tool solution that will help transform their machine shops' productivity, performance and profitability."

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Subcontractor finds that 30-taper machining centre is the clear choice for volume production of commercial aerospace components

30-taper machining centres these days are much more robust than formerly and are not only fast but can also cut tough materials. One company that has discovered the merits of this type of prismatic machining equipment is Staffordshire Precision Engineering (SPE), Newcastle-under-Lyme. The subcontractor recently purchased a Brother R650X2 30-taper 4-axis machining centre with a table-mounted indexing trunnion from the Japanese manufacturer's sole sales agent in the UK and Ireland, Whitehouse Machine Tools, Kenilworth. Programming support and unlimited training were included in the deal.

Installed at the end of March 2023, the machine is the subcontractor's first 30-taper machine and is being put to work producing aluminium parts for the aerospace, Formula One, high-end automotive, scientific, medical and other industries. The material currently accounts for about 60 percent of prismatic component production in the factory. However, it so happened that the first job put on the Brother involved the production of a batch of 304 stainless steel pivot blocks for an aerospace customer.

It was at this point that Phil Smith, joint managing director of SPE with his brother Gary, realised that he had been harbouring an incorrect view that 30-taper machines are unable to cut tough metals productively. He is now convinced that modern Brother machines with their high-torque spindles are much more robust than he thought, capable of cutting stainless steels, titanium and other difficult alloys, just not heavy cuts in those materials all day long; that type of work would be put on a 40-taper machine. Being able to tackle a wide variety of materials ideally suits a machine to production in a subcontracting environment, where the mix of work coming in is unpredictable.

There are twelve 40-taper 5-axis machines in operation on SPE's shop floor, some with automatic twin pallet change and others with multi-pallet magazines. These reflect the company's decision in 2016, when it moved into a £1.2 million, 26,000 sq ft factory, to target more complex prismatic machining work.

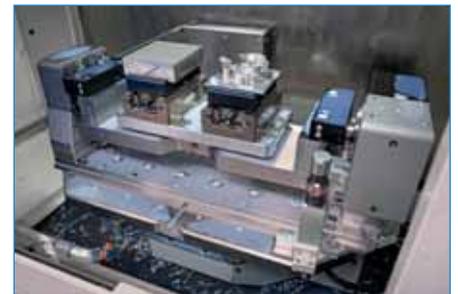
There are also eight 40-taper 3-axis VMCs



on site, some with a fourth CNC axis, that are between 10 and 15 years old and these will gradually be replaced by more capable and productive plant. Phil Smith predicts that the 4-axis Brother will do the work of two of these older models. It produced the aerospace pivot block, for example, in two operations in a total cycle time of 15 minutes, whereas one of the older machines took 38 minutes to produce the part in four operations. Moreover there is now far less workpiece handling and work-in-progress, as well as minimal risk of accumulating dimensional errors through repeated setups.

Apart from speed and versatility, another facet of the Brother machine that Phil Smith particularly appreciates, especially with energy prices presently so high, is that the 30-taper machine draws typically 80 percent less power than a 40-taper VMC. SPE's electricity bill more than trebled from £9,000 to £28,000 per month between December 2022 and May 2023. So it is clear that low energy consumption is no longer merely an added bonus but just as critical to manufacturing parts cost-effectively as fast cycle times.

It was the high speed of the Brother machining centre that was central to Phil Smith's decision to make the investment. He says the machine is "remarkably" faster than



a 40-taper model, thanks to its dynamics. This is due to 2.2 g linear axis acceleration, 0.2 second spindle acceleration to 16,000 rpm, simultaneous tool changing, 0.7 second and repositioning of the spindle for the next cut and reduced machine downtime for tool replenishment thanks to the 40-station tool magazine. 14 or 22 tools are optional and the 2APC arrangement means that there is only a short delay before the first cut is taken on the next part.

The high productivity enables Phil Smith to keep the prices he charges customers at a constant level, despite the surge in material and energy costs and is also helping him to win new business.

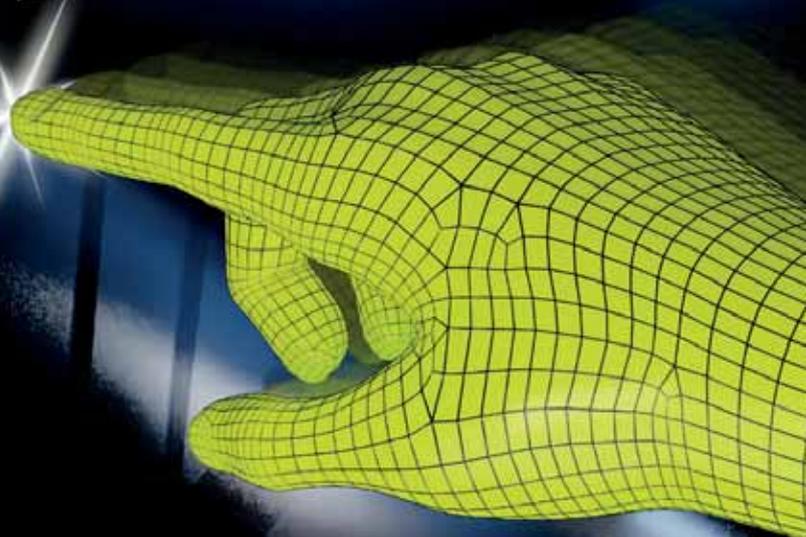
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Starrag Tech Days demonstrate machines and technologies that push up customers' productivity

Push Your Productivity was the theme this year of Starrag's Tech Days, a manufacturing extravaganza Open House at the company's headquarters in Switzerland. Numerous machines and complementary manufacturing technology demonstrations highlighted how customers can benefit with shorter lead times and lower piece part costs from Starrag's supremacy in the machining of aero components such as blades, blisks, impellers, casings and structural parts.

The 250 plus visitors from 17 countries witnessed a seemingly endless flow of manufacturing expertise to help them achieve bottom line savings in the production of such workpieces and the highlights included:

- The launch of the new ultra-rigid and robust titanium-cutting horizontal machining centre, the STC 1250 HD, the first machine in its class with hydrostatic guideways boasting zero friction/non-stick/slip in the X axis. The result is unmatched roughing times and dynamic, precise finishing of parts reducing roughing times by over 50 percent in some instances. In addition, the machine's higher acceleration and jerk rates lead to more dynamic finishes and frictionless/no micro-vibration in the guideways leads to more precise parts.

- An Ecospeed F machining centre, the latest addition to the machines in the facility's Aerospace Competence Centre, with integrated Sprint Z3 parallel kinematic machining head which, for example, contributes to savings in machining time for an interior aerostructure part from 14 hours to just three hours and 40 minutes.

- Simultaneous 5-6-axis machining of landing gear parts on large-capacity mills, focusing not only on improved cutting of complex shapes in difficult materials but also on the challenges of producing higher volumes, using automation, often in new materials in response to the impact of ReACh regulations and, as always, under extreme price constraints.



There were presentations of how Starrag machines can improve productivity including how a Droop + Rein FOGS machining centre is meeting the challenges of machining and matching aluminium alloys and carbon fibre parts to an accuracy of 55 microns over a machining envelope of 22 m³. While a 65 mm bar-fed LX 021 machining centre produces

variable guide vane blades measuring 115 mm long, with aerofoil lengths of 70 mm and chords up to 21 mm wide. The machine was performing, facing, profiling, mill finishing and groove turning in a cycle time of just 21 mins and it featured milling force monitoring via a ProMicron system.

Siemens demonstrated its Sinumeriuk CNC system with Digital Twin software which effectively creates a closed loop between digital design, machining simulation, CAD/CAM and post-processing to not only minimise the programming of complex parts but also to eliminate costly material test cuts.

Caron Engineering showed how its Tool Adaptive Control system can run tools at up to 25 percent higher rates and extend tool life by up to 25 percent by process monitoring via sensors for power usage, vibration and coolant pressure and flow.

Live demonstrations showcased the impressive capabilities of the new STC 1250

HD on titanium using porcupine, face and rigid milling tools and how its 12-tonne column can be easily moved by hand. The machine, the first in its class featuring hydrostatic guideways with zero friction/non-stick/slip in the X axis, so, no wear and reduced maintenance compared with conventional box guideways, achieved unmatched roughing times and dynamic finishing of resulting more precise parts. Indeed, it is capable of reducing roughing times of structural parts by over 50 percent.

On one test part, a frame door forging of Ti6Al4V and measuring 80 mm deep x 300 mm wide and 1,220 mm long, the machine's roughing and machining time savings also demonstrated a 33 percent reduction in energy consumption.

With pallets of 1,000 mm by 1,250 mm capable of accommodating workpieces up to 2,200 mm by 1,950 mm, the machine has a torque rating of 30,00-50,000 Nm, a 80 mm drive chain and it can achieve roughing cuts up to four times deeper in titanium than traditional machines.

The in situ Ecospeed F 1540 machining centre is the smallest of the Ecospeed family but like its stablemates, uses Starrag's Sprint

Z3 machining head to impressive effect. The Ecospeed is unmatched at aluminium removal, hence the dramatic time saving of the aerostructure part from 14 hours to just three hours and 40 minutes.

Starrag has been meeting the challenges of landing gear machining since the early '90s and today utilises simultaneous multi-axis machining, in one case, on a Droop + Rein FOGS HD mill, simultaneous 6-axis operation, to produce the highly-accurate complex shapes in difficult materials, as well as STC and Heckert machining centres for smaller workpieces, the latter undertaking turning as well as milling.

By understanding the challenges and combining highly-efficient machines and tooling, Starrag emphasised that it cannot only improve cycle times but also cut the number of tools used and reduce the loads on those tools, which equates to higher tool life and lower overall tool costs.

The keynote address at the two-day event by Dr Matthias Lange from Premium Aerotec, formerly part of Airbus, not only highlighted the rising demand for passenger aircraft, forecast to be 40,000 new aircraft for delivery between 2022 and 2041, but also pinpointed

how this best-in-class Tier One aero machinist is driving up sustainability in its own manufacture. This complements the engine manufacturers' quest for fuel burn reductions of 20-40 percent and, for example, improved end-of-life recycling, optimised noise and emissions and improved design and manufacturing methods as well as more effective and efficient supply chain initiatives.

The company annually produces around five million parts in 25,000 variants at different locations in Germany and Romania and it uses 21,000 cutting tools on its production lines of Starrag machining centres. Its 24 machines include: Ecospeed machining centres with Z3 heads and integrated coordinate measuring machines processing 'batch products', stand-alone machines for urgent parts, seven dedicated to titanium machining and 11 multi-tasking turn-mill machines for rotational workpieces.

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Ceramic end mills help optimise aerospace component machining

As components made from nickel-based alloys become increasingly prevalent across the aerospace industry, demand for optimised cutting tools continues to grow. But, despite their advantages, nickel-based materials exhibit poor machineability due to their low thermal conductivity, potential for adhering to cutting tools and the presence of abrasive particles within the alloy structure. Due to these issues, productivity with carbide tools tends to be low. In addition, part complexity means that some components demand extended reach.

Here, Henri Sevonen, senior industry segment manager in aerospace for Sandvik Coromant, explains how new ceramic end mill technology has emerged to help meet these requirements, with the potential to optimise the machining of aero-engine parts and provide significant competitive gains.

Most aerospace parts are manufactured from Heat Resistant Super Alloys (HRSAs) and nickel-based alloys, which place a particular set of demands on production engineers looking to manufacture components like spools, turbine disks, combustion casings and blisks. Although many manufacturers use conventional solid-carbide end mills, such tools have their limitations in terms of performance when it comes to nickel-based alloys.

In a highly competitive global arena, aerospace machine shops are looking for next-level technologies that are capable of delivering a step-change in factors such as productivity and/or tool life. Ceramic end mills can provide that very leap, offering up to 20-30 times more machining speed, in comparison with solid-carbide tools for operations such as shoulder and face milling. Such impressive gains can be achieved largely because ceramic cutters retain their hardness at the high temperatures which arise when machining nickel-based alloys.

The brazed ceramic CoroMill® 316 exchangeable-head end mill for roughing operations is a productive solution for aerospace engine applications in ISO S materials. In the first instance, the exchangeable head concept facilitates inherent process flexibility. Also available is a six-flute version with a straight corner radius that delivers highly productive side milling



operations and a four-flute version designed to boost face milling thanks to its high-feed face geometry.

The ceramic substrate of the end mills allows for a different cutting process in comparison with traditional solid-carbide tools. Importantly, the unique S1KU SiAlON grade is purpose-designed for the superior machining of nickel alloys and is supported by negative geometry that provides a tough cutting edge. The latter also features a T-land for stable operations.

SiAlON carries a chemical composition of aluminium oxide and silicon nitride, Al₂O₃+Si₃N₄, a combination that promotes high wear resistance, even at elevated temperatures.

Stable machining

A stable setup is advised in all cases and always without coolant application; machine shops should use pressurised air instead as coolant would simply burn at the high temperatures involved. In addition, the use of coolant promotes thermal shocks and has a negative effect on tool life. Importantly, high spindle speeds are required, of at least 13,000 rpm. Further recommendations include the use of down milling, as well as a programmed tool path that keeps the tool in constant contact with the material.



It is clear that nickel-based alloys will play a vital role in the future of aerospace manufacturing. However, there are many challenges facing those tasked with producing aerospace engine components. It's only through continued tooling innovations, such as ceramic end mill technology, that aerospace machine shops will be able to optimise the machining process.

CoroMill 316 is part of Sandvik Coromant's optimised solid round tools range, visit the website for more information. Or, visit Sandvik Coromant's aero engine applications knowledge resource [aeroknowledge.com](https://www.aeroknowledge.com)

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thyssenkrupp Aerospace and Boeing sign contract to extend long-term partnership

thyssenkrupp Aerospace and the Boeing Company have signed a contract extension, continuing their partnership that has stood since 1998. Based on the agreement, thyssenkrupp Aerospace, part of thyssenkrupp Materials Services, the largest materials distributor and service provider in the western world, will continue to provide dedicated supply chain management services, supply raw materials and offer value-added services to Boeing and its worldwide network of subcontractors.

thyssenkrupp Aerospace works to ensure a secure supply to Boeing by leveraging its worldwide network. This includes operating multiple facilities across North America that are entirely dedicated to providing raw material and value-added services to Boeing and its subcontractors in North America, Europe and Asia. From these sites, thyssenkrupp Aerospace oversees the material management for Boeing for the supply of aluminum flat and extrusion products and titanium.

thyssenkrupp Aerospace manages a global



control tower for Boeing's materials supply chain, delivering solutions that go beyond the value-added services of a traditional materials distributor. thyssenkrupp Aerospace provides supply chain and materials optimisation with a high focus on reducing risk, maximising efficiency, managing and delivering materials and parts exactly where and when they are needed. The company uses big data and advanced analytics to ensure material supply for Boeing amid global constraints and fast-changing economic and geopolitical conditions.

Patrick Marous, thyssenkrupp Aerospace CEO, says: "We have been working in close

partnership with Boeing for more than 25 years and our relationship has demonstrated time and again to be effective at mitigating disruptions to the aerospace industry. This contract shows our continued commitment to providing long-term stability for Boeing's supply chain."

"We are delighted to continue this long-term partnership with thyssenkrupp Aerospace," says Jeff Carpenter, senior director for contracts and category management at Boeing. "With the dynamic nature of the aerospace industry, the flexibility inherent in this partnership supports our changing and evolving needs."

The raw material for Boeing's large network of subcontractors is managed by thyssenkrupp Aerospace, which allows for total demand aggregation, the ability to plan for ramp-ups and downs, reduced lead times and other optimisations.

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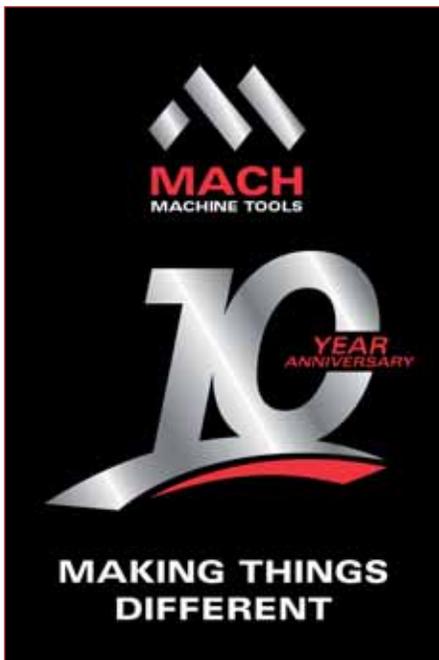
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A perfect ten



MACH Machine Tools celebrates its ten-year anniversary proving that the key to longevity and success is down to providing high-quality, technically excellent machine tools backed by best-in-class, value-added after-sales service and support.

MACH Machine Tools, a leading supplier of CNC and manual machine tools and machine shop equipment to UK, Irish and European component manufacturers and part of the Vigilance Group, celebrated its 10-year anniversary in September.

The milestone represents a considerable achievement for the privately-owned, Bristol-based company and is testament to the depth and breadth of its unique and constantly-evolving product portfolio, its commitment to providing technically-excellent machine tools backed by best-in-class after-sales service and support and its ability to anticipate and respond quickly to the changing needs of UK manufacturers.

Ten years ago, MACH Machine Tools was a very different entity to what it is now. Established in 2013 by current sales director Matt Andrew and business partner Marc Bowers, the family-owned company was definitely the 'new kid on the block' in the machine tool sector and began life supplying MACH-branded manual milling, grinding and sawing machines to UK manufacturers.

At that time and, incidentally, for a couple of years afterwards, the company's

best-selling and most popular machine tool in its portfolio was its iconic MACH VS-1 turret-type milling machine.

Available at a competitive price and equipped, as standard, with a range of impressive, high-quality features, i.e. variable-speed R8 spindles, Acu-Rite DRO's and glass scales etc, VS-1 milling machines soon became a mainstay manual machine tool solution for many component manufacturers' toolrooms and machine shops. They also became a staple for a considerable number of schools, colleges and universities looking to revamp their respective engineering departments with accurate, reliable, versatile and economically-priced manual mills.

Providing competitively-priced, high-specification machines with many features supplied as standard, as opposed to being optional extras, has become a hallmark of MACH Machine Tools ever since its incorporation.

"It's no exaggeration to say", explains Matt Andrew, "that our VS-1 machines took the market by storm.

"By early 2015 we had sold 50 x VS-1 machines into the market from what was, in effect, a standing start."

With the company becoming more established and its reputation growing, MACH Machine Tools soon augmented its product portfolio with the introduction of a series of manual lathes: L-1340/L-1550 and L1860/1880 and belt liners. It also



strengthened its machine shop equipment range with the inclusion of high-quality double-ended grinders, guillotines, garage presses and band saws.

"Our intention was to become a one-stop-shop for manufacturers and education establishments looking to improve their machining capacity and capabilities", Matt Andrew says.

It was at this time that the company also relocated its operations to a larger facility in Bristol, its current home. The move, calculated to meet its future growth objectives, enabled MACH Machine Tools to hold more machines in stock as well as comfortably accommodating its growing workforce.

While manual machines and machine shop equipment were the company's primary focus for the first few years, 2017-18 was a real watershed for MACH Machine Tools and saw it begin to supply a range of CNC machines into the market.

Matt Andrew continues: "To meet market demand for high-quality, technically excellent and competitively-priced CNC machine tools, we introduced MACH-branded ranges of CNC lathes and vertical machining centres into the market. The CNC machines complemented our manual machine tool ranges and enabled us to provide a more comprehensive offering to customers."

Initially the company's CNC machines comprised FANUC- and Siemens-controlled MACH 510MM, MACH 710MM and MACH 1062-HD machining centres and MACH S-202 and MACH SL-203B lathes.

Matt Andrew states: "We introduced many of these new machines to UK audiences, for the first time, on our stand at MACH 2018 and the interest from visitors was phenomenal.

"The machines, backed by our proactive after-sales service and support, provided manufacturers with a 'real alternative' and helped solidify our position as a



technology-provider-of-choice with many of them.”

If 2017-18 was a watershed moment for the company, then 2019 was truly ground-breaking with a number of new machine tool ranges being introduced into



the market. These included MACH MDT knee mills and MACH MDM bed-type toolroom milling machines, both equipped with the advanced WinDelta, DynaPath control.

The powerful, versatile and easy-to-use DynaPath control system with its simple-to-understand menus, on-screen graphics and conversational and ISO/G-code programming capabilities significantly differentiated MACH machines from the competition.

Matt Andrew says: “Right from the off, we could see the huge potential of the DynaPath control system and made the decision to focus all our efforts into supplying and supporting DynaPath-controlled machines into the market.”

From efficiency, logistics and economies of scale perspectives this made perfect sense and enabled MACH Machine Tools to really push its DynaPath range of CNC controlled machines into the market and concentrate its sales and service resources into making this a success.



The rest, so they say, is history. Over the last four years the company’s range of DynaPath-controlled machines has grown exponentially. Through working closely with DynaPath, MACH Machine Tools now offers a comprehensive range of machines to customers.

From the toolroom mills range MACH MDT, MDM and MDS series of machines, through to its MDL range of lathes and from its MDHS- 65S high-speed machining centres to its recently introduced MDV 800 and MDV 1100 rigidly designed and built, production-orientated vertical milling machine series, the company’s range of DynaPath-controlled machines is impressive and new models are constantly being added to it.

Similar developments and improvements have been made to the DynaPath control itself over the same period, increasing the performance and functionality of the machines equipped with it, making them even more of an attractive proposition and investment.

As well as its 8Gb on-board program storage facility and 1,000 block look-ahead capability, 10,000 block look ahead on the MACH MDHS high-speed series, that ensure fast processing speeds resulting in improved contour accuracies and superior surface finishes, the DynaPath control provides customers with fast Wi-Fi enabled, remote 24/7 diagnostic, applications and monitoring help and support.

Mat Andrew explains: “This is a real game-changer. This level of support is unique in the industry and means we can respond to customers’ queries within 20 minutes.”

With quick and reliable machine tool servicing being high on every manufacturers’ agenda, the guaranteed level of support provided to MACH Machine Tools’ DynaPath customers will spearhead the company’s future growth ambitions.

Summary

The last ten years have been exciting and eventful for MACH Machine Tools.

The company’s product portfolio has



increased and improved significantly and its range of CNC machines provided to customers is now exclusively DynaPath focused. MACH Machine Tools’ manual machine tool ranges have also undergone similar upgrades and improvements and, in 2022, a new Trainer Lathe series aimed primarily at the education sector was introduced.

Having successfully negotiated its way through the pandemic and now having a well-resourced service and applications infrastructure in place, means that the company is well positioned to meet its future sales growth objectives.

New sales positions created in the North of England and in the Midlands will increase market coverage and market share and the company is actively exploring opening a sales office and showroom in the US to meet anticipated demand from the North American market. Watch this space for more news on the MACH USA development in the coming months.

Never a company to rest on its laurels, MACH Machine Tools is now looking forward to the next ten years starting off with the MACH 2024 show in April where the company will be introducing a new range of 6”, 8” and 10” chuck slant-bed DynaPath-controlled lathes.

With the company’s constantly evolving and improving product range combined with its unwavering commitment to customer care and satisfaction, no-one would bet against MACH Machine Tools being a huge success in the decade ahead.

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XYZ Machine Tools help PJ Innovations make lots of dough

If you have ever eaten pizzas, pittas, tortillas, naan bread, subs, bread rolls or bagels, the dough used to make these baked goods could have started out going through a dough divider rounder made by PJ Innovations. Dough divider rounders accurately portion the dough ball between 28 and 350 grams, depending on the finished product and deliver a precise round ball of dough for further shaping, for example into a tortilla or a bagel which is then baked to produce the finished product.

These machines and the spare parts for the hundreds of thousands of compatible machines in use around the world are manufactured at the company's Market Deeping factory near Peterborough. With customers all around the globe it manufactures complete dough divider rounder machines but, a large proportion of its business is spare parts and it has built its reputation on rapid response and design innovations such as combining several components into one. The benefit of this service is clear when the rate of production can be up to 36,000 dough balls per hour. Downtime on these machines is expensive, so fast delivery of spares and easier part replacement and maintenance is very important for customers to enable them to get working again as quickly as possible.

When the company was formed in 2014, it subcontracted all the component manufacture. It started investing in XYZ Machine Tools in 2016 to bring some of the work in-house. The company first purchased an XYZ PROTURN SLX 425 lathe with ProtoTRAK® which it uses for turning large shafts 90 mm diameter and 1 m long in batches of 3 to 4 or up to 100 and nylon up to 200 mm diameter for the division blocks which size the dough balls. The machine is a gap bed lathe with a capacity of 2 m and swing over the bed of 480 mm. The extra length gives options for longer shafts. The operator has 20-30 tools ready set, so switching between programs stored in the control unit takes just 5-10 minutes.

For frame plates and the many parts which require lots of drilling, tapping and boring the company has an XYZ SMX 5000 with ProtoTRAK which has a 1,930 mm x 356 mm table. Programming is done on the control



and fast changeover between jobs makes this machine ideal for 1 offs and low volumes of the around 500 different parts which go into a dough divider rounder.

The most recent acquisition is an XYZ 1000 TMC with ProtoTRAK RMX control. James Goode, manufacturing manager says: "The tool changer speeds machining up a lot and the enclosed cutting area is better from a health and safety and cleanliness perspective. We also like the handwheels on all the XYZ machines which allow us to move backwards and forwards through a program to prove it out. You can easily learn to program the ProtoTRAK in one day." This machine is used for larger batches of parts up to around 50 off needing drilling, boring and tapping saving a considerable amount of time on tool changing. Additionally, tool setting is easy with the touch probe the offsets are recorded in the control by pressing the ABS set button. The machine has 20 pockets and the company has 10-12 tools set at any one time leaving capacity for preparing tooling for new jobs. Accuracies required are ± 0.025 mm with holes to H7, well within the capabilities of the machine.

Like many companies, PJ Innovations is



conscious of the skills shortage, so has four apprentices undergoing training at the moment. James Goode concludes: "The XYZ machines are perfect for the apprentices. They have been to XYZ's training school in Nuneaton and the easy programming on ProtoTRAK and the hand wheels for prove out are quick to learn. We need to train our own skilled people to take the company forward and, as well as enabling more machining to be done in-house, XYZ is helping us to achieve these goals."

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Citizen Machinery UK extends international reach

Headquartered in Bushey, Hertfordshire, Citizen Machinery UK has long been responsible for the Japanese watch group's CNC bar-fed lathe sales in Britain and Ireland, while also being a distribution hub for sales of machines in France, Spain, Portugal, the Nordic Countries, the Middle East and Africa. Additionally, it works closely with subsidiaries in Italy and Germany. Underlining its international standing within the group, the UK subsidiary has spread its wings much further to join forces with a dealer in Australia, Headland Technology, based in Victoria.

Operating also from centres in Sydney, Perth and Brisbane, the company serves the Australian and New Zealand markets. It already represents 20 global brands covering machine tools, storage systems and metrology equipment. With around 75 highly skilled technical personnel in sales, applications and service, it is the perfect fit for Citizen Machinery. The independent technology consultant and equipment supplier focuses, in particular, on Industry 4.0 networked production and factory

automation solutions designed to improve the profitability of its high-profile customer base.

A Citizen Cincom L32-XIILFVR was delivered to the dealer and was exhibited on the Headland Technology stand at the Austech 2023 show in Melbourne in May. The top-specification sliding-head lathe has nine CNC axes, including a Y2 axis on the back tool post and +90/-45 degree B-axis swivel on the front gang tool post to enable angled holes to be drilled at either spindle. The model will also have low frequency vibration functionality for advanced chipbreaking of materials that normally generate stringy swarf.

Owen Gibbons, European sales manager at Citizen Machinery UK comments: "I am extremely proud to announce the newest addition to our ever-expanding dealer network, Headland Technology. It provides us with an exciting and unique opportunity to



A Cincom L32-XIILFVR sliding-head lathe is being supplied by Citizen Machinery UK to newly-appointed Australian dealer, Headland Technology

expand our international activities. Together with our end-users, we are looking forward to reaping the benefits of partnering with Headland Technology."

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A new dawn

One of the great names in British motorcycling is rising again under new ownership and with new state-of-the-art machining technology.

The Norton name is synonymous with the golden age of British motorcycling that ran from the end of the 19th century to the second decade of the 21st. It's a history that takes in Grand Prix wins in the 1930s to World Championships in the 1950s. It includes innovations like the featherbed frame and the world's first production 'superbike' that was unveiled at the 1967 Earls Court Motor Show.

Alas, the decline of British motorbike manufacturing led the company to the brink of bankruptcy and it was only the intervention of Indian motorbike manufacturing giant, TVS, that saved it in 2020. TVS is renowned for producing quality bikes at affordable prices, but the new owner's aim for Norton was very different and centred on making the brand its flagship, luxury line.

"TVS make three million bikes every year in their Indian facilities, so they know manufacturing and they know how to make a product that is so reliable they can offer a 30,000-mile warranty on a 100cc bike," says Adam Green, senior manufacturing process engineer at Norton Motorcycles.

"Norton is a very different proposition for them. Norton is premium brand for TVS and as an owner, they want flawless paintwork, flawless polishing, reliability, component testing, the lot. Our brief is simple, make the finest bikes Norton have ever made." TVS' plans for the brand have included the opening of a new manufacturing facility in Solihull, West Midlands, that aims to build British bikes using a combination of traditional hand-crafted ways of working with modern manufacturing techniques to deliver consistently high quality.



That willingness to embrace new ways of working led the company to critically examine how it made its bike frames in its fabricating facility. "Previously, we'd been hand-bending and hand-scalloping the bike frames because we didn't know how to do anything different," says Adam Green. "We could get the casts pre-machined but that would mean we had the welders controlling the tolerances. It's difficult to hold a tight dimension while the component is moving around with all the variances, from the skill of the welder to the time of year."

The TVS takeover gave Norton much greater access to technical input which was invaluable when the company began planning for potential new motorbikes.

Norton's commitment to only using the highest quality equipment led the company to Yamazaki Mazak. "We looked at various options, but we wanted to be seen to be investing in the best available machine," says Adam Green. "Mazak are the kind of people we want to be doing business with."

Norton specified a VTC 800/30SLR, manufactured in nearby Worcester, which has a high capacity working area and a wide door opening making it ideal for larger workpieces, such as motorbike frames.

Adam Green continues: "The size of the frame meant we needed a big machine, but also one that could work to very high tolerances. It's all about repeatability. The machine takes away manual process. Now every single dimension will be within 0.2 mm of each other. We've tightened tolerances up by 80 percent whereas



previously there was 6 mm of difference at times from one frame to another."

The new machine will be housed in a state-of-the-art production facility that is also home to the company's new global design and R&D hub. It forms a key part of Norton's strategic growth plan on its journey to becoming a leading player in luxury and high-performance motorcycles. At the heart of the new facility lie rigorous quality controls.

The Mazak has had an almost revolutionary effect on Norton's productivity and the company's ability to service bikes once they leave the factory. Adam Green concludes: "We've been able to massively take out production time. Previously with all the checking and adjusting we were really only able to make small numbers. With the Mazak and the pre-welding, we think we can do 30 per day and with more accuracy.

"The Mazak has transformed what we are doing but it's important we don't lose sight of our heritage and our traditions."

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Pioneering the next wave of manufacturing brilliance

In the world of CNC machine tools, the quest for precision, efficiency, speed and forward-thinking is never-ending. Specialising in large capacity machine tools, TDT also endeavours to bring the pinnacle of these advancements to the UK's manufacturing industry. It has now announced a big stride in that direction.

It is officially collaborating with the 'German machine tool group' (GMTG), a consortium of elite companies recognised globally for their expertise and innovation. GMTG comprises of prominent names such as CYTEC SYSTEMS, EDEL, DEPO, each of which has left an indelible mark in sectors like aerospace, toolmaking and power generation and the new introduction, DST, which is set to obliterate cycle times for high speed 6-axis machining.



DST

With a focus on advanced aerospace solutions, DST brings to the fold innovations that have consistently pushed the boundaries of what's possible in large aluminium aerostructure parts on the Ultraspeed with the most rigid and powerful Parallel Kinematic head (PKM) yet. DST is pushing boundaries, with 80 m/min rapids and unrivalled 9.81 m/s² acceleration in X,Y and Z.

EDEL

Synonymous with high-precision tooling and advanced machinery, Edel is a name trusted by aerospace giants. Its commitment to quality ensures that every component manufactured meets the rigorous standards of the aerospace sector.



DEPO

Renowned for its advanced milling and turning technologies, DEPO has been a cornerstone for companies in the power generation sector, ensuring that the energy backbone of nations is built on machinery that's both reliable and cutting-edge.

Unveiling new horizons for the UK market

By introducing GMTG's offerings, including the expertise of EDEL, DEPO and DST into the TDT portfolio, the company is not just adding machines but also integrating a legacy of excellence, innovation and expertise.

TDT invites its esteemed partners, patrons and UK manufacturing to discover the transformative capabilities GMTG and its companies offer. Contact TDT for more information on what EDEL, DEPO or DST can do for your machining strategies.

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Mills helps subcontractor to achieve rapid increase in turnover

Mills CNC has recently supplied Wordsley General Engineering Ltd, a precision subcontract specialist based in Stourbridge, West Midlands, with two new, large-capacity machines.

The machines, a DNM 750 II vertical machining centre and a Puma 4100LB horizontal lathe, were installed at the company's 2,400 sq ft. machine shop facility in May and July 2023, respectively and are the first DN Solutions' machines the company has acquired in its 14-year history.

Wordsley General Engineering is a small company with a young and dynamic workforce and a reputation for achieving and delivering engineering excellence. Adam



Tarbet, Wordsley General Engineering's owner and managing director, says: "We had recently appointed a highly-experienced machinist, in August 2022, who, in his previous employment, had worked on Doosan machines from Mills CNC and extolled the virtues of both.

The machine Mills CNC recommended to Wordsley General Engineering was a DN Solutions' DNM 750 II. The DNM 750 II is a large-capacity, 3-axis vertical machining centre equipped with a powerful, high-torque 15.6 kW/12,000 rpm Big Plus spindle, a 40-tool position ATC, a large worktable and the advanced Fanuc OiTP control with a 15" touchscreen iHMI. According to Adam Tarbet, the DNM 750 II, despite only recently being installed, has already had a dramatic impact on the company's turnover, increasing it by 30 percent in less than six months.

With such a positive experience of DN Solutions' machine tool technology, it was no surprise that Wordsley General Engineering approached Mills CNC when looking to improve its turning capabilities in June 2023.

"We contacted Mills CNC as we needed to increase our in-house turning capacity. We were looking at investing in a proven, heavy-duty lathe with a large turning diameter and turning length and, following in-depth discussions with Mills, we decided to invest in a new 15" chuck/116.5 bar capacity, box guideway Puma 4100LB."

The FANUC-controlled Puma 4100LB provides Wordsley General Engineering with a significant increase in its turning capacity and capabilities. The lathe has a maximum turning diameter of 550 mm and maximum turning length of 2,092 mm, and is equipped with a powerful, gear-box driven 26kW/2,000 rpm spindle, a servo-driven 10-station turret and a hydraulic manual tailstock.

Adam Tarbet concludes: "We are delighted with our two new DN Solutions' machines and with the service and support we have received from Mills CNC."

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Sodick machines drive efficiency and growth at Excel Precision

Since 2019, subcontract EDM specialist, Excel Precision Group, has taken delivery of eight Sodick machines from Sodi-Tech EDM, a mix of wire and spark-erosion models. The upshot? Linear growth averaging 22 percent a year, 57 percent less electricity consumption and a 50 percent reduction in carbon footprint.

Technical director Steve Batt outlines the company's reformative machine tool journey over the past four years: "Prior to investing in Sodick machines, we had seven older wire-erosion and seven older spark-erosion models," he explains. "The initial aim of replacing those machines was simply to reduce our consumption of electricity and EDM consumables."

After investing in its first two Sodick machines in 2019, Excel Precision learnt they performed as well as the sales literature set out, especially in terms of energy efficiency. This realisation soon led to the arrival of more Sodick machines, including two AG60L die-sink models.

"We went from seven EDM spark-erosion machines to three, reducing our power consumption by 57 percent," explains Steve Batt. "Moreover, despite reducing machine numbers, we actually managed to increase our production and turnover from die-sink work."

The resounding success of this project led the company to invest in three further machines, including Sodick's largest wire EDM, an AQ1200L model and ALC400P and ALC600P wire machines. Today, the company has eight Sodick EDM models across its three UK manufacturing facilities: five in Gloucester, two in Birmingham and one in Leeds. The Gloucester and Birmingham facilities are NADCAP-certified, which means they undertake Excel Precision's notable quantity of aerospace work.



"We produce a lot of fuel pump parts for aeroplanes and helicopters, typically made from 'S' grade high chromium-nickel stainless steels," says Steve Batt. "Some components are very small and undergo several spark-erosion operations, but the majority are wired."

Critical among the features of these fuel pump parts is the aperture, which carries a very tight tolerance to allow a specific flow of hydraulic oil. Any compromises in precision can compromise data feedback to the fuel system's computer, which constantly monitors hydraulic pressure and flow to ensure correct operation. The Birmingham facility of Excel Precision manufactures various fuel pump parts in batches of several hundred a month. Here, high-performance EDM machining is paramount.

"On the Sodick wire machines we're achieving better surface integrity in less cuts: two instead of three," states Steve Batt. "Our throughput speed is also significantly higher, perhaps up to 30 percent. These benefits, added to the aforementioned reduction in machine numbers and consumables, means the carbon footprint of our wire EDM department is now 50 percent smaller."

Looking back, Steve Batt admits that if Excel Precision hadn't made the transition to high-efficiency, high-performance Sodick EDM machines and instead continued with its 14 legacy machines, the recent spike in electricity prices would have likely seen the business struggle to move forward.

"Commencing this strategy in 2019 saved a lot of cost," he says. "We started out looking

to save money in electricity but obviously we didn't know that in 2022 our electric bills would increase in price fivefold! We had to make some incredibly difficult decisions in late 2022 to ensure the business could move forward on a solid footing, but switching to Sodick machines certainly helped us get through an incredibly difficult period in our company's history."

The company's gains from Sodick machines do not end there. Excel Precision also enjoys high machine reliability and flawless aftersales support, as Steve Batt confirms: "Sodi-Tech calibrates the Sodick machines at Gloucester and Birmingham as part of our annual NADCAP AC7116/3 rev B audit. The service is always impeccable."

Excel Precision currently has a strong order book, particularly on the aerospace side of the business, helping to drive average linear growth of 22 percent in the 10 years since 2013.

Steve Batt concludes: "Aerospace customers are interested in two factors: zero defects and on-time delivery. However, we can only provide that level of service if we have the experience, skill set and the best machines for the job. Going forward, as and when finances allow, we'll look at buying more Sodick machines to continue driving improvements across our business."

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'F' is for flexibility and functionality

GF Machining Solutions, the EDM, milling, laser and additive manufacturing machine tool manufacturer and a supplier of advanced automation, tooling and workholding systems, has introduced a new range of wire EDM machines into the market.

The AgieCharmilles CUT F series is comprised of two models, CUT F 350 and CUT F 600, each equipped with GF Machining Solutions' proprietary UNIQUA control, Intelligent Spark Protection System (ISPS), iWire intelligent functions and RFID Smart Wire system. At the heart of each machine is the proven high-end IPG-DPS generator.

CUT F machines deliver improved performance and optimised precision. The range sits in-between the company's already established CUT E and CUT P series' of wire EDM machines and features the tried, tested and trusted SparkTrack technology platform.

The new C-frame machines feature an enhanced design that improves thermal stability and vibration control resulting in higher part accuracies and superior surface finishes. Specific features include axis optical encoders that are cooled via the work tank and the dielectric fluid, and high-accuracy,

high-grade ballscrews that improve positional accuracies.

CUT F machines are supplied with a sophisticated and intuitive iHMI with a 19" vertical touch screen, a full keyboard and a mouse. The UNIQUA platform interface supports offline and at-the-machine programming and facilitates sequential and object-oriented programming. The control is equipped with a powerful graphic tool with an integrated CAM system and is compatible with major CAD/CAM programs.

The iWire function automatically identifies and adapts the wire speed to changing erosion height conditions during the wire EDM process and, by doing so, eliminates wire breakage while reducing overall wire consumption per job, in some instances by as much as 29 percent.

iWire technology works in tandem with ISPS, both of which are accessed from the UNIQUA control.

iWire functionality recognises where sparks are occurring in the process and identifies and measures the position of each spark along the length of the EDM wire. Knowing the precise location of a spark



allows iWire to automatically adapt the wire spool feed rate. This is especially important during lights-out, unattended operations and when machining stepped parts.

The RFID Smart wire spool technology stores wire characteristics as well as other traceability-related data. CUT F machines deliver high precision, fast processing speeds and improved process control.

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Mitsubishi gives spark of productivity at MJ Toolmakers

As a specialist toolmaking business that works with clients from concept through to manufacture, MJ Toolmakers Ltd has gone from strength to strength since the business was founded in 1995. Producing everything from mould tools, injection mould tooling, aluminium and zinc cast tooling and extrusion die tooling, the Market Harborough company is witnessing an ongoing period of sustained growth. It is the continuous upturn in business that has seen the company acquire two Mitsubishi EDM machines from the Engineering Technology Group (ETG).

As an established manufacturer with a range of manual and CNC machine tools on the shop floor, MJ Toolmakers was witnessing capacity issues in its EDM department which consisted of four machines. In addition, MJ Toolmakers has a stringent policy to replace machine tools after five years of operation. This means that the 11-employee business is always running the most up-to-date technology available.

With a mixture of wire and spark erosion technology, the company undertook a full review of the marketplace and it took



delivery of Mitsubishi MV1200S wire erosion machine in January 2023. This machine was rapidly followed by Mitsubishi SG8S die-sinking machine in March 2023. With no prior experience with Mitsubishi machine tools or working with ETG, MJ Toolmakers director Nathan McDermott says: "We reviewed the entire marketplace and ETG offered us the best machine with the best performance at a cost-to-performance ratio that met our needs. Additionally, the large work area of the Mitsubishi MV1200S with an extremely small footprint was a very attractive proposition for our workshop."

Since the machine was installed in January, it has been running around the clock. As Nathan McDermott continues: "The MV1200S is running at least 85 percent of the time. As a business, we run 24/7 with lights out machining and the Mitsubishi MV1200S has been running non-stop since we bought it and it is running at approximately six times faster than our previous EDM machine."

In comparison to the previous machine, the Mitsubishi MV1200S provides several benefits. Inevitably the ageing machine that was replaced incurred service issues while the power and consumable costs were higher than on the Mitsubishi MV1200S. This is because the Mitsubishi MV1200S incorporates next-generation drive systems and an optimum machine structure with linear shaft motors that help to improve surface finishes and productivity rates and also prolong wire life.

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Does Gen Z hold the key to solving the UK's productivity puzzle?

Digitally native and open to technological progress, Gen Z could be the secret weapon the manufacturing sector needs to harness the power of automation. But it is incumbent on the industry to make sure the younger generation is turned on to careers in engineering and robotics. Here, we reveal the steps FANUC UK is taking to capture the attention of these bright young minds in a bid to secure the future of UK manufacturing.

Despite our reputation as a strong manufacturing nation, productivity has long been the Achilles' heel of the UK's economy. Although we are now the eighth largest manufacturing nation, international comparisons show that the USA and Germany produce about one-sixth more than the UK per hour worked. Looking beyond the economy-wide picture, while productivity is an issue for all industries, it is an ongoing struggle for our manufacturing sector. Productivity levels have essentially flatlined since the pandemic, with ONS data revealing that in the first quarter of 2023, manufacturing actually made a negative contribution to productivity growth.

Automate to accelerate

It is therefore no coincidence that the UK also lags behind other industrialised nations in its uptake of automation. According to the International Federation of Robotics' 2022 report, robot density in the UK manufacturing industry was 111 robots per 10,000 employees in 2021, placing us 24th in the world robot density rankings and the only G7 country to sit outside the top 20.

With a clear correlation between investment in automation and higher productivity rates, the obvious way for the UK manufacturing sector to break this vicious cycle is by automating to lift performance. One of the key obstacles to increased uptake of automation is the well-publicised industry skills shortage, which is being exacerbated by an ageing workforce. According to ONS data, almost one fifth of all workers in the UK manufacturing industry is aged 55 or over. Ultimately, the industry needs to attract a new influx of people who can design, build, install, operate, programme, maintain, fix and advance robots and other automation



technologies and successfully integrate them into manufacturing facilities across the country.

Why Gen Z?

Fortunately, a solution is staring the industry in the face in the form of Gen Z; the generation of digital natives born between the late 1990s and early 2010s. The high-level skills that UK manufacturing firms need to remain competitive are changing and Gen Zs are perfectly placed to bridge that gap. This is a group of people that is plugged in. They have grown up with the internet and have used smartphones ever since they became old enough to own one. Lacking any fear of technology, they want to work smarter, not harder.

Another trait of Gen Z is their ability to adapt quickly. They are learners by nature because the technology they interact with is changing all the time. For employers, having a workforce that is ready to embrace new technology can be incredibly valuable.

Changing perceptions

So, what can manufacturing companies already struggling with skilled and unskilled labour shortages and facing competition for younger staff from tech and finance firms do to ensure this cohort is switched onto a career in automation and engineering?

23-year old Hara Konstantelia is a technical sales support engineer at FANUC UK. She believes one of the problems is that automation, as a career path and industry, is not really represented in the world that Gen Zs inhabit. She explains: "You don't often see robotics in movies, on social media or on TikTok, which is where young people hang out and learn about the outside world," she says. Hara Konstantelia agrees that this can potentially fuel outdated perceptions of manufacturing as an 'oil and rag' industry, mainly because young people "don't know what it involves". The reality is of course quite different. Today's engineers are just as likely to need coding and programming skills as well as more traditional expertise typically seen in the industry such as welding.



Encouraging healthy competition

To help dispel these myths and showcase the reality of a career in automation, FANUC UK is at the forefront of a number of initiatives to

develop a new pipeline of Gen Z talent. One of these is the WorldSkills Industrial Robotics competition, a trail-blazing industry-education initiative. Working in teams of two, participants, aged 16+, are taught how to programme and operate real-life robots, before putting their skills to the test. Five teams made it through to the Industrial Robotics National Final, which took place at FANUC's UK headquarters in Coventry as part of its Open House event this month.

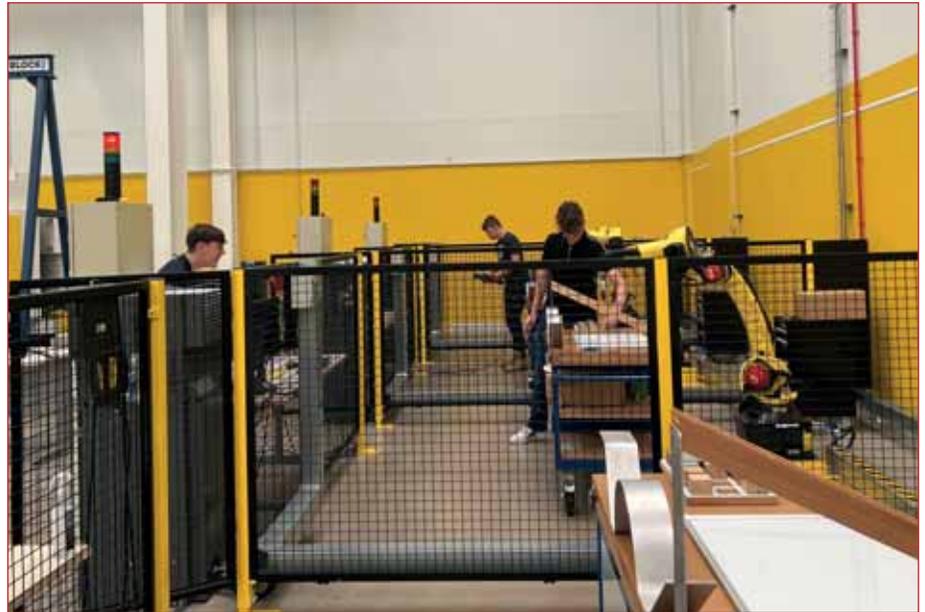
"As a company, we are really keen to engage with young people and enthuse them about robotics engineering as a career choice. The WorldSkills Industrial Robotics competition is all about making robotics accessible, relevant and appealing to young people," says Oliver Selby, head of UK sales at FANUC UK.

Hara Konstantelia competed in the WorldSkills UK Industrial Robotics competition in 2019 and this year was involved with the judging. She explains: "Having seen both sides, I believe it's a great way of getting young people into robotics engineering by showing them what projects involve and what programming is. It teaches industry-level skills that are a really useful preparation for a career in automation."

The making of a modern apprentice

Hara Konstantelia's own route into the industry was through an apprenticeship with the Manufacturing Technology Centre (MTC), which led to a work placement and ultimately a job at FANUC. An apprenticeship provided the perfect mix of theory and practical application and gave her the opportunity to immerse herself in the industry. She continues: "You can't really know what a job in the automation industry involves until you do it. I think learning on the job is one of the best things you can do."

This view is echoed by current FANUC UK apprentice, Jack Leonard. He says: "My particular role is centred around the



installation and setup of robotics systems, but there are also lots of digital-focused tasks, from programming the robots, to electrical controls work, to design and robot simulation software," he says. "As soon as I saw the role at FANUC, I knew that's what I wanted to do. I liked the sound of learning both theory and practical skills and being an apprentice boosts your early career. By the time others finish their academic courses, I'll have years of work experience, as well as qualifications. It's hard to get that kind of experience so early in your career without an apprenticeship."

Prioritising practical experience

It is clear then that one of the ways to attract Gen Z into the industry lies in providing practical training opportunities in real-life engineering settings. Historically, this is an area that has been woefully neglected particularly in the provision of post-GCSE technical education. Here, FANUC is making a real difference by supporting automation education at lower foundation level.

The company's Training Academy at its Coventry HQ has recently achieved independent validation, which allows FANUC UK to offer accredited courses that can feed into mainstream education. Students will gain valuable hands-on experience in areas such as operating, programming, troubleshooting and integrating robots while securing credits towards their qualifications. This industry-led methodology will greatly benefit the new T-Level awards, which have



been designed to try and solve the ever-growing skills gap conundrum.

This summer also saw the company host its first ever Work Experience Week, which aimed to give young people aged 16-18 a practical insight into the world of automation.

Oliver Selby concludes: "We firmly believe that this type of close, mutually beneficial cooperation between industry and education will be the key to the success of the new T-Level system and is precisely the direct intervention we need to attract younger people to manufacturing. There is a great opportunity for the robotics and advanced manufacturing sector to change the perception of manufacturing. Embracing automation and the development of an engaged and empowered Gen Z workforce is a key part of this puzzle."

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Tezmaksan launches new CubeBOX systems at EMO Hannover

New technologies for machine loading and unloading

At EMO Hannover, Tezmaksan, a leading European manufacturer of robotics and automation, launched three new iterations of its innovative CubeBOX system. CubeBOX is a revolutionary series of automation solutions that enable operator-free production in machine tending.

Developed by Tezmaksan, the CubeBOX systems integrate with any control unit and any robot of the user's choice regardless of manufacturer or communication protocol and can support the automated loading and unloading of CNC machines.

Among the launches at EMO was the CubeBOX Pallet Pool, also referred to as Pallet Tower and Pallet Changer. The system is used for automation of CNC machining centres with limited floor space and can manage up to 24 pallets and 16 tools with just one unit. Pallets are arranged in a compact circle in front of the machine, using a 6-axis robot to load and unload into the system. The equipment significantly reduces reliance on operators for loading and unloading and can enable up to 24-hour operator-free operation.

Other demonstrations include the CubeBOX RT Stacker (RT-S). The RT-S is suitable for lathes and vertical machining centres. The system uses two pallets for part loading and can tend one or two CNC machines. A key advantage of this model is the ability to stack two pallets on top of each other, enabling higher throughput without an increased factory footprint.

Lastly, Tezmaksan demonstrated the CubeBOX Space Cabinet. This model boasts three drawers for holding product which is unloaded using a 6-axis robot. Using this system, an operator does not have to regularly restock the system. When restocking is necessary, the CubeBOX Space Cabinet's ergonomic design allows drawers to be rolled into a reachable position for easy parts supply.

"Automating the loading and unloading of CNC machines can have significant financial, efficiency and productivity rewards," explains Hakan Aydogdu, general manager at Tezmaksan. "CNC machining requires high precision and accuracy and improper loading



and unloading can result in misalignment or damage to the workpiece and that is not to mention the time dedication required for physically handling parts.

"Another consideration is operator skill and availability," Hakan Aydogdu adds. "CNC machines are designed for continuous operation, so minimising downtime by reducing operator reliance is crucial."

Impressively, the CubeBOX can increase night shift productivity by up to 50 percent, enabling an average return on investment of just eight months.

All CubeBOX systems lean on RoboCAM smart automation software from Tezmaksan. RoboCAM allows operators to integrate CubeBOX with any accompanying robot with no prior robot programming knowledge required. An operator simply uploads product drawings and RoboCAM translates these into a language the robot can understand and action.

"RoboCAM and CubeBOX are essential technologies for the flexible and serial

production system model, an engineering style that Tezmaksan has pioneered for several decades," Hakan Aydogdu concludes.

For more information on CubeBOX automation systems, including the CubeBOX RT-S, Space Cabinet and Pallet Pool, visit the Tezmaksan Robotics website.

Tezmaksan is a European robotics, machine tools and industrial equipment company that dates back to 1969. Tezmaksan manufactures in-house in Europe and distributes its offerings such as CNC machines, machining centres, lathes, milling machines and more. Tezmaksan headquarters in Istanbul and has a strong presence in the European market.



Tezmaksan delivers cutting-edge solutions, training and support services for industrial and commercial applications.

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ABB expands GoFa cobot family

ABB has launched two new variants of its GoFa™ collaborative robot. The GoFa 10 and GoFa 12 offer new possibilities for companies to leverage cobot automation for enhanced efficiency. Handling payloads of up to 10 and 12 kgs with leading repeatability, the cobots can handle an expanded range of tasks in close collaboration with workers, addressing skills and labour shortages while improving safety and productivity. Offering straightforward programming and rapid integration into production environments, the new variants lower barriers to entry for first-time users, educators and SMEs.

“Since we launched our YuMi cobot in 2015, we have built an industry-leading cobot portfolio meeting growing demand for safe and easy-to-use automation solutions to plug gaps in skilled labour,” says Marc Segura president of ABB Robotics. “Addressing the need for collaborative robots with higher payloads and longer reach, our GoFa 10 and 12 cobots extend the benefits of automation to new industrial applications, even for first time users.”

In addition to their enhanced payloads, the GoFa 10 and 12 cobots offer class-beating Tool Centre Point (TCP) speeds of up to two metres per second with 0.02-mm of deviation for greater repeatability, a two-fold improvement over comparable solutions. IP67-certified against moisture and dust ingress, they extend the benefits of fast and accurate collaborative robotics to new industrial applications, automating demanding tasks such as machine tending, welding, parts handling, polishing, and assembly. The GoFa 10’s 1.62 metre reach, 14 percent more than others in its class and enough to cover US pallets, makes it ideal for palletising applications.

Lowering barriers to automation for first-time users and SMEs

The GoFa 10 and 12 cobots are straightforward to program, deploy and use, lowering barriers to automation for first-time users and SMEs. Setup is made easy with lead-through programming and ABB’s Wizard easy programming software, allowing even



non-specialists to quickly automate their applications by manipulating simple graphical command blocks rather than writing complex programming code.

Pre-installed on the cobots’ ABB’s FlexPendant robot controller, the ABB SafeMove app features safe speed limits, standstill monitoring and orientation supervision, enabling close collaboration between robots and factory workers without requiring bulky protective barriers or fencing.

The GoFa 10 and GoFa 12 cobots are powered by ABB’s OmniCore™ controller.

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Innovative automation solutions

Highly economical production systems are produced through the combination of a productive complete machining centre and a smart automation solution. WFL subsidiary FRAI Robotic Technologies is an innovative automation partner that develops highly flexible robot systems.

Autonomous production methods have long been used by automotive manufacturers, the aerospace industry and mould construction companies to produce equipment for machine tools. Other sectors with less of a focus on automation are now showing increased interest in this area, above all due to the possibility of introducing autonomous night and weekend shifts. Depending on the customer's requirements, WFL and FRAI use automation solutions such as articulated robots, automated linear and area gantries and even mobile robots for automated workpiece loading. Peripheral transport and storage systems for workpieces, tools and clamping devices can be integrated as required.

WFL subsidiary FRAI Robotic Technologies is the perfect partner, from initial concept development of an automated system to implementation and setup, right through to system maintenance. The range of gantry loaders and robotic cells makes it possible to offer comprehensive automation concepts with maximum customer benefits and to the highest quality standard. This brings some key benefits for the user, such as continuous productivity with minimal operating effort, in particular when it comes to repeat orders. However, robots are not only used in large-scale series production; there are also many advantages to automation for small batch sizes, when used in combination with easy-to-program software. Customer-specific options, such as unloading samples, inscribing, cleaning, measuring blank parts and even additional processing tasks performed by the robot.

The ever-greater variety of models has meant that transfer lines have tended to be replaced by flexible line chains or by individual cells with a variable material flow. Using intelligent software in combination with the relevant automation solutions, not only enables workpieces to be loaded and unloaded but also means that machining centres can be set up fully automatically through the automatic replacement of tools and clamping devices. In addition to the classic handling solutions, WFL turnkey



One of the most flexible automation versions of machine tools or processes is the articulated robot in a robot cell

projects are often fitted with a higher-level host computer system. This 'brain' takes over the entire logic and logistics from within the fully self-sufficient, flexible production cell. In addition to workpiece measurement and tool management, Operational Data Acquisition (ODA) data is also transferred to the customer's Manufacturing Execution System (MES).

Robot systems can also link up multiple machining centres

An automation solution implemented by WFL and FRAI has been specially developed for flexible batch production and is designed for the automation of four machine tools for handling different shafts. The 6-axis robot with 500 kg payload is mounted on a seventh axis. An automatic gripper exchange system has also been attached so that a wide variety of grippers can be connected and disconnected fully automatically as required when the system is operating in automatic mode. An integrated drip tray collects cooling lubricant and chips. Automatic changeover of jaws, tailstock tips and prismatic tools in conjunction with a servomotor gripper for covering an extremely large product range allows for set-up-free operation of the machines and automation solution.

mobileCELL is a hybrid solution, which impresses with its combination of wide-ranging functions and advantages. There was a time when the classic robot cell could only load and unload workpieces. This basic function was then enhanced with gripper exchange systems. Due to the significant disadvantages of a location-bound



Customers are increasingly looking for holistic solutions. The mobile robot solution, mobileCELL makes companies more competitive

robot cell and the costs for intralogistics tasks, a solution was discussed which would produce benefits for the customer. mobileCELL consists of an appropriately large Automatic Guided Vehicle (AGV) with a robot cell construction: the robot, workpiece and tool gripper, along with buffer positions for workpieces and tools and the necessary control and safety technology. The machine moves completely freely, it is not blocked or obstructed. The AGV collects the required tools and workpieces in the warehouse, it then travels to the front of the machine, locks itself in place on the floor and exchanges parts and/or tools. The vehicle then moves away again and receives the travel instructions for the next machine. The space in front of the machine it has just loaded becomes clear again.

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Compact and powerful, energy-saving palletising robots

Where an EOL-packaging, distribution, or other similar application requires powerful all-round high-performance palletising robots, the Motoman PL series is the ideal solution. Available from robotics and motion control specialists YASKAWA, these robots offer excellent speed-payload combinations, stacking heights and simple installation.

Motoman PL robots include newly tuned kinematics and the latest generation of Sigma7 drive technology which help to improve stability, increase payloads and cycle times. This optimises the performance of these versatile, all-round robots, which are ideal for automatic palletising and de-palletising applications.

The PL range comprises six models with a payload range between 80 kg and 800 kg and so cover an extremely broad spectrum of high-performance palletising tasks including classic final packaging applications which are becoming increasingly automated in today's manufacturing and distribution logistics.

Thanks to their compact design and small footprint, Motoman palletising robots ensure optimum use of space for the setup of compact palletising cells. Media cables for

grippers can be connected, protected and are collision-free as they are fed through the robot base and inside the arm through all axes and also the hollow wrist.

All the models in the Motoman PL range work together with the compact, high-performance YRC1000 controller that incorporates a wide range of functions for path planning and communication. The controller used on the medium to larger robots also features an innovative power regeneration function which enables energy to be generated when the motor is decelerated and has proven to reduce energy consumption by up to 30 percent.

The controller also synchronises the movements of function grippers or tracks while an optional Functional Safety Unit (FSU) provides an ideal performance combination as it safeguards and minimises the most compact workspaces.

The integral MotoLogix interface enables PLC system programmers to program these robots in their customary IEC61131 conformant PLC programming environment. Another important benefit of this interface is it removes the need for a dedicated robot



programmer and also integration into the PLC controller is greatly simplified.

The MotoSim VRC simulation software allows for easy design, planning and simulation of palletising cells. With a self-explanatory user interface, Yaskawa's optional PalletSolver palletising software simplifies programming of pick-up and depositing patterns as well as layer patterns which ensures numerous application specific features such as mixed palletising or multi-grippers.

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www.Yaskawa.co.uk

Erodex celebrate 50th anniversary with £400k automation investment

The Erodex Group is celebrating 50 years in business by investing £400,000 in automation at its state-of-the-art graphite machining facility in the West Midlands.

2023 marks 50 years in business for the family-owned firm, who are looking to the future with the purchase of an automated pallet loading system to work in coordination with existing high speed machining centres.

As a result of the investment, the company expects to maximise efficiencies and output within a high-volume area of the business; creating capacity without the need to layer in additional shift patterns.

In addition, the alignment of existing machining capacity with automation provides Erodex with a portfolio that it has previously been unable to offer customers, therefore creating new business opportunities.

The company's state of the art machining facility in Wednesbury has been established for over 35 years, enabling Erodex to machine its wide variety of graphite grades into highly

complex components for a range of industries. It has also been a key driver in the significant growth that the Erodex Group has experienced in recent years, following a £1.75million investment in new machinery in 2021.

Steve Rolinson, director at Erodex Group, comments: "We are very proud to celebrate 50 years in business, which is a significant milestone for the Erodex Group.

"The fact that we continue to go from strength to strength as a business is testament to the fantastic, loyal workforce that we have here, many of whom have been with us for a significant amount of time.

"Further investment in our machining facility represents the next stage of evolution for the business. Since the mid-1980s the Erodex Group has enabled our customers to benefit from the capabilities of our ISO 9001 accredited graphite machining facility, which is widely regarded as the best graphite machining facility in Europe.



"Continued planned investment as part of our continuous improvement programme, including that in automation, means that we are well placed to capitalise on market opportunities moving forward and further reinforces our position as UK leaders in the design and manufacture of graphite electrodes, tooling and fixtures for the aerospace and IGT sectors."

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www.erodex.com

From the shed to the sky

The story of Ritchie Engineering Solutions and its partnership with CERATIZIT

Ritchie Engineering Solutions, based in North Essex, is a family business which prides itself on bespoke engineering product design and manufacturing quality items. Run by brothers Duncan Ritchie and Alasdair Ritchie, the company has a strong ethos for precision engineering which feeds into everything they design and produce.

A concept-to-cart company which now produces parts for motorsport, automotive and aerospace industries, Ritchie Engineering Solutions came from humble beginnings. Back in the 1980s, Duncan and Alasdair's father left his full-time job to follow his passion: producing steam launch engines. From the shed in the back garden, Ritchie worked alongside one other employee John Riffel, to build his business. During this time of manufacturing steam engines and steam plant, Ritchie's thermodynamic and mechanical engineering expertise lead him to be invited to work on Richard Branson's hot air balloon in the mid-1980s. Ritchie was tasked to produce the high-altitude propane burners and capsule pressurisation equipment, which would fly the balloon from the US to the UK. It was a world first. The balloon successfully completed its journey thanks to the work and innovation of craftsmen and engineers throughout the country, including Ritchie.

After the passing of his father, Duncan and Alasdair decided to carry on the legacy of Ritchie Engineering Solutions. Still running from the shed in his mother's garden, they managed to squeeze in a CNC Lathe and 4-axis CNC mill and from this business began to steadily grow. Alasdair Ritchie, who had in the meantime completed a degree in engineering design, left his full-time job to team up with Duncan eight years ago and since then the brothers have built up Ritchie Engineering into a successful business. Moving on from their mother's shed, the brothers now have premises in North Essex where they currently have nine dedicated employees and have invested more than £1.2m in the company.

On the road to becoming what is now a much larger operation, Ritchie Engineering Solutions made contact with CERATIZIT UK for guidance with machine inserts and tooling. Adam Cross, technical sales engineer for CERATIZIT UK, first started visiting Ritchie



Engineering in 2015. Having first started visiting Ritchie Engineering Solutions in the days where they were still based in a shed, Adam Cross has been a constant source of technical support to the brothers.

Once Ritchie Engineering Solutions moved to its new premises and invested in more machines, Adam Cross helped the company to solve problems as they arose and worked with the engineers to optimise their processes in order to make profit from what they were producing.

Adam Cross visits Ritchie Engineering Solutions on a regular basis and has a constant line of communication with the brothers. Aside from his support, CERATIZIT's tooling has had a huge impact on the costs and operations in the workshop. On the Matsuura machine, which is running 24/7 in the workshop, CERATIZIT's inserts have more than doubled the tool life than the ones which were previously used, which has equated to a considerable saving in tooling costs. The MaxiMill SX indexable Parting Off tool has been a standout product for the

company, as the reliability of this part has meant that they have been able to run more single operation jobs and conduct more lights out running. This has allowed products to be manufactured much quicker and with considerably less scrap from damaged parts.

Alasdair and Duncan Ritchie are looking to the future of Ritchie Engineering Solutions optimistically and are excited to see what is in store for the company in the coming years. Duncan Ritchie says: "We are excited to see what's to come for Ritchie. The constantly evolving tool range from CERATIZIT means that we can improve our processes as and when appropriate tools and associated cutting strategies are recommended to us."

While the company is now working towards achieving more accreditations in aerospace, more of its bespoke designs are bound to be in the skies in the coming years.

CERATIZIT UK & IRELAND Ltd
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Email: info.uk@ceratizit.com
www.ceratizit.com

Full fine boring line from ITC

The expansion of the leading BIG KAISER bore machining technology that is available in the UK from Industrial Tooling Corporation (ITC) has now been extended once again. The new EWA 68 intelligent fully automatic fine boring tool recently received its world premiere at the EMO Hannover exhibition.



The new EWA 68 which is available in the UK this autumn from Tamworth-based ITC, is an intelligent fully automatic fine boring tool that performs closed-loop boring operations without human intervention. With the EWA 68, there is no need to stop the machine tool to take measurements and manually adjust the boring tool. This significantly reduces cycle times, increases productivity and reduces failure rates due to human error. It also reduces costs and improves accuracy. Furthermore, the system enables the handling of multiple bore sizes and repeatable bores and it avoids time-consuming manual wear-out compensation.

At EMO 2023, ITC engineers were on the BIG KAISER exhibition stand to demonstrate the full range of high-precision systems, including the new EWA 68 that was being showcased on a FANUC CNC machine. The EWA 68 is available with three different insert holders that support a wide range of diameters from 68 mm to 134 mm delivering an astounding adjustment precision of just $\pm 2 \mu\text{m}$.

“The EWA 68 is the latest version of our extensive EWA system, which provides automation at a level far above any competitor product. This saves significant time and money for our customers,” says Giampaolo Roccatello, chief sales and marketing officer for Europe at BIG KAISER. Developed by BIG KAISER and available to precision manufacturers in the UK from ITC, the EWA system is based on BIG KAISER’s EWE digital fine boring heads and the EWN precision boring heads.

For further information on the EWA 68, please contact ITC at www.itc-ltd.co.uk

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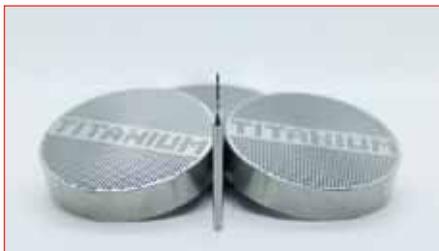
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New CrazyDrill Cool Titanium series from Mikron Tool

Mikron Tool presented the new CrazyDrill Cool Titanium ATC/PTC series at EMO 2023, which ensures maximum process reliability when drilling pure titanium and its alloys. The high-performance material titanium poses a chip removing machining challenge. Also, not all titanium is alike. Depending on whether it is pure titanium or alloyed titanium, the chip removing process behaviour differs. For these challenges, Mikron Tool has developed drills perfectly tailored to the respective titanium grades, which can machine titanium safely, with higher cutting performance results, longer tool lives and excellent hole quality.

Titanium is highly demanding

Machining the unruly titanium is highly demanding. One of the reasons is the combination of its properties of high elasticity and tensile strength. Because of the high toughness, chip breaking is difficult to realise. Due to its low thermal conductivity, heat is not dissipated from the cutting area through the chip. In addition, titanium tends to form built-up edges. This all leads to higher wear and reduces process reliability during drilling.



When drilling, the challenge is even greater

Drilling in titanium is much more challenging than milling. The viscoelastic property of titanium causes the drill to stick to the pressure on the cutting edges increases. This usually leads to uncontrolled drill breakage. Material sticking on cutting edges and guide chamfers increase cutting forces, as a result of which the cutting edges can break out. Moreover, the chip shape is also problematic. This is because the titanium chips tend to compact in the head area and prevent further chips from flowing in. The high temperature load on the cutting edges is an additional complicating factor.



Cool the tool

To reduce the heat in the cutting area, the cooling lubricant must reach the machining area directly. The two cooling channels with very large cross-sections carry massive amounts of coolant to the drill tip and guarantee constant cooling including lubrication of the cutting edges. At the same time, the massive coolant jet flushes the chips through the polished flutes and prevents chip jams.



The patented special shape of Mikron Tool's cooling channels enables a four times higher volume of coolant to be shot through the tool at the same pressure. This is a further key to success and stands for innovation in the thermal dissipation and chip removal technology.

Not all titanium is alike

To process this material efficiently, it is necessary to know it down to the smallest detail. Mikron Tool has examined various test materials and discovered that the different grades of titanium are extremely different from each other, which is of utmost relevance for their industrial machining. Pure titanium, grades 1-4, is characterised by high corrosion resistance, but has lower mechanical strength. Alloyed titanium, grade 5 and higher, has high strength but low ductility. Getting to grips with these differences in terms of machining technology is a master stroke. Thanks to the meticulous development work and the knowledge gained from it, the Mikron Tool engineers found, as of today, the perfect solution: two specific geometries, one for pure titanium

grades and one for titanium alloys. In this way, perfectly controlled chip removal, high drilling speeds, long tool lives and repeatable processes with optimum drilling quality for these difficult titanium materials are guaranteed.

The new CrazyDrill Cool Titanium is twice as fast

The new CrazyDrill Cool Titanium series is offered in the diameter range of .039" – 1/4", 1-6.35 mm. For pure titanium, Mikron Tool developed short drills with 3 x d and drills with 6 x d. For titanium alloys, Mikron Tool relies on drills with 6 x d and 10 x d in combination with a pilot drill.



For the cost-effective production of titanium components, tools are required which are specially adapted to the material properties of the various titanium grades. Titanium material as well as the workpiece are expensive, which is why high process reliability and calculable tool life are so important. If the latter can be improved, so much the better. Mikron Tool's new high-performance drills for titanium have up to three times longer tool life and work with twice the feed than current competitors.

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New tool system for milling light materials

For its patented M409 tangential milling system, tooling manufacturer Horn has introduced new rhombic indexable inserts with polished rake faces to enable efficient machining of non-ferrous metals in the ISO N material group, principally aluminium alloys. High quality is achieved on the surface of machined components, despite the ductility and adhesive nature of the workpiece material, which tends to cause built-up edges as well as cracking and wear of the cutting edge.

Positive radial and axial rake angles as well as a flank chamfer ensure a stable wedge angle for particularly smooth milling. The system delivers high metal removal rates, even when using less powerful machining centres or when the tool is deployed in a live turret in a lathe. The insert's extreme sharpness also lends itself to the machining of plastics.

The tangential milling range covers a wide variety of applications, delivering notable increases in performance and flexibility, especially with an internal coolant supply. Horn offers from stock the indexable inserts with polished rake faces on all four edges. In conjunction with positive chip breaker geometry, the sharp ground cutting edge produces a soft cut. The inserts can be used in all cutter body variants.

Horn Cutting Tools Ltd. Ringwood, is the wholly owned UK subsidiary of Horn S.A. Luxemburg, a leading European supplier of grooving tools and a leader in precision grooving technology. The company was incorporated in the UK in 2008, having previously traded as Horn UK since 1995.



Horn's M409 tangential milling system is now offered from stock with rhombic indexable inserts that have been polished on their rake faces, ideal for cutting aluminium alloys and plastics

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MEGA-Deep-Drill-Steel Tip for depth

With the MEGA-Deep-Drill-Steel, MAPAL showcased the new standard for deep drilling at EMO in September. It has been specially designed for machining steel and cast iron.

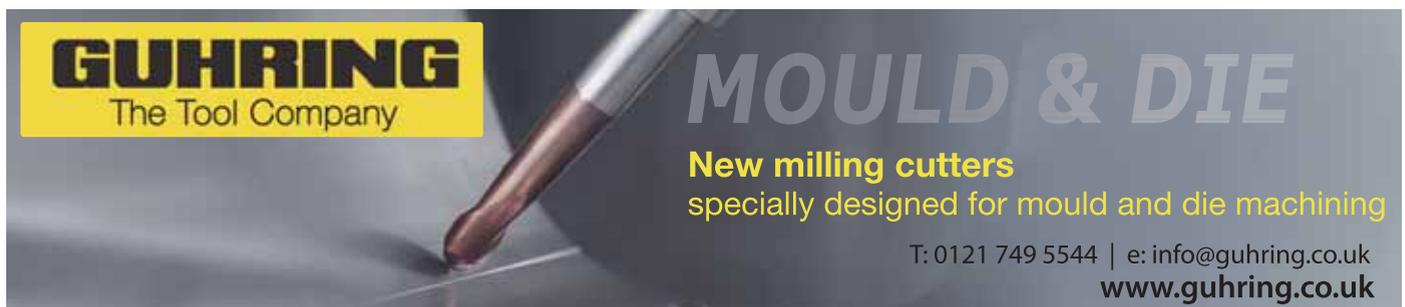
The solid carbide deep drills are optimally protected with an innovative coating with HiPIMS technology in the cutting-edge area. The head coating also ensures frictionless chip removal and is therefore the prerequisite for the reliable production of deep bores. The remaining length of the MEGA-Deep-Drill-Steel remains uncoated. "In our opinion, there is nothing smoother than a polished solid carbide surface," says Michael Villwock, product manager for solid carbide tools.

Spherical cutting edges provide a high level of stability and thus ensure a long tool life and high level of productivity. The point angles were selected so that the deep drills always start the cut with the chisel in the pilot bore. The standard range available from stock includes length ratios of 15 xD to 40 xD and the diameter range from 3 mm to 16 mm, with the long designs up to 9 mm. Adapted pilot drills are available for difficult drilling conditions.

With the MEGA-Deep-Drill-Steel, deep drilling is possible without pecking cycles at very high feed rates. The tools are suitable both for use with internal cooling and for minimum quantity lubrication, which has a positive effect on the tool life in steel machining. Field tests have shown that the new deep drills from MAPAL meet the highest requirements for tool life and performance even with demanding materials. Compared to its predecessors, up to 50 percent higher feed rates can be achieved.



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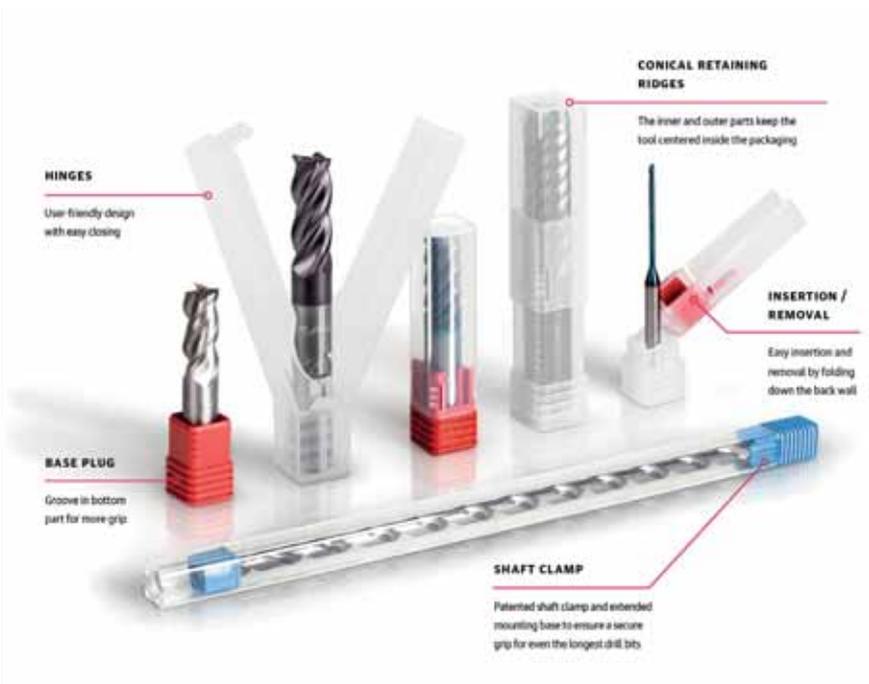
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Electrical clamping enables new concepts to get more spindle hours

Many companies, especially in the western world, are lacking experienced machinists. Some are struggling even to find people to load the workpieces into machining centres.

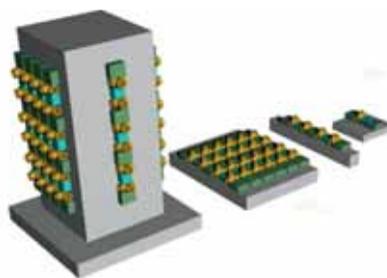
No wonder that automation in the machining industry is growing fast. The main goal is normally having more spindle hours resulting in better utilisation for the machining centres. As machining centres themselves are already robots by some definitions, the implementation of industrial robots for workpiece loading is actually a small technological step for the machining industry. More challenging has been to change the existing processes and find optimised peripheral devices for robots like grippers, feeders and fixtures.

When automatic feeding of the raw material into the machining centre is being considered, two main alternatives typically arise: Pallet handling and part handling. There has been significant developments in this field, by major robotic integrators and also by many innovative startups.

In pallet handling systems workpieces are loaded manually into a fixture, which can be anything from a plate for a single workpiece to huge tooling columns full of workpieces. In a typical Horizontal Machining Centre (HMC) there is a buffer of one tooling column only. The need to have more buffers has led to pallet pools and finally to full-scale FMS systems, where the buffer size can be hundreds of pallets. In pallet-handling type systems the workpieces are stored in the buffer clamped each in their own fixtures. To separate these pallets from transport pallets, they are called machining pallets. This is because actual machining will be done while a workpiece is clamped into a fixture on a pallet.

Various machining pallet types

The other approach is part handling systems, where the raw material buffer is typically on Euro pallets and an automated fixture is needed in the machining centre. In automated clamping, hydraulic clamping has been the mainstream technology until now. To sum up the main differences in these two alternatives, in part handling systems the raw material buffer is simpler but fixturing needs to be automated. Also, when a workpiece is



changed, the feeder, robot gripper and fixture need to either be set up for the new workpiece or changed.

Electrical clamping

OK-VISE is now entering into the automation business with electrical clamping. The pilots have been running in Scandinavia and one of the first installations has been running successfully since 2021. One of the many triggers to start the development of electrical clamping was the challenging power coupling and decoupling in hydraulic systems. Even with only two pallets in a pallet changer in a horizontal machining centre, the hydraulic power supply interfaces can become tricky. Also, the expertise of hydraulics is rarely available on-site.

With electrical clamping operated on extra low voltage like ELVA, the interfaces are safe, easy and reliable. Automated decoupling and

coupling of power supply in pallet pools, buffers and FMS systems is effortless. This means easier adaptation of automated workpiece loading in these systems.

When new, innovative machine tending concepts are being created, there is now one more effective tool in use. Best case scenario is that the compact material buffer of the part handling system and the flexibility of pallet handling systems can be combined. This way machine shops can get the best of both worlds.

OK-VISE introduced the new electrical ELVA System at EMO in September.

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Safe handling of heavy pallets

Automated loading processes with robots become even more powerful. SCHUNK has further expanded its range of pneumatic robot couplings for pallet handling for this purpose. The new powerful VERO-S NSR3 138 robot coupling ensures process-reliable handling of heavy pallet weights. For the first time, the individual clamping statuses can be reliably detected and transmitted to the machine control system via IO-Link interface.

The maintenance-free robot couplings of the VERO-S NSR series have been setting benchmarks for high-efficiency, robot-assisted pallet changes on machine tools for many years now. Now SCHUNK, the automation technology, toolholding and workholding expert, is making the handling of heavy pallets safer and further expanding its portfolio for high-end pallet loading.

With the new VERO-S NSR3 138 robot module, SCHUNK is now launching an extremely dimensionally stable module with high pull-down forces, which can absorb higher moments, $M_y = 1,500 \text{ Nm}$ and $M_z = 1,600 \text{ Nm}$, than its slim, interfering-contour-optimised counterpart VERO-S NSR 160. The blow-off function integrated as standard ensures optimum cleaning of all reference surfaces and thus a process-reliable sequence. The module clamps by spring force via a form-fit, self-retained locking so that the full pull-down force is maintained even in the event of a pressure drop.

Transparency in the clamping procedure is provided by the optionally combinable AFS3-R IOL 138 monitoring unit, which allows the "module opened", "module closed",

"module closed with clamping pin" and "pallet presence" statuses of the robot module to be recorded and transferred to the machine control via the standardised IO-Link interface for the first time. This is a fieldbus-independent point-to-point connection that enables events as well as process and service data to be exchanged between machine control and clamping device and can be integrated into almost any fieldbus system.

The module is hermetically sealed and all functional parts are made of hardened, stainless steel, ensuring a long, maintenance-free service life. Locking is done in a form-fit and self-retaining manner. For unlocking, a pneumatic system pressure of five bar is sufficient. The use of non-oiled air is also possible. The repeat accuracy amounts to 0.02 mm.

Door opener to hydraulic expansion technology

At EMO 2023, SCHUNK presented a new toolholder: the TENDO Silver. It offers the perfect introduction to tool clamping using hydraulic expansion technology and scores as a precision all-rounder.

As a precision all-rounder, TENDO Silver complements the SCHUNK toolholder family superbly. The stationary toolholder is the ideal introduction to hydraulic expansion technology and offers an excellent price/performance ratio.

For a long time now, users in metalworking have been won over by the benefits of hydraulic expansion technology in toolholders. Tools are clamped via a hydraulic mechanism where, on inserting a screw, the internal pressure medium is compressed and the expansion sleeve elastically deformed. In this way, the tool shank is tightly enclosed. The high tension ensures absolutely secure holding of the tool and precise run-out accuracy of less than 0.003 mm. The outcome of this technology is optimum workpiece surfaces,



avoidance of micro chipping, protection of the machine spindle and a longer tool service life. The technological trick of the inner oil cushion is highly effective in damping vibrations that occur during machining. Hydraulic expansion technology is also far superior to other technologies in terms of sustainability since it is long-lasting, energy-saving and resource-conserving in use. The TENDO Silver from SCHUNK's economy segment provides users with an all-rounder which, in addition to its technological advantages, is also highly impressive due to its outstanding price-performance ratio.

As an inventor and leader in the field of hydraulic expansion technology, SCHUNK has now acquired 40 years of experience in this technology. Application-specific, differentiated segmentation of toolholders means customers receive appropriate hydraulic expansion toolholders according to their application and requirements. The goal is economical, efficient and resource-saving machining of parts, which users of the TENDO series have appreciated for decades now. The toolholders come finely balanced as standard and are suitable for high speeds. The tool shanks can be clamped directly into the toolholder making the TENDO series, with its micrometre-accurate tool changes in seconds, a genuine hit. Users thus save on setup time and can dispense with additional peripheral equipment.

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European launch for workholding stabiliser system at EMO

US firm Blue Photon has designed a new, photo-activated adhesive workholding system, comprising patented grippers and inserts, intended for use with stabiliser systems marketed by Big Daishowa and others that add extra rigidity to tall components while they are being machined.

The Workholding Stabiliser System received its European launch at EMO 2023. Representatives from European sales agent NCMT were on the stand throughout the exhibition to help with live demonstrations and answer questions.

The workholding system comprises a Blue Photon stabiliser puck, an adjustable stabiliser arm and a base mount, for which there are multiple options including T-slot, threaded hole and magnetic. The puck is positioned in an optimal location on the workpiece to provide maximum extra support during machining by transferring some of the cutting force to the machine table and structure.

The extra stability raises production

throughput by allowing faster feeds and speeds to be programmed without affecting the surface integrity of the part and also increases yield by avoiding scrap and rework that could result from unstable clamping.

The puck attaches to the workpiece using grippers placed into fixed inserts. It is simply necessary to position the puck and turn on ultraviolet light from a Blue Photon controller to cure BlueGrip adhesive previously applied to the grippers. The process is completed in 60 seconds, minimising idle time and maximising throughput.

Other notable benefits of the adhesive system are that there is no need to drill and tap or otherwise clamp the part, while the absence of additional workholding geometry means that cutter paths are unrestricted and cycle times are not unnecessarily extended.

There was also a representative selection of Blue Photon's other innovative adhesive workholding products on display. They are ideal for securing awkwardly shaped and/or delicate parts to allow maximum access to



tools for tight-tolerance, multi-axis milling, turning, electrochemical machining, electrical discharge machining, grinding or laser cutting. They are equally suitable for use in assembly or inspection.

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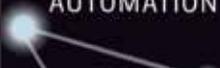
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Leading the way at EMO

As you might expect from one of the UK's most comprehensive providers of workholding, manufacturing ancillary systems and business efficiency services, Leader Chuck International has a number of key partners, many of which unveiled new and improved products at this year's EMO exhibition.

Autogrip manufactures chucks for turning, milling and special-purpose machine tools. Its newly developed series of stationary chucks are suitable for vertical machining centres, 4th and 5th axis rotary tables and the VR-808 Wedge Type Synchronous Clamp. With its compact design, workshops can place several sets of clamps on the same worktable of any milling machine. In addition, the VR-808 can be either pneumatically or hydraulically operated.

Balance Systems presented its innovative solutions for the process control systems of grinding machines. The company also showcased a number of new products, such as automatic ring balancing machines, the TQM measuring bench and the AE Envelope function. On the stand, visitors could also view the products and discover the services of EBS, including new balancing machines for production, retrofitting, contract balancing for third parties and a new portable balancer.

Since the company was established in Milan, Italy during the '70s, Cucchi Giovanni automatic bar-loading machines have revolutionised the precision machine tool industry, propelling production towards practical, innovative and affordable high-quality products. At EMO, the Model DBEVO-4.0 took centre stage. As one of the sector's leading automatic bar-loaders, it is able to feed bars of any profile including round, hexagonal, square, rectangular and oval. Handling a high rotation speed without any bar lubrication offers significant

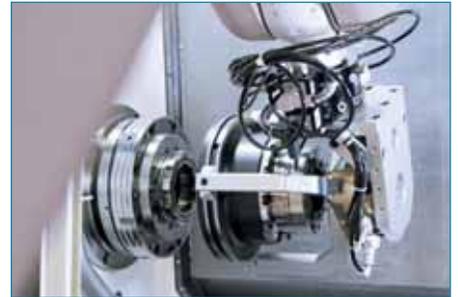


environmental advantages. The bar loader is available in different versions, with internal bar storage via slanting floor or bundle, with a bar passage capacity from 55 to 110 mm.

Exact is a professional global supplier with a robust technological R&D foundation, complemented by a workforce with state-of-the-art manufacturing equipment and a stringent quality control department. This is all enhanced by a professional distribution network, all of whom are committed to solution finding and complete customer satisfaction. Exact top quality CNC Rotary Tables and Indexing Tables are used in a wide variety of applications in the medical, aerospace and automotive industries, in the manufacturing of oil and water pipeline valves and equipment and in job shops where flexibility is required.

Mate is a world-class manufacturer of superior solutions for the metalworking industry. Using its decades of machining experience producing precision, high quality steel products for customers around the world, Mate designed and developed the ultimate next-generation 52/96 workholding system: Mate DynoGrip vices, Mate DynoLock bases and Mate DynoMount mounts and accessories. The 52/96 workholding system maximises holding power in a compact, quick-change modular design that reduces setup time and process variability. It's ideal for 3-, 4- and 5-axis machining centres.

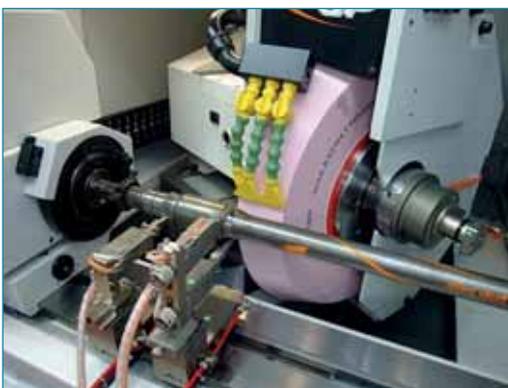
Piranha Clamp will exhibit its Piranha Cooling Line. A unique and versatile jointed hose system for precise coolant supply, Piranha Cooling Line is made from high-strength anodised aluminium. It can withstand pressures of up to 80 bar but can also be used at low pressures, where other cooling lubricant pipes wear prematurely. With the threaded connectors or ball



connectors it can be installed on all common toolholders and CNC machines, including turning and milling machines, grinding and sawing machines and central coolant systems and IBCs that can be fed and tapped into. In addition to the cooling lubricant supply, the Cooling Line system is suitable for clearing swarf out of chucks or off workpieces and for preheating material during 3D printing.

Rotomors develops solutions for customers in highly competitive markets using the right strategy with technological innovations. At EMO, the company is launching a new self-centring platform for vertical lathes, equipped with electronic controls that calculate the real-time closing force on the workpiece.

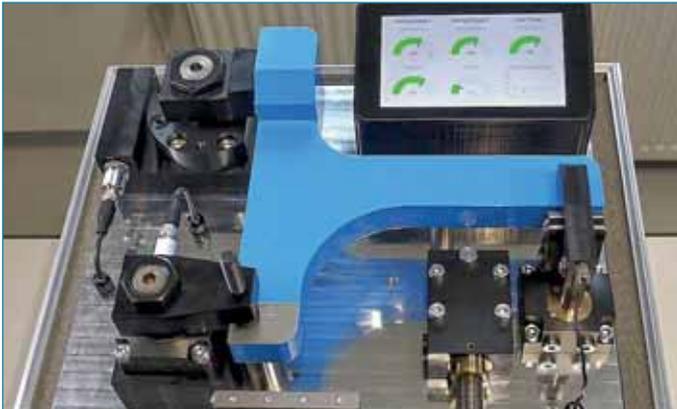
Zero Clamp pneumatic centring clamping fixture 160 offers powerful, infinitely variable clamping with forces of up to 45 kN at a maximum of nine bar of compressed air. What makes the centring clamping fixture unique is its low pre-tension of 60 kg, which 'lightly' holds loaded material, preventing the loss of clamped components when working with shuttle tables, for example, moving in and out of the machining envelope.



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Roemheld showcases automated and digitalised workholding at EMO

Workholding equipment manufacturer Roemheld unveiled at EMO a new, smaller version of its electric swing clamp, intended for automatically securing components for machining in areas where space is limited.



different clamping elements such as hinge, swing and bore clamps equipped with sensor technology for automated applications. Integrated clamping force, stroke position and pressure sensors measure values in real time and feed data back to a display to be monitored and recorded.

The sensor technology offers extensive information about the workpieces and fixtures prior to machining to ensure that a component is correctly and securely positioned. If errors are detected, the process is interrupted so that they may be corrected before production resumes.

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

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The two clamps are said to be the only models on the market to be electrically rather than pneumatically or hydraulically actuated, so are ideal for use when those services are not available.

Whereas the existing, larger model has an adjustable axial pulling force between 3 kN and 9 kN, the latest, compact model is rated at 2.7 kN and has a clamping stroke of 13 mm. Axial movement of only 3 mm is required to swivel the clamp through 180 degrees.

Belleville springs facilitate mechanical reclamping for precise workholding. Safe operation is ensured due to the self-locking spindle drive. The clamping force is maintained even if the energy supply is disconnected. For automation, all commands and information can be transmitted wirelessly via an optional IO-Link connection.

Industry 4.0-ready

Roemheld also showed how its workholding technology meets current and future requirements of Industry 4.0. Demonstrations featured

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Leading subcontract supplier invests in a Trimos V3 Height Gauge from Bowers

CTPE has been established for over 30 years, providing high-quality, precision CNC machined components to a range of high-tech industries including the medical, scientific, electronics, defence, and marine sectors. Understanding the high-stakes nature of the businesses it supplies, CTPE identified issues with its previous setup, particularly in relation to a restricted measurement capability and recognised the urgency of streamlining its processes.

The solution came in the form of the Trimos V3 Height Gauge. The V3 is renowned for its ability to measure large components with exceptional precision. Its robust construction, combined with advanced measurement capabilities, aligned perfectly with CTPE's pursuit of excellence.

Alex Taylor, operations director at CTPE Limited, says: "We chose to work with Bowers Group for this project as we have previously dealt with the company for other measuring equipment and have always been very happy with the service. The Trimos V3 is a great product from a famous quality Swiss brand and it has been a great addition to the Inspection department. It's a quality piece of equipment which has helped speed up our inspection times."

The V3 Height Gauge boasts a measuring range spanning from 400 mm to 700 mm, ensuring versatility in its applications. What sets it apart is the large 2-line 'Black Mask' display, a unique feature in the market that guarantees excellent contrast, regardless of

lighting conditions. Its user-friendliness has also proven to be a popular characteristic, with electronically adjustable measuring force and an easy-to-read display unit that provides direct and easy-to-read access to functions, enabling rapid operation.

With the Trimos V3 Height Gauge in place, CTPE's inspection capabilities have taken a significant leap forward. Employed on a daily basis for conducting first article, in-process, and final inspections of milled and turned components, the quality manager and machine setters were notably impressed by the height gauge's accuracy and repeatability.

The equipment excelled at precisely measuring the larger milled and turned parts that had previously posed a challenge, even allowing the team to measure specific features that beforehand were simply not possible. Its precision and reliability made the inspection process not only more efficient but also more accurate.

Moore & Wright fuel the University of Wolverhampton racing team

Formula Student is one of the most established international educational engineering competitions that aims to develop enterprising and innovative young engineers, as well as encourage more young people to take up a career in engineering. Organised by the Institute of Mechanical Engineers (IMechE), the event is celebrating its 25th anniversary in 2023.

It places rigorous demands on participating teams, requiring them to design, construct, and race a single-seat formula-style race car. The process is one in which precision engineering plays a vital role in ensuring both optimal performance and safety of the vehicle.

As part of the annual event, the UWR team faces the challenge of creating a car from scratch that not only meets rigorous performance standards but also adheres to strict design and manufacturing tolerances. Students must demonstrate project management and innovative features within the parameters allowed. They must start with a concept and operate almost as a business, incorporating engineering design and validation, project management, hands-on manufacturing, and testing.

Bowers Group has been a valued sponsor of the University of Wolverhampton Racing Team for many years, lending its support to students pursuing careers in engineering. This collaboration has been significant in providing students with exposure to industry-standard instruments and an understanding of precision measurement principles.

Through its sponsorship, Bowers Group supplies both the UWR team and the School of Engineering with the tools needed to both maximise racing performance and enhance practical learning. These instruments mirror what professionals use, giving students a chance to gain first-hand experience that goes beyond theoretical knowledge. This support helps bridge the gap between classroom learning and real-world applications.

Moore & Wright hand tools contribute to ensuring accuracy and precision during the car's construction, providing reliable support as well as helping measure critical components, making sure they match the precise specifications in the design plans. Knowing that the brand is a trusted name for precision gives the team assurance as they work meticulously to construct the racing car.



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MUT-Tschamber transforms manufacturing efficiency with PrimeTurning and GibbsCAM

MUT-Tschamber, a mechanical engineering company based in Wehr, Germany, has embraced Sandvik Coromant's cutting-edge PrimeTurning™ technology in conjunction with the GibbsCAM programming solution. After an extensive benchmarking process, it became evident that this new approach offered a substantial productivity advantage and within one week MUT-Tschamber adopted the new CAM.

MUT-Tschamber Misch- und Trenntechnik GmbH is recognised globally for its expertise in producing custom industrial agitators. Situated on the German-Swiss border, the company's 45 employees possess extensive knowledge, enabling them to provide custom solutions for mixing various process media together including all types of liquids, gases and solids, such as salts, powders and granules. Over 30,000 MUT-Tschamber agitators are used across diverse industries, including chemicals, pharmaceuticals, water treatment and power plant technology.

A significant portion of their production is destined for competitive markets where efficiency and cost-effectiveness are paramount. For example, MUT-Tschamber supplies agitators for flue gas desulfurisation systems in India and China to remove sulphur compounds from the exhaust emissions of fossil-fuelled power stations. "In these

markets, price naturally plays a decisive role," explains managing director Hanspeter Tschamber. "To be successful and competitive in these markets, we must continuously improve our process efficiencies. Therefore, we are very pleased to gain this significant competitive advantage with PrimeTurning and GibbsCAM."

Rising from the ashes

The company's success story began in 1979 and almost came to an abrupt end on 30th December 2022 due to a major fire. Just one day before New Year's Eve 2022, the entire production and office complex fell victim to a major fire. That same evening, the Tschamber family decided to rebuild the company on the same site. Despite significant challenges, including temporary premises and facilities, the company swiftly resumed operations. By January, only two weeks after the initial fire, the company operations were almost back to normal business levels.

MUT-Tschamber's customers typically demand customised agitators that meet specific project requirements and constraints. To achieve this, the company has an experienced project planning and design department. They meticulously translate customer specifications into precise manufacturing and assembly processes that



Pascal Waringer (Sandvik Coromant), Jürgen Kerscher and Yannik Tschamber (from left) watch the benchmark machining of the insertion agitator shaft

involve drives, shafts, bearings and agitator elements. A deep understanding vessel geometry, material properties, temperature, pressure and compliance with industry regulations and standards is essential for producing tailor-made agitators.



Agitators from MUT-Tschamber are used for a wide variety of applications. The main components of the assembly are the drive, the insertion shaft and the agitator element, as well as flanges, seals and bearings

Engaging Sandvik Coromant and GibbsCAM

MUT-Tschamber has a longstanding history of using tools from Sandvik Coromant. In 2022, it explored the capabilities of PrimeTurning technology in collaboration with its regional partner, HeRo Werkzeuge & Maschinen. "At that time, we immediately recognised the potential of the technology for us and decided to investigate further," claims Yannik Tschamber, junior technical manager. "We then had the opportunity to take a look at the machining process live at the Sandvik Coromant Centre in Renningen and it became clear to us that PrimeTurning would help us to massively increase our productivity. It was also clear that we needed a new CAM system for the successful use of

the new technology as we had been programming directly on the machine control.”

MUT-Tschamber explored various options but found a perfect fit in GibbsCAM after a recommendation from a Sandvik Coromant employee. The software's optimal support for PrimeTurning strategies and the CoroPlus® Tool Library made it a compelling choice.

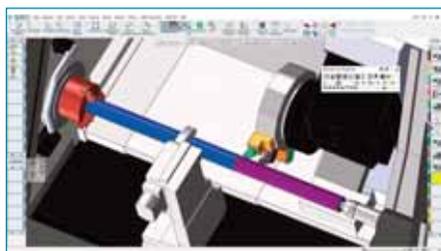
Machine inventory

“Before the fire, we had a total of six CNC lathes or turn-mill machines from Mazak and DMG MORI,” reports Senior Tschamber. “What the fire might have spared was completely destroyed in the course of fighting the fire.” Fortunately, a neighbouring company provided a Mazak Integrex i-300 with which they were already familiar and MUT-Tschamber immediately put the multi-tasking CNC machine to work for the production of shorter shafts up to 1,200 mm in length.

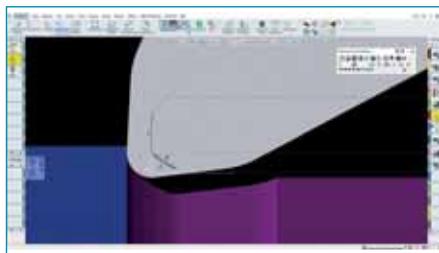
For longer shafts with a length of up to 3,055 mm and more complex component geometries and flanges, MUT-Tschamber procured a SMEC SL 4500 LM from Samsung, equipped with a milling spindle with B-axis, tailstock, steady rest and 80-fold tool changer. In addition, a SMEC SL 2500 BY demonstration machine, equipped with an additional Y-axis, was added for shorter shafts.



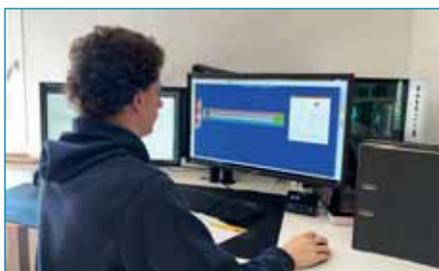
The benchmark shaft on the SMEC 4500 LM. The machine is equipped with a main spindle, NC-controlled steady rest and tailstock and a 12-station turret (with four stations for driven tools) and is ideally suited for shaft machining up to approximately 3 m in length



The machine simulation of the benchmark part on the digital twin of the SMEC SL 4500 SM in GibbsCAM ensures the highest process reliability



A small automatic intermediate step in the GibbsCAM PrimeTurning strategies prevents contact of the full cutting edge on the part. The image depicts the step in the simulation after clearing (Toolpath 2), before the insert plunges to the final depth (Toolpath 4)



Yannik Tschamber in front of the new GibbsCAM workstation. The junior technical manager is convinced that GibbsCAM enables MUT-Tschamber for future requirements

In August 2023, a benchmark was conducted at MUT-Tschamber to evaluate the effectiveness of Sandvik Coromant's PrimeTurning process incorporating CoroTurn® Prime A & B tools and GibbsCAM programming. The company machined a 1.4529 stainless steel insert shaft measuring 1,485 mm in length and 80 mm in outer diameter on the SMEC SL 4500 LM. When compared with the previous machining methods, the PrimeTurning process demonstrated remarkable advantages, including a 40 percent increase in cutting speeds, more than a 3.5x boost in feed rates and a fivefold rise in metal removal rates. The tool life of Sandvik Coromant's CoroTurn® Prime tools proved to be three times longer than other inserts, resulting in a quick return on investment.

Junior technical manager, Yannik Tschamber comments: “After the benchmark, we are extremely confident that we will achieve our goal of significantly higher throughput on just three machines, thanks to PrimeTurning and GibbsCAM, compared to what we could achieve with six machines in the past.” Further tests revealed excellent surface roughness of Ra 1 in finishing operations, even at significantly higher feed rates. The newfound resilience of the tools was highlighted during challenging scenarios like re-turning weld seams and over-cutting bores.

The GibbsCAM integration of PrimeTurning has been verified by Sandvik Coromant and includes all programming codes, tool models, cutting data and techniques for setting the correct parameters and variables.



Sandvik Coromant PrimeTurning

The negative rake angle of PrimeTurning produces a wider and thinner chip. This chip thinning effect allows significantly higher feed rates compared to conventional turning. While the advantages of a negative rake angle have been known for a long time, access to tight corners used to require two to three tool changes to prevent the cutting edge of the insert from completely touching down when plunging into the corner. The combination of PrimeTurning, CoroTurn Prime inserts and GibbsCAM programming cycles now enables machining in tight areas with a single tool. To do this, the corner is first cut free in a special cycle with the same tool. In the process, GibbsCAM uses variable feed rates.

The right programming solution for MUT-Tschamber

In addition to the advantages offered by the optimal integration of Sandvik technology into GibbsCAM, a number of other features were also decisive in the implementation of the new CAM programming software. GibbsCAM's intuitive interface and robust simulation capabilities left a strong impression on MUT-Tschamber. MUT-Tschamber's adoption of PrimeTurning and GibbsCAM has ushered in a new era of manufacturing efficiency, underlining its commitment to innovation and competitiveness. Despite facing adversity, its resilience and strategic choices have positioned it for future success, setting an inspiring example for the industry.

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People, process, principle

An aerospace parts supplier based in Wichita, Kansas, USA, has built a business on these three pillars. VERICUT toolpath simulation and optimisation software from CGTech helps support the second one.

Integrity and experience. Consistent performance. Clarity of purpose. These are words to live and work by, no matter what your vocation. They're also the guiding philosophies behind Trinity Precision Inc's motto, "People, Process, Principle," and ever since founders David May, Steve Ford, Dave Tice and Chris VanNover opened the company's doors in 2014, they've stood by them.

"When we started Trinity, it was important that we establish the foundations needed to assure success for the company and its employees," explains Chris VanNover, Trinity Precision's vice president of operations. "One of these was the use of robust programming technology, which includes accurate, productive toolpath simulation. VERICUT has filled that role since day one."

CNC programming manager Merritt Stuever has been there for the past five years. Like VanNover and the rest of the company's management team, he also has great respect for VERICUT including his time at Trinity Precision. He's been using the product for nearly two decades. "After running a program through VERICUT, you're not only assured that the G-code is consistent with a good part, but you also eliminate any chance of a crash," he says. "Considering the cost of replacing a spindle and the machine downtime that comes with it, it's a simple choice. VERICUT's a no-brainer."

To say that Trinity Precision is heavy into aerospace work is an understatement. Its customer list includes Boeing Commercial and Defense, Northrop Grumman,



Gulfstream, Textron Aviation and more, OEMs with zero tolerance for deviation in part quality or missed deliveries. As such, strict adherence to established processes is critical, which helps explain the aerospace supplier's early focus on 'the three Ps' in its logo, along with its reliance on sound programming procedures.

Trinity Precision president David May purchased an existing 'mom and pop' machine shop as a starting point for the new business. The previous owners were using a well-known brand of CAM software and had a single seat of CATIA from Dassault Systèmes that was gathering dust. David May and his management team hit the reset button.

Today, Trinity Precision boasts 32,000 sq ft of manufacturing space and a fleet of advanced CNC machinery. It has also enjoyed a four-fold revenue increase since those early days. Like most in the aerospace industry, the pandemic-related slowdown in commercial aviation gave them 'a pretty significant haircut' over the past two years, but that tide appears to be turning, and Trinity's 70+ employees stand ready for future growth.

As noted previously, however, that growth depends on robust processes, something

Merritt Stuever and the rest of the engineering team spend their days developing. Every CNC machine tool has a standard tool list, greatly reducing setup time and eliminating the chance that an operator will place a cutter in the wrong position.

In addition, all feed rates, cutting speeds and other machining parameters are similarly standardised within CATIA. Offline presetting is used and many of the machine tools employ tool breakage detection for automated operation. Every job goes through VERICUT before leaving the programming office, a requirement that Merritt Stuever says has saved the company countless hours of rework and even scrap: "We're mostly a high-mix, low-volume shop, so often times we might have a couple of dozen new part numbers in a week. Since none of us can read and visualise hundreds of thousands of lines of G-code, VERICUT is the best way to check for interference, gouging, leftover material and any of the other everyday programming scenarios that can lead to a bad part or worse. Since you know the software will catch things like that, it makes the programming process both easier and faster."

Merritt Stuever is pleased with CGTech's support level. He has taken several classes over the years and attended multiple VUE sessions (VERICUT Users' Exchange). Because of this, he's come to know many of the people in the software developer's Irvine headquarters. He concludes: "They're very helpful and always take the time to make sure any issues or needs are resolved."



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Hexagon's innovative new software suite provides a connected workflow for production machining

by Alexander Freund, director of product management for Hexagon's Manufacturing Intelligence division

For manufacturers who struggle to increase productivity by speeding up the same tried-and-true processes they always used, the concept of a connected shop that gains ground by simply using data at each step can sound too good to be true. Slowing down enough to analyse information and apply insights learned from the data that you're already generating can seem counterintuitive in an industry where speed wins jobs and repeat customers.

Tools available today that make these gains possible reflect the changing needs of manufacturers who can't produce parts any faster without sacrificing quality. While software developed specifically to meet the needs of production helps solve common shop-floor challenges, the ability to connect software solutions helps manufacturers use data to significant advantage.

Connectivity between Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM), and process verification systems makes it possible to carry a single source of data throughout the production chain for increased efficiency, and reduced error and redundancy. Connected solutions can also be combined with production-intelligence tools that use real-time data to provide valuable insights about machine-tool use and performance for increased return on investment.

Connecting solutions

Hexagon's Manufacturing Intelligence division recently introduced HxGN Production Machining, a new suite of software developed to empower machine shops to achieve operational excellence in the manufacturing of discrete parts, tools and components at any scale, from one-off prototypes to volume production.

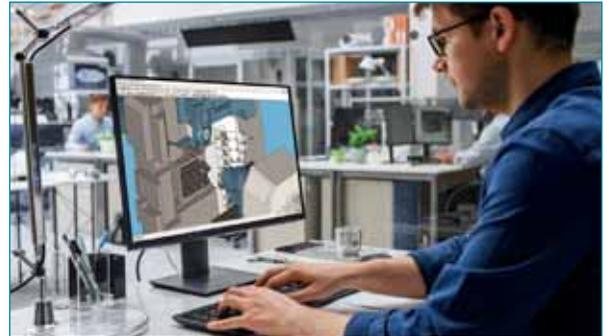
Capabilities of the suite include CAD for

manufacturing and design review, CAM for CNC machine-tool programming, process simulation and G-code verification and optimisation, shop-floor production intelligence and automation and collaboration powered by Nexus, Hexagon's digital-reality platform. The suite includes significant automation and innovative technologies that help manufacturers achieve efficient utilisation of material, cutting tools and CNC equipment and capture and consistently apply a shop's best practices.

The suite integrates common workflows to help teams reduce error and eliminate redundant tasks at every stage, from job quotation and design review through production, quality assurance and product delivery. By offering a suite of connected products from the Hexagon ecosystem, manufacturers benefit from simplified procurement, implementation and support. The intention was to be flexible to the user's needs, so the suite is suitable for shops of any size, all types of CNC machinery and any discrete part and material from one-off prototype to high-volume production runs.

The suite was developed to help manufacturers operate more productively and profitably using the principles of model-based manufacturing and robust software within a connected and intelligent digital workflow. It includes Hexagon's new CAM system, ESPRIT EDGE, which combines the strengths of Hexagon's EDGECAM and ESPRIT software with digital twin and Artificial Intelligence (AI) technology. Future developments will be supported by cloud-based Nexus, which will provide streamlined collaboration capabilities and the ability to consolidate job data for improved efficiency.

Preparing jobs for CNC programming is easier with tailored design-for-manufacturing tools developed to accelerate the transition from planning to production. Hexagon's DESIGNER software accepts CAD data from any vendor



and helps manufacturers easily visualise and analyse part model geometry. The software also helps utilise Product Manufacturing Information (PMI), such as tolerance, surface finish and material data. The suite is designed to preserve this valuable information across the digital thread to streamline production.

Interoperable with DESIGNER, Hexagon's trio of CAM systems for production machining can program any machine tool, including multi-axis, mill-turn, multi-tasking, Swiss-type and wire EDM machinery. The software applications, including the widely used EDGECAM and ESPRIT, and the new ESPRIT EDGE, provide a broad spectrum of machining cycles, programming for on-machine measurement, robust automation tools, machine-optimised G-code and the use of AI to automatically generate collision-free positioning between cutting zones.

Hexagon offers extensive CNC program simulation and verification capabilities to avoid collisions and optimise code for more advanced machinery and complex operations. From the CAM system, machine-specific G-code programs are sent to its NCSIMUL software, which incorporates the entire machining environment to generate a digital twin of the machinery, part, and processes for cycle-time optimisation, setup revision and program certification.

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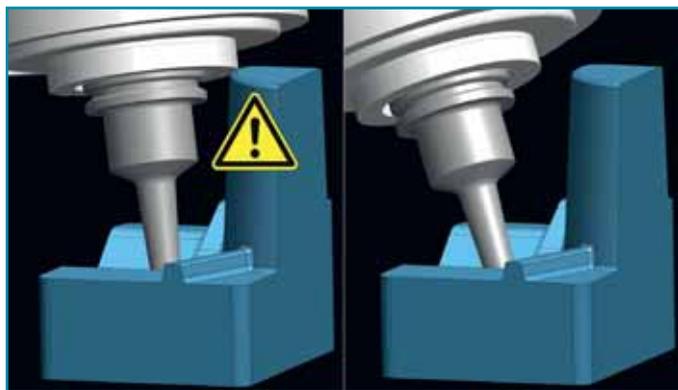
Tebis 4.1 release 7 is ready for rollout

With the latest release 4.1 of its complete CAD/CAM system, Tebis delivers on its promise to enable companies in die, mould and model manufacturing and production machining to manufacture extremely quickly and safely using ultra-modern CAM programming. The new CAM programming features offered by Tebis include optimised collision checking that accounts for the machine head and even faster and simpler processing of the most complex geometries.

Reiner Schmid, head of product management at Tebis AG, explains: "As a result of many factors, the situation has been growing increasingly critical for years, with increasing requirements and decreasing margins. Our approach is to give companies a clear advantage with our technological improvements. Tebis makes your manufacturing fast, safe and partially automatic and that keeps you competitive."

Optimised collision control

Starting from release 7, potential collisions can be automatically detected and avoided as early as the CAM calculation. This proceeds smoothly across all milling processes, while fully accounting for the machine head. The strategies in 2.5D machining and in 5-axis simultaneous avoidance milling have been extended accordingly. In 2.5D machining, milling areas can be optionally reduced or excluded from the machining operation. Tebis determines the correct pivot positions in 5-axis simultaneous avoidance milling.



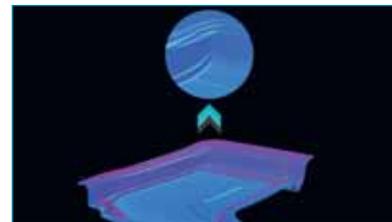
Potential collisions with the machine head are automatically avoided in 5-axis simultaneous avoidance milling

As Tebis accounts for both the special kinematics of the real machine as well as the precise geometry of the machine head, collisions with all machining components are already prevented in the virtual CAD/CAM environment and before NC output, reliably, automatically and with corresponding time savings.

Outstanding milling results that are faster and simpler, for complex geometries

In 3-axis finishing, complex geometries can be machined equidistantly with precise and constant stepover across the entire part in a single operation. This is now even simpler and faster in Tebis 4.1 release 7. Only up to two arbitrary guide curves need to be selected and the system takes care of the rest automatically. Extremely high-quality surfaces with no offset are manufactured on the machine with no need for manual reworking. This function is suitable for all complex parts in which first-class milling programs for 3-axis finishing need to

be generated with low effort, for example for forging dies in forming die manufacturing or for outer surface parts in car body die manufacturing.



Toolpaths for 3-axis equidistant finishing can now be programmed even more easily

Reduced residual stock and a shorter machine run time

Two different modes can be selected in 5-axis simultaneous roughing of pockets and surfaces, depending on the manufacturing situation. In the 'dynamic' option, the part is machined in five axes normal to the curvature of the surface. In the 'constant' option, machining is in three axes parallel to the curvature of the surface. Machining in 'constant' mode is especially recommended for thin-walled parts with vertical flanks and curved bottom surfaces, like those frequently manufactured in the aerospace industry. Residual stock is reduced to a minimum and can then be cleared in a single operation. This greatly reduces machine run time while maintaining high precision.

Tebis (UK) Ltd Tel: 024 76 236 412

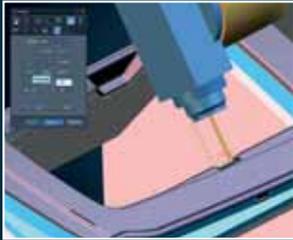
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Ladbroke Manufacturing invests for growth

A new LVD laser and two LVD press brakes, along with LVD's CADMAN software, will help Ladbroke Manufacturing expand capacity and continue to grow. The company has doubled turnover in the past two years and recently taken on additional premises.

Based in North Walsham, Norfolk, the business was set up in 1936 and is still owned and run by the same family. The latest investment includes a LVD YSD LaserONE 4 kw fibre laser, an 80 tonne Easy-Form hydraulic press brake with a 2.5 m working range and a 40 tonne 1.5 m electric Dyna-Press, also with the Easy-Form laser adaptive angle measurement system. The CADMAN software includes CADMAN-L laser software, CADMAN-P Punch software CADMAN-B bending software, CADMAN-SDI smart CAD file import software and LVD's CADMAN-JOB manufacturing execution system. Complementing this is a Touch-i4 shopfloor tablet.

Ladbroke Manufacturing started business as a high-volume press worker, but when a lot of this work moved overseas it diversified into sheet metal too. Both are now equally important strands of the business.

Commercial director Michael Peake explains: "We got into sheet metal around 15 years ago and since then it has become a larger and larger part of the business."

At that stage the company had a press brake and a second-hand Shape Delta punch press. In 2018 the decision was made to upgrade the punch press to a new LVD



Strippit P-1225 33-station turret punch machine.

Michael Peake says: "Our old Shape machine was 25 years old and had given us 10 years service by then and it was getting harder to keep going. We decided that to maintain our customer base and to take us forward we needed a newer machine. LVD had serviced the Shape machine for us and really looked after us. It was partly their service and their willingness to help that led us to go with LVD when we bought the new punch press."

Across its press work and sheet metal divisions, Ladbroke produces a wide range of components, from one-offs to high volume production runs in anything from flat parts to welded fabrications.

By 2021 sales started growing quickly, to such a point that the demand on bending was outstripping the capacity of the old press

brake. By 2022, they were also reaching capacity on the punch press.

Michael Peake explains: "We were having to plan runs, produce smaller runs and work overtime to keep up with the orders. As 2022 progressed we were getting to the stage where we were filling up our punch press in overtime. So, we were looking at adding another machine."

However, talking to LVD, Michael Peake found out that there might be an alternative solution. LVD had just launched a new entry-level laser, the LaserONE, with a level of investment cost similar to a punch press, and this could open up new possibilities.

Michael Peake says: "We went to see it working at LVD in Banbury and drove away that day really impressed with what the machine could do quality-wise at that price point."

"We have always supplied laser cut parts which we had to subcontract out. But by having the capability in-house we could be more flexible and with the punch press and laser together it could give us a lot more options."

The question was whether the cost to produce parts in-house would be competitive with buying them in.

Michael Peake continues: "LVD did some cost studies for us on a lot of the parts we were looking at making. It was clear that we could bring the parts in-house and match the prices we were paying to buy them in. So, we had the advantages of having our own machine while also knowing that we were going to be competitive in the marketplace."

At the same time, demand on the press brake was becoming overwhelming. Michael





Peake says: "Business kept increasing so we knew we needed to do something. If we were going to move forward, we needed to create enough capacity, not only to keep up with what we were doing but also to bring in more business and grow the company. That is when we placed the order for the laser and the two press brakes with LVD. The quality of the machines and the service are top notch. It is more of a relationship rather than just buying a machine."

The larger hydraulic Easy-Form press brake and the smaller electric Dyna-Press machine complement each other well. Both machines have LVD's Easy-Form adaptive bending technology, which guarantees the correct bend angle every time.

The intuitive touch screen controls on the press brakes have proved to be very user-friendly and easy to get used to. As they

are effectively the same on both machines the operators can easily switch from one to the other.

A big part of the new investment is, of course, the CADMAN software. In the past, although the punch could be programmed offline, the press brake had to be setup on the machine.

Michael Peake adds: "We had a twenty-part package last week. That would normally take me two or three days to quote. Now it took me half a day to work out the costings and half a day to work out the times. So that is a day rather than two or three days. And you know that your information is bang on rather than just a gut feel."

The next step will be to implement CADMAN JOB and the Touch i-4 shop floor tablet, which will come once the team have got used to the new machines.

CADMAN JOB acts as a central production control to manage workflow to the machines and monitor the current status and workload. This can then help to increase throughput and minimise setup times while giving real-time visibility of the complete process.

The LVD Touch i-4 tablet ensures that all this information is instantly available on the shop floor. It gives production staff an instant overview of the current status and allows them to track parts and manage workflow. This new investment will help Ladbrook Manufacturing to keep up momentum on its growth.

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Laser technologies in mass production systems

Laser cutting technology has had a profound impact on mass production systems across various industries in the recent decades. Its precision, speed, and consistency have innovated manufacturing and industrial processes in several ways, leading to dramatic cost-per-part savings.

The remarkable diffusion of laser technologies in mass production systems is particularly evident in many industrial sectors, where it is widely common to find 2D laser cutting machines integrated into the production line.

This article will focus on the methods of integrating laser cutting technologies into industrial production systems and current development trends. Additionally, it will touch on the role played by Prima Power in the evolution of this technology and its ability to provide dynamic solutions to improve the production process of its customers.

Machines based on laser technologies and 2D laser cutting machines are generally reliable, fast and precise, especially if they are strategically selected to the applicable needs of the production system in which they are to be integrated.

For all these reasons, laser cutting machines are widely recognised as a highly productive yet consistent technology that is also capable of significantly reducing production costs, which is why many companies aim to integrate them into their production lines. With increased market demand, Prima Power presents itself as a reliable and competent partner not only for the sale of 2D laser cutting machines but customer-centric solutions for any production context.

The role of Prima Power

Thanks to Prima Power's in-depth laser technology knowledge, developed over the past forty-five years, it approaches the challenge of integrating laser cutting systems into production lines by focusing on the customer's needs and future goals.

When introducing a new laser cutting machine to a production line, flexibility is paramount. Understanding customer's unique requirements and the nuances of their current production systems is crucial to seamlessly integrate a new machine with the existing ones. Also, in the context of Industry 4.0, it is important that the new manufacturing machines communicate smoothly with the customer's management system, providing useful operating data to enhance overall output performance.

In effect, 2D laser cutting machines achieve their highest performance levels when integrated into a fully automated production line. Aiming to give the best customer support, Prima Power offers tailor-made solutions and therefore perfectly integrated with each other, for the automation of production processes and the storage for raw materials and finished parts.

Prima Power's mission is to provide a comprehensive consulting service that enables customers to improve their business results by modernising their production systems. To achieve this, it consistently provides customers with a modular automation plan for their production processes. This approach enables us to ensure seamless integration across all components.

Software integration in a global vision

To integrate one or multiple 2D laser cutting machines into a production line, it is necessary to carefully study the production and structural constraints of the pre-existing space. It is also key to understand the output target that the company has for that specific product. Thus, Prima can consider the line as a whole and is equipped to evaluate how to optimise the full production flow.

There is no doubt that a laser metal cutting machine offers its best performance within an automated line that can follow its production pace, but this may require an investment that is currently not sustainable for the company.

This is why Prima Power offers its customers modular solutions for machines and a strategic plan for the gradual automation of the production processes, including an automated warehouse. On the other hand, its strength lies in the fact that it also produces the software that controls all its machines and its automation systems, thus guaranteeing perfect integration between all the operations involved.

In the context of 2D laser cutting machines, Prima Power is characterised by the development of a highly productive and flexible fibre laser machine accompanied by user-friendly proprietary software solutions. This integrated approach ensures the optimisation of all processes, allowing it to progressively build exceptionally efficient production lines. Its primary goal is to help customers reduce their cost-per-part while increasing overall efficiency.

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The laser cutting system for extra-large parts

Anyone who wants to cut large parts or quantities needs a large laser cutting machine. The new ByCut Smart 12025 is the ideal tool for this purpose.

The latest model from the ByCut Smart series is called 12025 and also represents the new generation of Bystronic laser cutting systems. This laser cutting system also impresses with its sharp and modern design with large capacity and laser powers for every need.

Plenty of power

After the 'small one' now comes the XXL machine: the new ByCut Smart 12025. With a huge cutting length of up to 12.2 metres and a width of 2.5 metres, the ByCut Smart 12025 is an imposing presence. Thanks to the extra-large cutting format, you can effortlessly and quickly cut both very large and many small parts efficiently, thanks to outstanding nesting processes.

Its latest laser cutting machine optimises sheet utilisation thanks to the 12025 cutting format, up to 15 kws of laser power and the



optional BeamShaper at an advantageous price. Even more sheet metal, even more, larger parts and thus more variety.

The clever features make the difference

The laser cutting systems of the ByCut Smart series are extremely flexible and impress with their maximum configurability. Smart features such as the Nozzle Control Tool (NCT) and KerfScan, the Parameter Wizard, or cutting with MixGas, in addition to plenty of laser power, ensure high cutting quality and also increased productivity.

Better access

Like the 6225, the other member of the

family, new, modern contours give the 12025 a sharp look to match the machine's performance. Ease of use is greatly enhanced by the new design. In addition to the front access, there are several windows along the entire length with a direct view of the cutting process.

Grace Gong, global product line manager for cutting & tube, says: "With its large dimensions, the brand new ByCut Smart 12025 is the ideal laser cutting system for oversized parts or large quantities of smaller parts."

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Sustainability, compact automation and smart functionality

The future of the laser is already here. The patented, cutting-edge design, an extremely wide automation offering and a range of advanced process control and efficiency solutions are the cornerstones on which Salvagnini built the L5 laser. It is a high-performance system, with high dynamics especially on medium-thin thicknesses, with reduced power consumption and competitive running costs, whatever the application, material and thickness, as it is equipped with a single laser head which allows all workable thicknesses and materials to be cut.

The productivity and profitability of a laser is affected by market and technological factors. If the laser cannot control the batch size, frequency of production changes and mix of materials/thicknesses, its technological features, machine dynamics, source power, level of automation and digitalisation, process sensors, can help manage the complexity of ever-more dynamic productions.

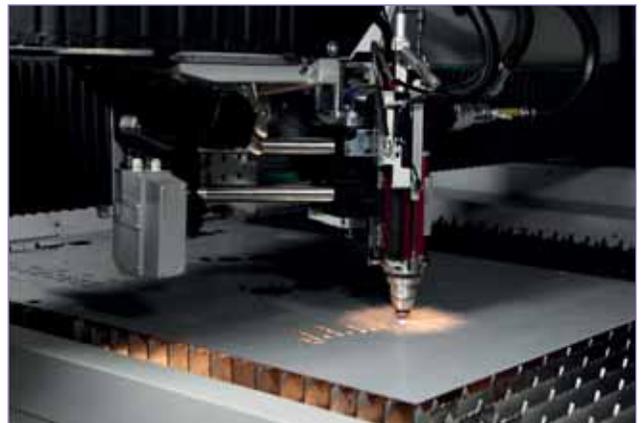
The range of thicknesses and the cutting performance depend on the power of the source. Salvagnini recently introduced a 8 kW high power density source in its product portfolio, guaranteeing cutting speeds higher than any other traditional 8 kW source and at thicknesses of up to 6 mm achieving cutting speeds even greater than those of a 10 kW source. At Blechexpo, Salvagnini presented a world preview. In yet another development, the new 8 kW high-power density and high-efficiency source guarantees 50 percent higher performance, values never seen before for a cutting source. This new offering, in addition to its performance, can also be extremely advantageous in terms of financial sustainability. Reducing the power of the source while keeping the cutting speeds high means reducing energy and gas consumption for the same performance. In addition to lower consumption linked directly to the source, it also allows for a reduction in the chiller size. Consumption is therefore very similar to that of a 6 kW source.

Increasingly smaller batches demand rapid automation for quick production changes, with low consumption and minimum waste. In the configuration presented at Stuttgart, the L5 is fed by ADC, the compact automation



for sheet metal loading and unloading. Its strengths are compact footprint, rapid cycle times and fast installation. Like all the Salvagnini automations, ADC is also equipped with the new AVC adaptive vacuum control technology. AVC constantly monitors the vacuum degree in the gripping suction cups and vacuum generation is activated only when required, resulting in a reduction in compressed air consumption of around 90 percent. ADC uses a comb unloading device featuring a set of belts, these slide the sheet metal slowly when depositing it reducing the risk of damaging the material or the cut parts.

The cutting system offered by Salvagnini also features a wide range of advanced process control and efficiency solutions, which improve the performance of the L5 and make it a versatile and easy-to-use laser. The L5 is equipped with the APC2 adaptive process sensor which monitors piercing in real time, for greater speed and higher quality. The sensor checks for any cutting losses, for both nitrogen and compressed air, in the event of a fault, stops the process and resumes it with suitably remodulated parameters. APC2 also allows for automatic



focal length search. In order to further simplify some activities which are potentially time-consuming or could generate errors or waste and therefore reduce the overall efficiency of the system, it is also equipped with a number of artificial vision applications. These are simple solutions that increase the flexibility of the system and broaden its field of application. AVS turns laser cutting into a workstation downstream of punching, thus guaranteeing the maximum precision of the cut parts. NVS checks that the laser beam is centred and uses the machine learning algorithms to monitor the state of the nozzle and reduce waste. SVS recovers sheet metal leftovers, responding to urgent needs or replacing any waste in downstream machining activities. production programs with a simple drag-and-drop. With the Salvagnini L5, cutting has never been easier.

Additional L5 highlights

Impacts is the new product that measures the consumption of electricity, compressed air and assist gas in the L5 laser. It is the first step towards calculating volumes of CO₂ equivalent of each single manufactured component. Impacts is used to monitor and become aware of our own consumptions, to optimise and reduce them. It increases profitability, because reducing consumption means reducing running costs.

The L5 load-bearing beam structure, with a lightweight airplane manipulator, offers many advantages: high rigidity, rapidity, positioning precision and accessibility to the whole worktable. The head is coupled with the compass, a mechanical structure made of carbon fibre, which guarantees high precision even in the most aggressive cutting mode. Using only rotary motors, the compass moves the head on the XY plane with high dynamics, reaching 5g accelerations on short movements.

FACE is the Salvagnini HMI for the whole product range, with the same look and feel for all technologies. FACE reduces the time required for interaction, as each function is immediately clear and available in just a few

clicks. The central position of the touch screen monitor also guarantees total control over all operations, ensuring full visibility of both the cutting area and the pallet changer.

Automation plays an increasingly important role. It reduces the risk of loading and unloading becoming bottlenecks and can help to reduce the impact of labour costs. In addition to ADC, the L5 can be configured with many loading/unloading and sorting connections, responding to any need: from stand-alone operation to integration in flexible cells or automated factories that work unmanned.

Salvagnini is a benchmark in cutting with compressed air, one of the most interesting hot topics of laser cutting. The ACUT option allows Salvagnini lasers to cut with suitably treated compressed air. Today ACUT can cut thicknesses up to 20 mm, with similar productivity to cutting with nitrogen but at a lower cost. Cutting with compressed air is cheaper than with nitrogen, all the more so when the cost per m³ of nitrogen increases. The higher the cost of nitrogen, the more cost-effective cutting with compressed air becomes.

Software can also contribute to reducing



operating costs and waste. STREAMLASER, the Salvagnini software for cutting programs that is part of the STREAM programming suite, has two distinctive features for improving material efficiency and reducing costs. The first is OPTI, the nesting algorithm, which optimises the use of the metal sheet, minimising scrap. The second is SAFE GRID, which automatically optimises part positioning on the grids, reducing their wear and maintenance costs and improving machining quality and laser reliability.

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Havant Sheet Metal puts its trust in MSS again with renewed Nitroskid system

Sheet metal fabrication and coating specialists, Havant Sheet Metal has just installed a brand-new MSS Nitroskid Nitrogen Generation system for its laser cutting operations. Experts in fine sheet metal cutting and fabrication work, HSM need to ensure its laser cutting work is of the highest quality to meet the exacting needs of its customers.

Tony Molloy, operations manager at HSM comments: "We have been using MSS nitrogen systems products for over 11 years and we've found their equipment to be very reliable and much more cost-effective compared to buying liquid nitrogen in bulk. The decision to replace the old system was taken as we recognised that current technology available from MSS would offer use the best and consistent quality nitrogen cutting gas and save us even more money on our running costs than its predecessor".

The new Nitroskid 1 system is now used to supply high purity nitrogen for HSM's high performance 4 kW Trumpf fibre laser cutting system.

MSS sales director, Chris Smith comments: "This was a challenging installation in a very confined space. It's pleasing to see how well the new equipment installation work went. The system was up and running in just one day, allowing HSM to continue with their cutting work with minimal disruption. MSS is privileged to retain the custom of a valued client like HSM and we're both looking forward to at least another 11 years of reliable equipment service and cutting gas supply."

Tony Molloy adds: "The MSS nitrogen solution is ideal for us, we never run out of gas, we don't have to worry about any regular



ordering or deliveries of cylinder packs, the quality of cut is great and it works so well we never even realise we have it sometimes."

The Nitroskid system provides high pressure nitrogen up to 300 bar at 99.9975 percent purity which comfortably meets the application requirements of the fibre laser. The bespoke system design fits the available space very well with plenty of access for service and maintenance work. The system's 288 m³ high pressure storage tanks ensure plentiful supply of consistent high purity nitrogen to the laser system even when cutting thicker gauge materials.

Chris Smith says: "This latest generation Nitroskid is significantly more efficient than the older system installation. We estimate that HSM will save around 30 percent on their nitrogen costs with this new PSA equipment. The latest generation MSS Nitrocube is the most compact and most flexible system

available anywhere in the world, MSS now has over 1,200 lasers operating with their high-pressure nitrogen generation technology worldwide and the popularity of this product is growing very quickly, this latest product incorporates all we have learnt from high pressure nitrogen systems for laser cutting applications over the past 20 years."



Biogas boosts green credentials with on-site nitrogen generation from MSS

Innovative renewable energy technology specialists, Biogas Products Ltd in Dudley has recently added a new MSS Nitrocube high pressure nitrogen generation system to its laser cutting operation.

Having used bundled gas cylinders to supply its fibre laser previously, Biogas decided that it would benefit from the flexibility and convenience of a Nitrocube system. Tony Smith, managing director, comments: "We often experienced some production issues and inconvenience directly connected with our use of bundled cylinder pack gas, we knew that our gas use was only going to increase so we felt that a change was needed. MSS were able to demonstrate to us an excellent understanding of our nitrogen cutting gas requirement from early enquiry stage and this expertise has continued through to the successful installation and operation of our new Nitrocube system."

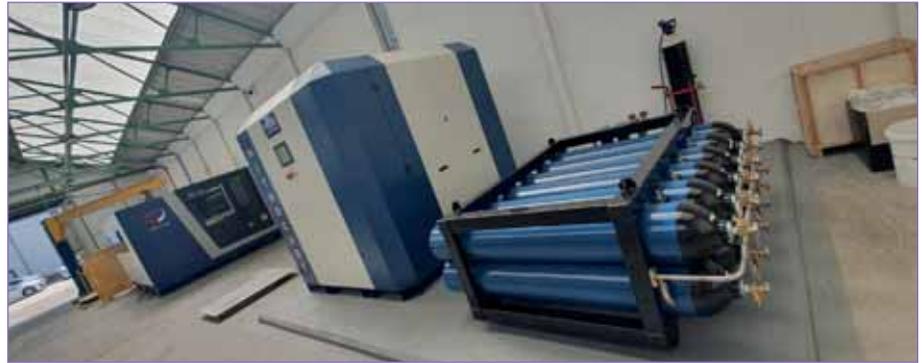
Chris Smith comments: "Biogas needed a reliable and economic solution that also offers future proof capacity and our Nitrocube 2 system met their requirements very well. This model is extremely powerful for the floor space required taking up only 2.2 x 2.4 m with stackable high pressure gas storage cylinders taking up less than 2x2 sq m space."

The Nitrocube 2 system supplied provides



high pressure nitrogen at 20 m³/hour flow and 99.9975 percent purity which is ideal for high quality laser cutting, especially for thicker stainless steel. The system features 288 m³ of storage at 300 bar pressure. All the latest generation MSS Nitrogen systems use the very best components available today which combine to make each system super-efficient. Typically using 25-40 percent less energy to generate higher purity nitrogen than other systems available. The new system also features MSS's unique touch screen control panel that allows remote system performance and status monitoring.

Tony Smith adds: "The MSS Nitrocube has now proven itself to be more economical



than bundled gas cylinders and also delivers higher quality nitrogen which has improved our cutting quality and reduced the amount of cleaning up needed. We now don't have to

worry about running out of gas as we have our own dedicated supply which generates the right quality nitrogen only when we need it."

With over 1,200 systems installed in the UK and US, MSS is a leader in high pressure generation systems for laser applications. It has 20 years of experience manufacturing in this market and MSS equipment is considered the most efficient and advanced nitrogen generation systems available today.

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Perfect symbiosis of welding technology and kinematics

Welding engineers all over the world associate the name Fronius with innovative welding technology. Above all, the innovators are known for providing high-performance, high-tech welding systems. The name Fronius is also associated with revolutionary welding processes such as Cold Metal Transfer (CMT), intelligent seam detection sensors such as WireSense, and the brand-new DynamicWire wirefeeder.

However, there is little awareness across all industries that Fronius Welding Automation supplies automated welding systems from a single source. Only in the oil and gas offshore sector does the company have a strong profile among potential customers as a renowned manufacturer of cladding systems.

There is a long tradition of plant construction at Fronius. Take, for example, the longitudinal seam welding system from 1979 for welding sheet metal sections made of steel. The company has been developing sustainably designed welding systems that have future potential since 1975. That's why most of its solutions can be upgraded and expanded by adding extra features such as welding processes, sensor technology and software updates. Today, more than 3,500 installed systems are in use across 45 different countries with over 2,000 active customers.

Since the invention of the 'cold' MAG welding process, Cold Metal Transfer (CMT), if not earlier, Fronius has continuously achieved technological leadership in many welding-related areas, resulting in state-of-the-art mechanised and automated welding systems. Advanced power source technology stabilises the arc and ensures

perfect welding results. Modern monitoring sensors optimise guidance of the welding torch and compensate for component tolerances. Last but not least, smart data documentation systems assist in perfecting the welding process.

Collaborative systems, intelligent sensor technology, software solutions for data management and offline programming including welding simulation open up profitable welding opportunities for metal processing companies starting with a single batch. That is why Fronius robotic welding cells prove profitable not only for large companies, but also for small- and medium-sized enterprises.

The specific requirements for the welding technology are analysed together with the customer. This is followed by the creation of an individual solution. To do this, Fronius has an extensive construction kit of standardised components at its disposal. Starting with the feasibility study and continuing with planning, engineering, manufacturing and start-up, the sale of welding systems is handled as a project. During this time, customers have one main point of contact: the project manager. He or she takes care of the entire project process and acts as the interface between the customer and all the Fronius sections involved. In doing so, the project manager ensures that processes run smoothly, cooperation is effective and projects are successfully completed.

Almost every project starts with a feasibility study, which determines the entire engineering process. It forms the basis for a solution that is tailored both in terms of

technical and commercial viability. The integration of welding technology into the kinematic elements depends on the following factors: component conditions, process accuracy and profitability. Welding Automation sources specialised components such as robots, sensors, clamping



systems and shelving systems from qualified cooperation partners.

Fronius provides and relies on software solutions that enable a high degree of control and optimal interaction between all system components. Pathfinder provides all customers with an offline programming and simulation solution that significantly increases the profitability of welding systems. WeldCube is programmed for the evaluation of welding data. The innovative software seamlessly records welding data, makes welds reproducible without any limitations and supports users in identifying optimisation potential and maintenance intervals.

Right from the start and throughout the entire service life of a welding system, Fronius Welding Automation is there to help its customers wherever they are in the world: providing support with everything from planning to feasibility studies, welding tests, commissioning, user training, remote maintenance, calibration, predictive maintenance and on-site maintenance work.

All welding torch movements are controlled automatically without the use of robots. Robots are used to control the movement axes. They are ideal for automating complex welding tasks on a variety of components, in combination with intelligent offline programming and simulation software for batch sizes as small as one.

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Perfecting the welding process for rotor shafts

Sales of electric cars are on the rise and at an enormous pace worldwide. The International Energy Agency (IEA), for example, estimates that 14 million e-vehicles will be sold this year, representing a 35 percent increase in sales compared with the previous year. This means that they already account for almost one-fifth of the total car market. As a result, production planners are focusing on the manufacture of key components of the e-motor, such as the rotor shaft. They are looking for innovative solutions "from a single source," with which the component can be machined particularly efficiently and reliably in ever larger quantities. EMAG LaserTec is currently setting an example in the market with its ELC 6 laser welding machine. In the machine, joining, preheating and welding processes are compactly combined on an assembled rotor shaft with its rotary table system ensuring optimum cycle times.

Advances in e-mobility, including hollow designs of components, allow great freedom in design, lighten the weight and lower material costs for assembled rotor shafts. At the same time, this "heart" of the electric motor has to withstand particularly high loads, as motor speeds of up to 20,000 rpm are now possible. Compared to a camshaft in a combustion engine, for example, this value is many times higher. Thus, the production of assembled rotor shafts is always about manufacturing tolerance even minimal imbalances must be avoided at all costs, because they would endanger the service life of the engine. In addition, the process must result in a highly stable component.

In this context, what is the most efficient way to reliably produce increasing quantities in the face of an expanding market?

One answer to this question leads directly to the innovative technology of EMAG LaserTec, because the company, based in Heubach near Aalen, has an impressive track record with laser welding, which is indispensable in building the two-piece rotor shaft. All the leading automotive manufacturers have the associated systems with the abbreviation "ELC" (EMAG Laser Cell) in use in various application areas. The key to success is a high level of competence as a system supplier. EMAG LaserTec knows the entire production sequence of the respective components and develops the complete process chain on this basis. On the customer side, the planning of new or the



expansion of existing production facilities is therefore massively simplified. In addition, the whole process is based on EMAG's modular mechanical engineering, which includes a large number of proven components.

It is precisely this quality that the southern German laser specialists have been bringing to the production of assembled rotor shafts for some time now. The ELC 6 machine is at the centre of this, a highly efficient solution for joining the two halves of the component, with part handling, preheating and joining as well as welding taking place in quick succession and perfectly timed by the rotary table. The precisely metered, concentrated energy of the laser beam permits high welding speeds with minimal distortion on the welded component. A look at the details reveals the performance of the machine, which was specially developed for powertrain components with circumferential welds:

- Before the individual parts are loaded into the ELC 6, the workpieces are laser cleaned. For this purpose, EMAG LaserTec offers the LC 4 laser cleaning machine, which can be optimally linked-up with the ELC 6, thus ensuring seamless line integration.

- In the next step in ELC 6, preheating and joining, the induction technology first ensures an ideal processing temperature on the component before the two components are joined.

- Before welding, the weld seam position is checked and the component position is readjusted. The contour is scanned with precision and the data is communicated to the welding optics and the NC axes.

- During the subsequent welding process, the vertically arranged workpiece rotates, while the laser optics only move radially towards the workpiece. The welding process with its focused energy thus takes place virtually from the side at the circumferential weld. A pyrometer controls the process temperature.

- After welding, the component is transported out of the machine by a swiveling motion of the rotary table and unloaded by a robot.

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Ficep UK launches new robotic welding technology

Ficep UK has launched a new automatic and robotic processing solution. The request from the market is for a quality welding system to help address skilled labour shortages and increase productivity.

In an exciting new partnership with AGT Robotics, Ficep has launched the SABRE welding robot to seamlessly tackle the most challenging and labour-intensive processes that fabricators are facing in today's structural steel fabrication market.

The SABRE complements Ficep's existing machine range by performing the robotic welding of all secondary components on the main member. The SABRE automatically senses all the relative surfaces so the robotic welding process can be generated without any manual manipulation. The operator simply needs to load the section after the detail has been tack welded at the proper locations into the automated welding positioners.

Combining the Ficep SABRE welding robot with Ficep E Lexington system, which makes laser marks on the steel to indicate locations and welding codes, can match the productivity of up to eight employees who

would traditionally use manual layouts and welding.

Further simplifying the process, its unique software automatically downloads the CAD data, or auto-generates welds as per customer specifications. This eliminates the need for manual programming or adjustments. As the robot welds the first section, the operator can load and tack weld the next section into a second set of rotators and using the E Lexington will see the position of the secondary part with high quality laser lines. Once the SABRE has finished welding the first section, the robot moves to the next section for welding while the first section is being unloaded by the operator.

Ficep UK sales director, Chris Berriman, says: "We are delighted to bring the new SABRE and E Lexington system to the UK. It is an impressive, yet competitively-priced, robotic welding system which eliminates manual layouts and automates the welding processes of rolled structural steel shapes and fabricated beam sections. It has camera vision for scanning parts and, coupled with its reliable software, further improves productivity. What's more, the SABRE has the



smallest footprint of any robotic welding system offered to the UK market, which helps free up customers shop floor."

Ficep UK's dedicated engineering team will review customer applications and work with them to design the proper configuration for their facility. As it is a modular system, the integration of the SABRE can be implemented in stages, if desired, therefore reducing any disruption to operations.

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ESAB launches Renegade VOLT

ESAB's Renegade VOLT ES 200i MMA/TIG battery-powered welding system, which the company developed in conjunction with Stanley Black & Decker, made its European debut at the Schweissen & Schneiden trade fair.

Powered by four DEWALT® FLEXVOLT® 12 Ah (amp-hour) batteries, Renegade VOLT offers an MMA output of 10-130A and TIG output of 10-150 on battery power. Renegade VOLT also connects to 120V/230V AC mains power and provides a maximum welding output of 200A when connected to 230V mains. Additionally, Renegade VOLT has an exclusive AMP + Hybrid Mode that supplements mains power with battery power to mitigate nuisance circuit breaker tripping.

Using the four FLEXVOLT 12 Ah batteries included in the package and set to an output of 80A, the Renegade VOLT provides the power to weld with up to 33, E6013, electrodes or TIG weld for up to 45 minutes on a single charge in standard operating conditions.

The four-port fast charger, that comes included, charges the 12 Ah batteries from zero to full charge in about 100 minutes. Depleted batteries can be swapped for fresh batteries in seconds, so users can continue welding without interruption. The battery box detaches for easier portability and storage, as well as for convenience when connected to mains power. The machine weighs 23 kg with the batteries and battery box and 10 kg when the box is detached.

Portable and powerful

"Renegade VOLT ES 200i revolutionises the industry as the first-ever interchangeable battery-powered welder," says Pedro Muniz, ESAB product marketing director. "Through our collaboration with Stanley Black & Decker, Renegade VOLT offers contractors the benefit of using batteries that work with any other DEWALT FLEXVOLT-compatible hand tools. It allows users to accomplish jobs in difficult-to-reach locations, locations without power and applications where portability and quick setup provide operational efficiencies."

Renegade VOLT is a fraction of the weight and size of engine-driven generators and it eliminates many of the costs and hassles of generators, such as fumes, fuel costs, noise and the need to drag heavy and expensive



welding cables or extension cords. With the ability to use AC mains power to tackle larger projects in the fabrication shop, Renegade VOLT provides ultimate location flexibility. Applications that benefit from Renegade VOLT include maintenance and repair, construction, shipyard, rail, power generation, offshore and farm/agriculture.

Best-of-Class

"Renegade VOLT builds on the success of ESAB's Renegade inverter-based welding platform, which offers best-of-class arc performance to meet the high expectations of welding professionals," says Bartosz Kutarba, global director of Light Industrial Products at ESAB. "Renegade VOLT uses a next-generation current control module with built-in intelligence that can detect and clear a short circuit or manage current transients faster than the microprocessor controls used on other units, minimising spatter and creating a stable, more controllable weld pool."

In MMA mode, Renegade VOLT features include adjustable Hot Start, which fine tunes the optimal energy during the arc starting

sequence for improved strike performance and reduced sticking. An Adjustable Arc Force function enables the operator to adjust the arc characteristics so that they are crisper or softer, tailoring the arc for different electrodes, applications and operator preferences. Preferences can be stored in ten memory functions. In TIG mode, Renegade VOLT provides Live-TIG for arc starts without high-frequency. Users access all TIG and MMA functions from an easy-to-read colour-coded graphical interface.

ESAB is a leader in fabrication technology. For more than 100 years, it has transformed industries built by fabricators, providing complete workflow solutions through its diverse portfolio of products from more than 40 of the most trusted brands in welding and cutting in the world. From industrial demands to repair and maintenance, innovators that shape the world rely on ESAB's portfolio.

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