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XYZ Machine Tools would like to personally invite customers to one of its official launch dates in November of the new ProtoTRAK TMC range.

The latest touchscreen, easy-to-use control is now fully integrated into five of the company's best selling Vertical Machining Centres (VMC). The result is a range of machines with toolchangers that can keep coolant and chips contained within the guarding and, when required, still operate in manual mode with handwheels in X, Y and Z.

This formidable new combination gives levels of programming and production capabilities never realised before. The TMC gives the best of both worlds with easy, agile programming of prototypes or production.

Nigel Atherton, managing director XYZ Machine Tools, says: "This is a game changer, a formidable pairing and a 'must see' for all existing ProtoTRAK users. At XYZ we think the ProtoTRAK TMC is the most versatile and powerful milling package we've ever seen."

Visitors can attend any of the three XYZ showrooms on the dates shown below:

**XYZ - Huddersfield**

Date: Tuesday 15th November

Time: 8.00am - 2.00 pm

Address: Innovation 25, Unit 7, Bradley Business Park, Dyson Wood Way, Huddersfield. HD2 1GN

**XYZ - Nuneaton**

Date: Wednesday 16th November

Time: 8.00 am - 2.00 pm

Address: 5/6 Tungsten Court, Hemdale Business Park, Nuneaton. CV11 6GZ

**XYZ - Devon**

Date: Thursday 17th November

Time: 8.00 am - 2.00 pm

Address: Woodlands Business Park, Burlescombe, Nr Tiverton, Devon. EX16 7LL

By pre-registering, visitors can receive a *free Vernier Caliper*. All guests that attend one of the three UK launch dates will be able to see live demonstrations throughout the day with bacon butties served from 8.00am and lunch from midday.

To see the ProtoTRAK® TMC after the official launch dates call XYZ on 01823 674200 to book your demo at any of the company's six UK showrooms.

**XYZ Machine Tools Tel: 01823 674200**

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# CERATIZIT announces ambitious sustainability strategy

'CO<sub>2</sub> neutral' by 2025, 'net zero' by 2040

CERATIZIT presented its ambitious sustainability strategy during AMB 2022 in Stuttgart. The aim of this strategy is to make the company the leader in sustainability for the hard metal and cutting tool industry by 2025.

Announcing these new and ambitious sustainability goals that will affect and change the entire supply chain, executive board member Thierry Wolter said: "Climate change is one of the greatest challenges of our time and requires the industry to rethink in many areas as well," CERATIZIT has set itself ambitious targets for its own products and services in order to enable customers to also produce more sustainably. He added: "Our vision is to be the leader in sustainability in the hard metal and cutting tool industry by 2025."

In order to be truly sustainable, CERATIZIT will look at the entire value chain with regard to Environmental, Social and Governance criteria (ESG) and work in cooperation with partners. In the first phase, the focus will be on those aspects that have the greatest leverage effect.

In order to drastically reduce its own carbon footprint quickly, CERATIZIT is focusing on three major levers. The first decisive factor is an increase in the use of secondary raw materials to over 95 percent. Compared to primary raw materials from ore, their processing requires 70 percent less energy and reduces CO<sub>2</sub> emissions by 40 percent. A positive side effect is the safeguarding of the supply chain for raw materials, so that both the customers and CERATIZIT benefit twice.

Another focus is on the power supply. CERATIZIT plans to switch the power supply of all sites to green electricity from wind, solar and waterpower in the next few years. Closely related to the change in power supply is the issue of hydrogen supply. It is needed as a production medium in the hard

metal industry, especially to produce tungsten powder. Up to now this hydrogen has mainly been obtained from natural gas by steam reforming, so-called 'grey' hydrogen. In future CERATIZIT plans to use blue hydrogen, which is produced from water by electrolysis with green electricity. For this purpose, CERATIZIT will cooperate with its existing suppliers and build its own electrolysis plants.

The first milestone in the implementation of the new strategy is 2025, by which time CERATIZIT plans not only to be CO<sub>2</sub> neutral, i.e. to offset all emissions along the entire supply chain. The goal is also to reduce the actual emissions by 35 percent compared to the reference year 2020. The second stage, 2030, envisages a reduction of 60 percent compared to 2020 with the help of further measures.

The most ambitious goal, however, is to achieve "net zero" by 2040; a target envisaged by the Paris Climate Agreement only for 2050. "Reducing CO<sub>2</sub> emissions along the entire value chain by at least 75 percent by 2040 is without question a challenge. However, with a view to future generations, we see no alternative to this

path and are pleased to also let our customers participate in this through products such as our "GreenCarbide" rods, our award-winning SilverLine milling cutter with sustainability formula as well as a wide range of services," Thierry Wolter concluded.

For further information on the sustainability strategy visit:

<https://www.ceratizit.com/int/en/sustainability.html>

For over 95 years, CERATIZIT has been a pioneer in developing exceptional hard material solutions for machining and wear protection. The private company, with registered offices in Mamer, Luxembourg, develops and produces highly specialised cutting tools, indexable inserts, rods made from hard materials and wear parts. The CERATIZIT Group is a leader in various application segments and successfully develops new carbide, cermet and ceramic grades, such as for wood and stone working.

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## AXYZ announces incredible offers on the purchase of one of its new routers

As a leading global manufacturer of CNC router machines and knife systems, AXYZ recognises the need for versatility when it comes to cutting systems. Its portfolio of routing machines consists of five different models: Innovator, Infinite, Trident, METALWORKER and PANELBuilder, all with their own unique options and versatility to cross over infinite markets.

The company is excited to announce that its special offer, that started in October, runs to the 30th November. The offer includes 10 percent off all standard AXYZ Routers with: no extra charge two year warranty; no extra charge two year pre-paid maintenance, parts and labour; no extra charge industry specific starter tool kit.

The AXYZ Innovator is optimised for prototype, signs and graphics, woodworking shops and educational institutions. It is equipped with powerful integrated servo motors, an optional tool changer and standard helical rack. Choose from two standard sizes that fit the most common sheets sized for this market.

The Infinite router is a highly configurable CNC machine. This series is suitable for one-off, small batch production as well as



high volume and high productivity applications, including point of purchase, sign making, woodworking, plastic fabrication and so much more.

Processing a wide range of materials requires more than one cutting head. The Trident combines three different cutting technologies to provide maximum versatility by offering a choice of routing spindle and two knives, which can be either tangential, oscillating or a combination of both. Ideal for foam processing, graphics and print finishing, point of purchase and sign making.

Manufacturers looking to process non-ferrous metals in low to high volume manufacturing environments will benefit from a standard list of features that make the METALWORKER CNC router among the leading machines in the market. It is specifically engineered for high precision

part production in nested-based CNC operations, such as metal fabrication, aluminium and metal composites.

The PANELBuilder system is the most sophisticated, all-in-one solution on the market. By combining advanced, easy-to-use software with custom machine design, it processes all types of cladding materials faster, more consistently and at a lower cost than ever before. With its dedicated CAD/CAM software for automated panel fabrication, AXYZ believes it is the world's leading panel fabrication system.

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# Starrag Heckert H55 machining centre gets to grip with die forged hand tools

The use of a Heckert H55 machining centre from Starrag has enabled renowned hand tool manufacturer SWM to not only reduce cutting times by around 40 percent on certain parts, but the new-found flexibility offered by the 4-axis machine is also allowing the Germany-based company to identify new machining concepts there were previously impossible.

Part of the Stahlwille Group, one of Germany's leading hand tool manufacturers, the long-established SWM supplies all its group companies with forged parts for the production of high-quality screwdrivers and gripping tools as well as intelligent torque technology. Die forging is a particular SWM strength and the company's reputation has always been based on expert in-house manufacturing processes using partially automated production lines.

However, SWM recently recognised the potential to optimise the production of its large pliers. Machining was the weak point, the company adjudged, including its use of standardised yet complex fixturing/workholding, rather than the need to increase the level of automation with robots. Clamping of the plier heads was taking too long, as was the milling of these workpieces due to the limited spindle speed available with the existing machinery. This also severely limited product variety and made retooling very time consuming.

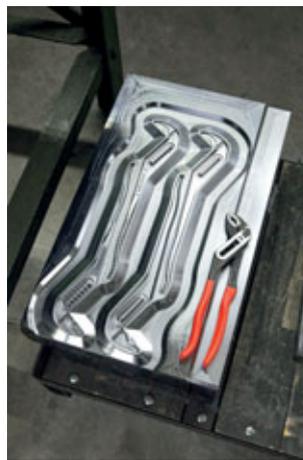
The way to significantly shorten the production process, to 30 seconds per plier head and to minimise the setup times of 26 different workpieces, was to capitalise on the capabilities of a Heckert H55 machining centre. It boasts high levels of rigidity, accuracy, super-fast traverse rates of 80 m/min and an ability to handle loads of 800 kgs on pallets of 500 mm by 500 mm, optionally 500 mm by 630 mm.

Importantly too, the improved machining process also depends on the company utilising in-house designed fixturing on which sometimes four different workpieces can be clamped. SWM undertook its own fixturing design because, says the company, "all the fixture manufacturers we found had little experience with forged parts and the resulting tolerances that fluctuate due to the shrinkage rates that occur during die forging."

But why use such a high-precision machining centre on components where the tolerances are usually only a few tenths of a



mm? In SWM's case, machining accuracy was not the decisive factor. What is important is machine stability, for machining repeatability and flexibility, as well as the need for minimal space requirements. The H55 is a compact machine occupying a floorspace of just 6.8 m by 2.9 m.

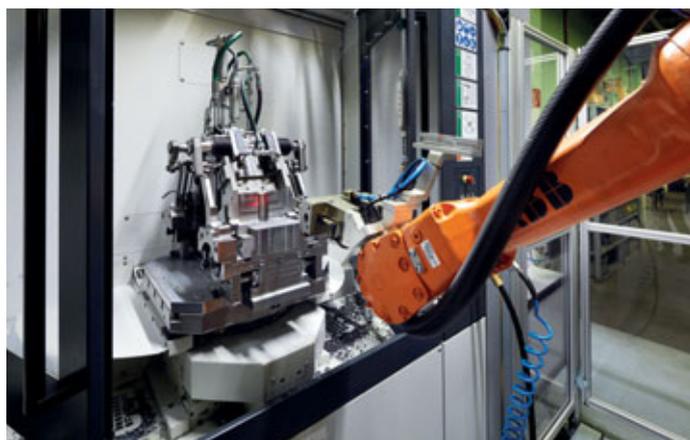


Another example of the benefits to SWM of the Heckert machine concerns certain very large parts that were previously manually machined and took half a shift. Today, because the Heckert table can easily handle the required half-tonne fixture, which can be changed in just over 30 minutes, it enables the company to re-deploy the machinist that was previously required.

The H55's micron accuracy and repeatability are, however, ably illustrated by SWM's need to machine parts on opposite sides, to

be subsequently joined together. The machine's rigid HSK-A100 spindle is also allowing SWM to maximise the performance of its HSS profile cutters and, combined with the in-house fixturing, this means cutting speeds have been increased by around 40 percent. Ongoing investigations into new tooling concepts as well as the programming of 'smart start up strategies' are also identifying the potential for further optimised production routines.

SWM states: "The machining centre is proving a real workhorse, allowing the company to open up countless possibilities and potentially new areas of our portfolio". Such is the success of the Heckert H55 that the company's exciting future is based on investing in a second identical machine.



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The DVF 5000 simultaneous 5-axis machine.

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# Good service leads to repeat sales of horizontal machining centres

When Autocraft Solutions Group, Europe's largest independent engine builder and remanufacturer, purchased the land and assets of an existing but redundant machine shop in Booth Drive, Wellingborough in June 2018, the company retained four existing Heller 4-axis, twin-pallet, Horizontal Machining Centres (HMCs) that were already on site. Within weeks, Autocraft was using them to produce cylinder heads and blocks both for its own engine assembly and for delivery to its customers' production lines on a just-in-time basis. For Autocraft co-owner Mike Hague-Morgan, it was a seminal moment:

"We had always bought other makes of prismatic machining equipment. However, the typical six-day turnaround to source a new spindle from the suppliers meant that we had to carry £500,000 of extra stock of machined parts to ensure continuity of supply to our customers. It was not only costly but took up a lot of floor space.

"Once we started using the Hellers, we saw how quickly they responded to our requests for after-sales service, including the supply of replacement spindles within 24 to 48 hours. It gave us such a high level of confidence that we decided to take all the stock out and purchase additional Heller HMCs to produce more parts, increasing our profitability."



Autocraft produces in medium to low volumes cylinder heads and blocks for a range of three to six cylinder inline and V6 to V12 engines for automotive and off-highway applications. The four Heller H2000 machining centres were soon joined by another three. Then two further orders, each for three more, were placed during the pandemic to bring the total to 13.

Mike Hague-Morgan adds: "During an incredibly difficult trading period, we were still able to grow the business partly because of the service level provided by Heller, not just for the new HMCs we bought but also for the original turnkey package of machines we inherited.

"In addition to rapid spindle replacement when needed, the supplier also provided installation support and sometimes engineering support as well, as we had staff on extended sick leave due to COVID.

"Engineers from Heller came on site and seamlessly slotted in to support our team. That is not an average level of service, for which Heller has to be commended.

"We deliver hundreds of engine blocks per week to major production lines and it costs millions of pounds if they stop, so continuity of supply of heads and blocks is critical. Having machines up and running within a day or two after a spindle failure is worth a huge amount to me."

It is noteworthy that Heller's compact, high torque spindles are produced in-house in a recently-opened, air-conditioned, automated facility at the company's headquarters in Germany. They feature ease of servicing, integrated leakage checking to prevent damage and programmable

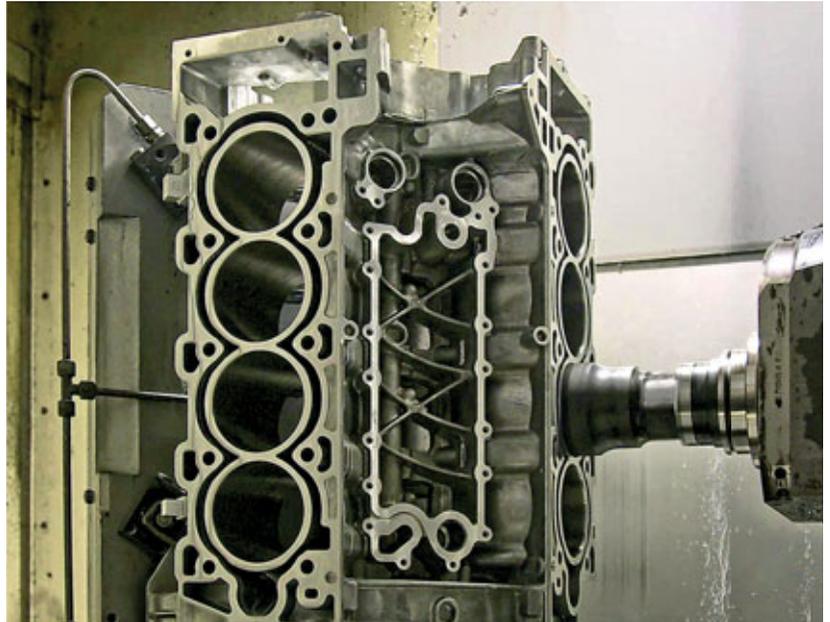


through-coolant up to 70 bar plus rapid run-up times for high productivity.

Although the H2000s in Wellingborough were designed by the parent company, they were manufactured at the group's UK factory in Redditch. Contributing further to maximising output are fast rapid traverse, integral hydraulics for automatically clamping the engine components and air detect for checking that the component is seated correctly. A probe in the tool magazine for identifying broken cutters shaves off further time by removing that function from the cutting cycles. All these features are standard on Hellers, whereas many other machine manufacturers class them as extras, increasing both cost and delivery lead-time.

With more than 400 staff and over £60 million turnover, Autocraft provides an array of engineering services to global automotive OEMs and their supply chains. It helps customers outsource non-core operations, such as offering a fully outsourced Internal Combustion Engine (ICE) solution for manufacturers wanting to move away from in-house engine production, freeing up factory space and personnel to concentrate on Electric Vehicles (EV).

With environmental issues becoming increasingly important, the engine remanufacturing service is becoming ever more popular and the manufacturer also helps its customers to transition from ICE to EV technology. In addition to engine and component production,



Autocraft is a technology leader in the repair, remanufacture and niche volume assembly of EV battery packs and electric drive units.

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The graphic features a central circular diagram with five segments: Services (green), Machines (blue), Digital (red), Automation (yellow), and Know-how (cyan). The word 'HELLER' is prominently displayed in white at the top right. Below the diagram, the text reads 'Complete solutions by HELLER 360° performance for your production'. A QR code is located in the bottom right corner, and the slogan 'HELLER solutions: Knowing how it's done.' is at the bottom.

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# Back on the investment trail with a vengeance

Mills CNC, the exclusive distributor of DN Solutions, formerly Doosan, machine tools and a major automation systems provider to UK and Irish component manufacturers, has recently supplied leading precision subcontract specialist, Lenane Precision Ltd, with a new, best-selling DVF 5000 simultaneous 5-axis machining centre.

The machine, the third DVF 5000 to be acquired by the company in as many years, was delivered and installed at Lenane's modern production facility in Shannon, County Clare in September 2022

The new DVF 5000 has significantly increased the company's machining capacity and capabilities and is being used to machine a range of high-precision, low volume complex components for its aerospace and medical device customers.

These components, made from aluminium, stainless and titanium, are machined to tight tolerances and exacting surface finishes. They are often characterised by their intricate features that can only be machined, or can only be machined economically by using simultaneous 5-axis technology.

Jim Lenane, managing director at Lenane Precision, says: "Machining prototypes and first article components for the highly regulated aerospace and medical sectors mean that there is little room for manoeuvre or discrepancy from product design to production result. Parts need to be right first time, every time."

The new DVF 5000, the first machine tool investment made by the company since the outbreak of the pandemic, is significant for a number of reasons. Firstly, it provides tangible evidence that the aerospace and medical device sectors, severely affected by the pandemic, have now 'bounced back' and that demand from these sectors for high-quality machined components has returned, or is returning, to pre-COVID levels.

It also demonstrates, unequivocally, that Lenane's commitment to continuous improvement and its attendant investment strategies, designed to improve and upgrade its plant and equipment as well as its processes and systems, are now being implemented by the company with renewed vigour. Although currently operating as a standalone machine, the latest DVF 5000 investment should not and cannot be seen in isolation.

Jim Lenane explains: "The new DVF 5000 has been deliberately positioned adjacent to the flexible automated manufacturing cell that was delivered and installed in March 2020. The new DVF 5000 complements and works in tandem with the cell."

The automated cell, a sophisticated, complex and modular turnkey solution designed by Lenane in conjunction with Mills CNC, comprises two DVF 5000 machining centres and a FANUC industrial robot integrated by a robot positioning track that runs between both machines to enable fast, efficient and reliable part

loading and unloading operations to occur.

Other elements of the cell include an integrated racking system, holding up to 36 x pallets, 400 mm x 400 mm, each with a 140 kg maximum load, onto which workpieces are set up and clamped prior to loading into the DVF 5000 machines. Also, after machining operations are completed, machined components are stacked and stored.

The cell is driven and controlled by Mills CNC's proprietary SYNERGi software which, with its touchscreen HMI, provides a seamless interface between the machines and robot.

James Ryan, Lenane Precision's production manager says: "The cell has significantly increased our productivity, process efficiencies and competitiveness. It is used to machine production parts that often have long cycle times and, as a consequence, operates around the clock, currently 24/6.

"We aim to get 20 hours machining operation from the cell every day from Monday to Saturday. The remaining four hours per day are used for setup operations i.e., cleaning and maintaining the machines, replacing fixtures and tooling. The cell, incorporating advanced 5-axis machining technology, has more than justified the investment made in acquiring it."

However, with business returning to pre-pandemic levels and with Lenane's machining capabilities in high demand from new and existing customers, some



production bottlenecks were becoming evident. These bottlenecks were mainly concerned with the most effective and efficient way of machining prototypes and First Article components.

James Ryan continues: "We believed that machining prototypes and pre-production parts, which are required and machined in low volumes using the automated cell, was inefficient and the wrong way to go. If left unchecked, this could compromise the productivity potential of the cell which is designed to handle higher volumes.

"After careful analysis, we determined that a more effective and sustainable solution would be to invest in another 5-axis machine for our development work as this would free-up time on the cell for higher volume batch production."

This decision resulted in the investment in a standalone 5-axis machine. Having already experienced significant productivity gains achieved from investing in 5-axis machine tools, most recently through the two DVF 5000 machining centres and a few years earlier through the acquisition of a large-capacity Doosan VC630-5AX, the decision was made to invest in a third DVF 5000 machine.

James Ryan explains: "The DVF 5000 is an excellent machine. It is fast, accurate and reliable and enables us to machine precision parts to completion in one setup. When it came to investing in another 5-axis machine, the decision was a straightforward one. Depending on future demand and how we organise ourselves to meet it, the new DVF 5000 machine may well be integrated into the cell.

"Such scaling up can be achieved by extending the robot rail so that the Fanuc robot can service three machines and explains why we installed the new DVF 5000 in such close proximity to the cell in the first place."

With a significant proportion of prototype and pre-production work undertaken on the standalone DVF 5000 expected to move into full production in the future, it makes perfect sense, from a process consistency perspective, to integrate the machine into the cell.

The new DVF 5000 is supported by Mills CNC's quick-response after-sales services which, for companies in Ireland, comprises dedicated service and applications engineers based in the Country.

James Ryan concludes: "We will always



need a standalone 5-axis machine for our prototype work and the DVF 5000 meets these needs perfectly.

"The decision to invest in the latest DVF 5000 was based on our positive experience with the two, previously acquired machines and with the long-standing relationship we have with Mills CNC."

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# Merc continues commitment to Nakamura

The aerospace industry has certainly encountered a turbulent period throughout the pandemic. For Tier 1 aerospace suppliers that have invested in flexible multi-tasking machine tools that set the benchmark for others to follow, the hiatus has had less of an impact on business. This is certainly the case for Merc Aerospace. Its pre and post pandemic investment in Nakamura-Tome turning centres from the Engineering Technology Group (ETG) is a testament to why more companies should be investing in this technology.

Prior to the pandemic, Merc Aerospace in Barrowford made a conscious effort to incorporate more 'one-hit' machining technology into its facility. The company initially replaced five older machine tools with two Nakamura WT150IIs as part of its commitment to lean manufacturing, reducing lead times for customers that include Airbus, AgustaWestland, BAE Systems and Bombardier. The sustained investment drive increased orders and subsequently turnover with the 50-employee company reducing costs, setups, lead times and improved throughput with the Nakamura machines.

Merc Aerospace took delivery of its first Nakamura-Tome WT150 IIF twin-spindle twin turret turning centre in October 2017 and it immediately replaced two existing machines while drastically improving productivity. This model was once again adopted when the second WT150 IIF arrived in March 2018.

Like any diligent business that recognises it had hit a 'sweet spot' with its machine tool



investment strategy, the next step was to build on that strategy. The company then took delivery of a twin spindle triple turret Nakamura NTY3-150 multi-axis turning centre in April 2019. With the aerospace industry returning to pre-pandemic levels and Merc being well positioned to support its customers, the company took delivery of a Nakamura AS200LMSY sub-spindle turning centre in 2021 and another in May 2022.

Discussing the investment strategy, Merc Aerospace managing director Richard Meade says: "Historically, we had invested ad hoc in our machine shop and the turning centres on our shop floor were a representation of numerous high-end brands. We developed a strategy for investment and we knew the Nakamura brand had an outstanding reputation and are installed at a lot of prestigious businesses. We looked at several Nakamura machines and the WT150 IIF was the perfect fit. Typically, we machine relatively complex parts from exotic materials that range from 5-off to 100s and our setups could be an hour to days. The WT150 IIF machines changed all this."

Describing the WT150 IIF as 'the perfect utility' machine, Richard Meade adds: "The twin-spindle, twin-turret configuration has been a game changer. It has increased flexibility and throughput and one Nakamura proved 30 percent more productive than the two machines that it replaced. Additionally, we had a range of

sliding head machines that are better suited to higher production runs rather than the batches we run in the hundreds. The Nakamura's wiped out our sliding head machines as the sliders were restricted to diameters well below 50 mm and the setup and changeover times were excessive for our batch sizes."

With the WT150 IIF machines making such an impact at Merc, the company took the next step and opted for the Nakamura NTY3-150, a twin spindle machine with three tooling turrets that can all be engaged simultaneously. Primarily machining fuel injection and gas turbine components, the ability to engage three tool turrets simultaneously has made a tremendous impact. In one of many instances, the NTY3-150 has reduced cycle times from 1 hour 10 minutes on a previous twin-spindle machine to just 35 minutes.

With the passing of the pandemic, business has rapidly picked up at Merc Aerospace with turnover and workload increasing significantly in a short period. With both twin-spindle twin turret and twin-spindle triple turret technology on the shop floor and a swelling order book, Merc needed to invest in more machines. Richard Meade continues: "With the WT150 IIF and NTY3-150 making such a huge impact in our turning department, we naturally turned to ETG and the Nakamura machines once again when we needed more machines to fulfil our growing order book. Already having a great blend of extremely capable



Nakamura machines, we needed machines with even shorter setups that could react to the fluctuation in workload and the type of work that every business encounters. The AS200-LMSY is an extremely nimble machine that can react quickly to our diverse demands. We do a lot of in-service spares work for BAE Systems, producing low volume fast turnaround parts for the Hawk, Harrier and Tornado. The AS200 is perfect for this work. So perfect, we followed the first machine with a second earlier this year. The AS200 provides one-hit machining capability with fast setups, which is ideal for short-run work that is required on short lead times."

Providing an overview of the Nakamura machines, Richard Meade adds: "The guys on the shop floor say the Nakamura's are the best machines that they have ever worked with. That in itself is a testament to the user-friendly and intuitive user interface and construction of the machine. From a build quality perspective, there is virtually no warm-up cycle, unlike our other machine tools. The rigidity and build quality is far superior to other brands on our shop floor and this is also reflected in the Nakamura's requiring less preventative maintenance than other machines and the fact that we rarely need to call out ETG engineers."



Looking at the technology behind the Nakamura machines, the Smart X CNC control panel and software technology is making a considerable impact at Merc Aerospace. The system incorporates features like the 3D Smart Pro AI to analyse tool paths and cutting conditions, the Thermo Navigator for thermal growth compensation, the NT Machine Simulation and Collision Guard. Additionally, the interface incorporates Industry 4.0 technology with factory visualisation, layout, a list of connected machines and machine status.

Looking toward the future, Richard Meade concludes: "The Nakamura machines have an outstanding build quality. The flexibility and capability are second to none and our shop floor team believe they are the best turning centres they have worked with. Additionally, the Smart X interface has a complete Industry 4.0 suite, so we can adopt numerous technologies as the business evolves. We are looking at retrofitting the oscillating cutting cycles on the machines to break chips and prevent swarf from wrapping around the tools or re-cutting, as this will extend our unattended running times."

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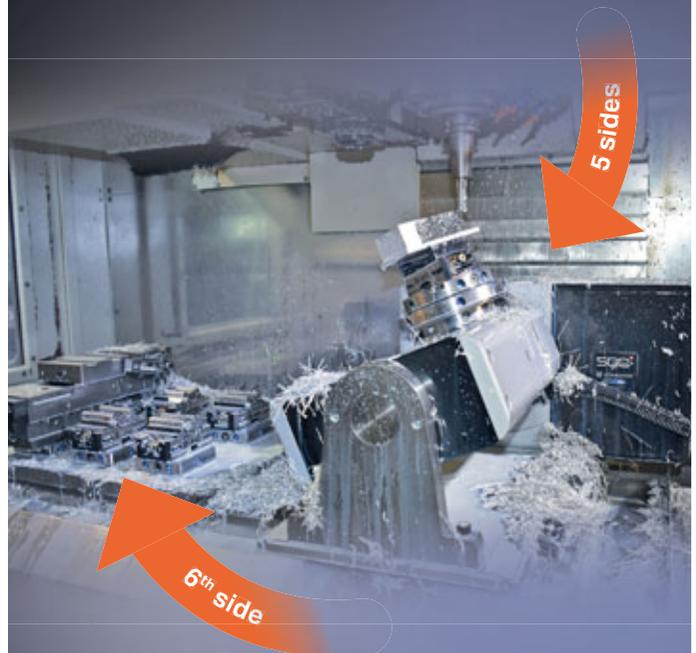
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# Evolution and expansion at XYZ

John Barber caught up with Nigel Atherton, managing director of XYZ Machine Tools over the summer to talk all things XYZ and his career highlights to date



"After a while, the company decided to sell the business and they were moving away from CNC's to continue with their old, manual big lathes. I decided to join a company in Mansfield and then the miner's strike of 1984 unfortunately caused that company's demise. I had a few job opportunities around the country and was offered one working a few days a week in Newton Abbot, Devon. I only ended up working for a short period as the rest of my time was spent rebuilding Bridgeport machines and fitting digital readouts. I was good at selling the retrofits and selling the repairs and decided I might be better off selling them and letting someone else do the hard work! And the rest, as they say, is history. I started XYZ at the ripe old age of 22."

### What were some of your biggest challenges in the early days?

Money! The biggest problem was I had decided to buy two Turret Mills from Taiwan, but I didn't have the money to visit. I thought that when they arrived, I would have to rebuild them. When they arrived, I was absolutely delighted. It's the machinery today that is called the XYZ 2000 Turret Mill. I bought two and sold them straight away, then four and sold them straight away. I couldn't afford a container and the bank wouldn't support me. So, I took on a business partner who was the guy I originally moved down to work for. With his help. I was able to bring over containers. We would receive one shipment a month to start with and within two years, we were selling 65 machines a month on average.

### How has 2022 gone for XYZ?

"MACH, in April was busy, but we had a pre-MACH offer which meant we closed a lot of deals prior to the show. However, MACH resulted in a lot of enquiries going forward and a lot of people wanting to buy machines. We had a really good start to the year with the first three months of our financial year producing just over £9 million in sales compared to £7 million in the same period last year. In 2021 we had a great year too, despite COVID and so we are very pleased.

### I understand you started the company in 1984. Where did your passion for machine tools first start?

"I started in the industry with an apprenticeship at a machine tools company in Halifax called Broadbent Machine Tools. Originally, I wanted to be a draughtsman but after three or four months I really didn't like tracing drawings. The guys on the shop floor were building these big lathes and I thought I would be better off there as I would really like to be building machines. So I became a machine tool fitter which I thoroughly enjoyed and I had ambitions to become a service engineer. As we got involved in CNC, I became very interested in it. Around 1980, I used to play around in my lunch hours with the CNC's and a pen which was spring loaded to do drawings. The MD saw me and asked if I would show people how to use the machines, demonstrate them and train them, which I did. I then gained a strong interest in sales.



### 1993 was a significant year in the company's history with the launch of ProtoTRAK. How revolutionary was this system for machine shops and why does it remain so popular today?

"I first heard about ProtoTRAK two years earlier in 1991. The problem was it seemed to be very expensive, but I heard that it was selling at a rate of 400-500 units a month, in America, which I got very excited about. An American was looking for distributors in Europe and so I invited him to visit. When he showed me a demonstration of it, the speed and simplicity of it blew me away. Within five minutes I made the decision that we should buy this system. In the first eighteen months, I predicted we would sell 12 and we sold 402 units. It became word of mouth, with people ordering multiple units. Although we had some really good

Blue-chip names as our customers, the bulk of our customers in the early days were the guys who were running toolrooms with a dozen Bridgeport's and decided to put a ProtoTRAK on the end of it. Before you knew it, they had three ProtoTRAKs and no manual machine tools.

The beauty of ProtoTRAK is that we can train anyone in a day to use it, even if they have never programmed before. The system will be 30 years old next year and the language of the system has not changed, but what it is capable of doing has increased. The touchscreen has made it even more simple to use. Around 1997, we introduced lathes and today we sell an equal amount of lathes and mills.

### Explain why smaller customers have been so important to XYZ over the years?

Coming from a machine tool service, building and selling background, I know the importance of keeping a machine up and trucking. When we bring in any model of machine, we buy several sets of spares. We don't want to bring in a new model and then not have spare parts for it. It is crucial that we keep that machine running. The fact that we looked after people in the early days and kept them running, this meant that they kept coming back as they knew our brand was trustworthy. There are now companies who bought a Turret mill thirty years ago and today they will buy a 5-axis from us. We still sell to "Fred in the shed," but nowadays the bulk of our business is with customers with less than 50 employees, although we still have plenty of Blue-chip customers.

Something that I also believe is significant is that we have a fair pricing policy. We sell to everyone for the same price."

### XYZ recently opened a showroom in Huddersfield. What is the significance of this new facility for the company and your customers?



"Well, I am a firm believer that people do not want to travel hours to see a machine that they want to buy. They like to travel maybe two hours tops, spend three hours in a showroom and then a couple of hours back and so they have had a nice day out. We have been in Nuneaton for thirty years now and we did have Blackburn but, for a long time now, I have wanted a showroom somewhere along the M62. Huddersfield is perfect as it is right on top of the Pennines, serving East and West of the Pennines. We have closed Blackburn and opened Huddersfield as it is much better located. The showrooms are not only for demonstrations but also for training. We can provide free training on any new or ex demo machine if you visit one of our showrooms. We have just finished build of a New Polish Showroom in Zabrze near Katowice. It will open very soon

and we already have recruited sales and service staff. This is a very exciting development and our first direct venture into Europe."



### Can you share some of your personal highlights during your career with the company?

"One of the things I have really enjoyed has been seeing factories being built as it shows expansion and progression. It is a milestone when you expand a factory and our premises in Tiverton has already been expanded three times with a smaller expansion just finished. New products excite me and it has been fun running the company with such a great team. It's very rare, almost never, that I make a decision without consulting my team. An idea can develop when you talk with others, we see a lot of positive conversations here. We are really good at retaining staff, with many who have worked for the company for twenty years or more.



### Finally, what advice could you give to anyone wanting to start their own machine tools business today?

"I firmly believe that you should always treat customers fairly, sell to them ALL at the same price and always look after them, giving them the best service you can, as you will be rewarded with returning customers. Look after your customers and they will look after you. I also believe you should treat staff with kindness and respect and in return they too will look after the business and customers.

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# Excetek's efficiency can take you further

With the snowballing costs of energy currently affecting UK homes and businesses, the high efficiency and thereby reduced energy consumption of manufacturing equipment has never been more important. For decades, EDM machine tool specialist Excetek has focused its innovation and development on addressing these challenges. From its generators designed to work at peak effectiveness to the ability of the machines to operate for long periods unattended, overnight on lower tariff electricity, Excetek machine tools provide 'more miles per gallon'.



Electro-Discharge Machining (EDM) is an unconventional machining process that can remove, or machine, electrically conductive materials by using thermal energy, melting and partial vaporisation of the workpiece, that is generated by a series of sparks occurring between the electrode and workpiece. The EDM process is often applied to parts made from harder materials in complex shapes, where characteristics such as strength, temperature-resistance, fine surface finish and accurate dimensions are required.

While the process of machining using EDM is governed by the laws of physics, what does differ from one EDM machine tool to the next is the generator technology and the control circuits required to accurately apply the spark. "Excetek has invested considerable resources in both the generator that creates the spark required and the control circuits that ensure it is applied in the most efficient way to the workpiece," states Ian Holbeche, managing director of the exclusive UK and Eire agents for Excetek wire cut, die sinking and hole drilling EDM machines.

He continues: "Excetek's embedded



power system uses Digital Power Management (DPM) technology extensively. Within the Stable Discharge Module it ensures any fluctuations of the incoming power supply do not affect the quality or speed of the EDM process, so any spikes or troughs are smoothed out and a stable, controlled spark is generated at the workpiece interface."

Spark occurs between the workpiece and the closest points of the electrode, which may be a solid form for die sinking, a highly conductive wire for wire cutting or a small diameter rod for hole drilling. The material is removed from both the electrode and workpiece by the spark, creating an increase of the distance between the electrode and the workpiece at that point. This causes the next spark to occur at the next-closest points between the electrode and workpiece. Even though the surfaces have only very minute peaks and valleys, these very small changes of dimension allow the EDM spark to occur between the closest points.

The EDM process has a reputation for creating exceptional surface finishes and the latest Excetek Gplus range of CNC wire EDM machines enhances this even further with a standard machining surface roughness of Ra 0.3 micron and a Super Finish Circuit able to reduce this further to Ra 0.14 micron. Ian Holbeche says: "The gains here are achieved by possibly removing the need for any super-finishing operations, such as grinding, lapping or honing, to obtain the surface characteristics required for the finished part."

The embedded power design allows for real-time feedback of the discharge cutting



status, stabilising the process, and improving cutting speeds and accuracy. It supports further performance benefits such as corner break prevention, intelligent corner control and highspeed working.

"In terms of speed and reliability we know Excetek's automatic wire threading system, that re-feeds the wire at the point of breaking, is one of the best available and it supports unmanned running of the machine tools. However, it is still more efficient to avoid a wire break and the real time sparking control provides quick response feedback that allows cutting conditions to be adjusted to improve efficiency. We know we can increase corner cutting speeds by 35 percent and still reduce the chance of wire breakage by 90 percent thanks to the levels of digital control available," states Ian Holbeche.

It's not just corners that can be cut quicker using Excetek's digitally controller discharge technology. With the digital signal used to detect the discharge density, the CNC control system can calculate the discharge area according to the capacity available and it applies the correct discharge energy, wire tension and water flow to improve speed and accuracy.

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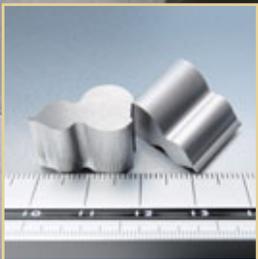
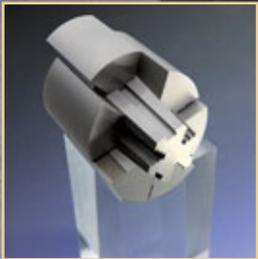
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# JSG Engineering tools up with another Sodick EDM machine

A leading toolmaker has added to its portfolio of Sodick machines with the addition of a new AL40G die-sink model from Sodi-Tech EDM. Hampshire-based JSG Engineering is enjoying long-term success using a range of Sodick EDM wire, die-sink and hole-drill machines that provide high-quality work for the company's customers and help generate repeat business, particularly in the medical/pharmaceutical sector.

Specialising in all aspects of mould tool manufacture, including prototyping, refurbishments and repairs, JSG Engineering has built a strong reputation for 100 percent customer satisfaction. Established in 1990, the family-run business manufactures all types of mould tools, including plastic and rubber injection, rubber compression and transfer tools at its 4000 ft<sup>2</sup> facility in Emsworth, near Portsmouth.

"Business is strong at present, particularly on pharmaceutical side," states director Gary Carpenter. "One customer in particular has been requesting several mould tools as we've progressed through the COVID-19 pandemic."

This demand recently led the company to review its die-sinking capacity. JSG Engineering had some older die-sink machines on site, not Sodick, that were reaching the end of their useful service life.

"We've been buying Sodick machines for the past 25 years and currently have a number on site," says Gary Carpenter. "These machines, which include AQ325L, A530D, AQ45L and K1C models, have been



very reliable for us, so it made sense to look at Sodick again. There's nothing else out there that touches these machines in my opinion."

During a telephone conversation with Sodi-Tech EDM, JSG Engineering learnt that a demonstration model of the Sodick AL40G die-sink model would be on display at the recent MACH 2022 exhibition, so Gary Carpenter expressed his interest. It was not long before the machine was undergoing installation at the company's Emsworth facility.

The AL40G die-sink EDM incorporates Sodick's latest SP controller with Smart Pulse generator. Featuring linear motors and absolute linear scales in the X, Y and Z axes, the machine comes with a 10-year guarantee on positioning accuracy.

At JSG Engineering, the Sodick AL40G sparks tools from materials that include everything from aluminium and P20 steel, through to fully hardened tool steel. A notable job involves the production of mould tool inserts made from tool steel that produce plastic pharmaceutical clamps for use in drug production processes. Due to the

complexity of the clamps, a number of manufacturing processes are required, including EDM and grinding.

"Some of the tools we produce are up to three times faster to produce on our AL40G than our previous die-sink resource," says Gary Carpenter. "The quality is also far better and we can achieve a mirror finish if required. Where before we would have to polish a cavity after sparking, now there's no need for 90 percent of our jobs, so it's saved an awful lot of time."

Energy efficiency is another benefit, particularly in the current inflationary environment for electricity, where manufacturers are having to find ways of offsetting the cost burden.

Says Gary Carpenter: "The fact that the latest Sodick technology is energy-efficient and so fast with its linear technology means that we definitely save on our bills."

A further plus point for JSG Engineering is the inherent ease-of-use that comes with Sodick EDM machines.

"We've had a lot of experience with Sodick machines and always found them easy to learn, even with the evolution of controls over the years," explains Gary Carpenter. "The training package is excellent. My youngest son was at Sodi-Tech last week for some training. When he came back he knew things that even I didn't know. Anything that helps to alleviate the skills shortage is welcome, particularly in the toolmaking sector. Good toolmakers are very hard to come by."

JSG Engineering clearly has its finger on the pulse when it comes to combatting market challenges such as rising energy costs and the skills shortage, thanks in some ways to its ongoing preference for Sodick EDM machines. This strategy has also led to ongoing repeat business from the many industries that the company serves, which aside from medical/pharmaceutical include defence, aerospace, nuclear, electronics, construction, automotive and marine.

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## Fit for the future

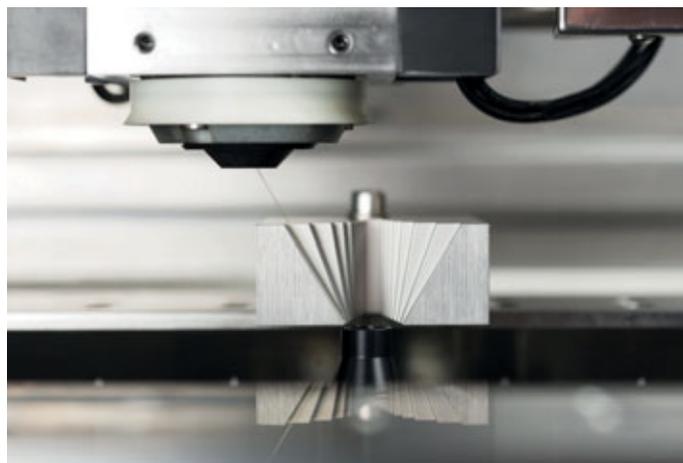
GF Machining Solutions has over 60 years of experience designing and building best-in-class EDM machines. Over this time the company has developed unrivalled expertise producing new and innovative machines with features that push EDM technology to its limits and enable customers to make precision parts and mould inserts faster, better and cheaper. To help future-proof existing machines, out in the field, the company has also developed several upgrades that enable customers to up-their game and remain competitive.

These upgrades relate to the company's CUT C, E and P wire EDM ranges and help improve the machines' performance and increase their functionality, autonomy and process reliability.

With the Turbo Tech upgrade, customers can improve their processes and achieve higher quality and productivity. By applying the upgrade, the machine is provided with an additional technology priorities option, which is the perfect compromise between speed and accuracy in good or bad flushing conditions.

Productivity can increase from 10 percent to 40 percent, depending on the geometry of the part and the flushing conditions experienced. The Turbo Tech module is available for steel cutting with different wire types and diameters. Its combination of faster machining and lower wire consumption provides a sustainable, state-of-the-art technology solution that improves performance and reduces consumable costs.

If a customer needs additional functionality, they can update their machine with the Taper Expert upgrade which enables large taper



parts to be machined. A long-term goal for many customers is to ensure a secure working environment and to increase the lifetime of their equipment. An upgrade, linked to Windows 10, allows customers to keep their equipment running on the highest security levels and standards safe from hacking and malware attacks.

The machines remain up-to-date and benefit from future security developments and the latest software updates and improvements, while staying connected to rConnect, GF Machining Solutions' digital solution designed for monitoring the status of the machine.

If customers have multiple machines and upgrade them, their machine park will remain at the same operating level.

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# Superiority of EDM control system convinces mouldmaker to standardise on Makino

Established over 30 years ago, mouldmaker BM Injection operates from a 10,000 sq ft manufacturing facility in Whitchurch, Hampshire. Out of every ten moulds produced, eight are used for on-site production of injection moulded plastic products for numerous sectors including aerospace, automotive, domestic appliance, sports, safety, optics and transportation.

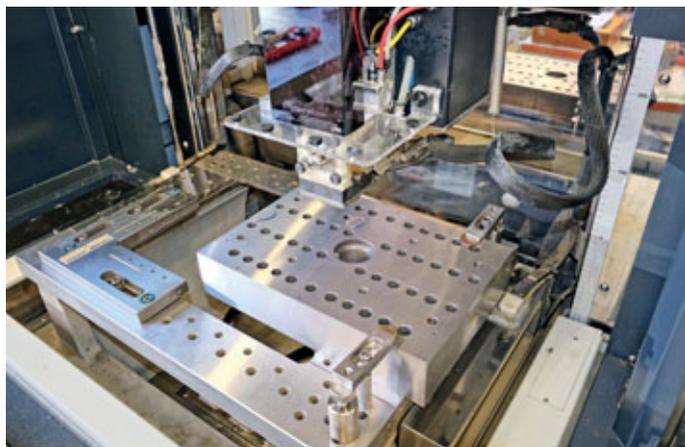
Before it is complete and ready for use, every mould has to visit both a die-sink and a wire-cut Electric Discharge Machine (EDM) as well as a machining centre for hard milling. The proportion of time spent on each machine varies. In the production of BM Injection's mould tools, unless any are hard-milled on an Okuma 3-axis machining centre on-site, all three production platforms used for manufacturing the moulds were built by Makino in Japan and supplied through sole UK agent NCMT.

The latest to be installed in May 2022 was a U32j wire EDM machine fitted with the same Hyper-i control system as a Makino EDAF3 H.E.A.T. EDM die-sinker that arrived in 2019, at the same time as a Makino D200Z 5-axis machining centre from the same Japanese source.

The Hyper-i Windows-based, twin-touch-screen CNC system, with an intuitive interface similar to that found on tablets and smartphones, includes advanced functions to support operators of all skill levels at every step of the machining process. The control contains an extensive library of cutting conditions that automatically optimises the erosion process, even for sealed and poor flush applications. It also enables easy access to and selection of power settings to produce accurate results in the fastest possible cycle times.

The control employs HyperCut technology, a process developed by Makino to produce surface finishes as fine as 3 µm Rz in standard tool steels in a three- or four-pass process. The machine ordered by Mark Combes, a director of BM Injection, was a high-accuracy package with 0.05-micron scale feedback capable of producing extremely smooth surfaces down to 0.7 µm Ra if a seven-pass process is adopted.

He says: "With a wire machine it is all about producing sharp radii and smooth surfaces, especially on the interior of ejector pin holes. That is exactly what the U32j has produced right from the start due



to a combination of rigid machine build, thermal stability and the Hyper-i control. We knew this software would deliver, as it proved fantastic on the EDAF3 sparker we installed three years ago."

Of particular note is the bidirectional HyperConnect Industry 4.0 network connectivity for remote machine monitoring and interlinking of all manufacturing information. This standard software allows access via the cloud to BM Injection's Open Mind OPTICAM wire EDM computer-aided manufacturing software. The CAD/CAM information occupies the top monitor of the twin-screen control and can be viewed and operated as if it were on-board, while Makino's process control screen occupies the lower monitor.

Another feature worthy of mention is the standard CRYSTAL II machining functionality built into the Hyper-i control, which is effective for machining shapes that are hard to polish while enhancing surface finish for improved mould release. It requires no special insulated jigs and is performed with uncoated wire, Bedra brass wire of 0.25 mm diameter with a high zinc content being the standard consumable at the Whitchurch facility.

The U32j is capable of utilising wire down to 0.07 mm diameter, however, smaller than most machines are able to accommodate. There will be a need for smaller gauges and the accompanying diamond guides for the future production of BM Injection's optical industry moulds. Mark Combes points to a reduction in wire consumption coupled with an increase in cutting speed on every job completed so far on the U32j compared with the nearly 20-year-old wire-cut EDM machine that was replaced.

He continues: "When the time came to install new, modern wire EDM technology, we looked at a number of options. We decided again in favour of the Makino offering not only because of the control and its synergy with our die-sink CNC system, but also due to the U32j's impressive working volume, 370 x 270 x 220 mm, for the footprint, 2,580 x 3,165 mm. We get a very compact machine while gaining an extra 20 mm of travel in X, Y and Z."

He was also impressed with the user-friendly, fixed-table, rise-and-fall tank design, which gives access on three sides for efficient loading and unloading of components and for easy

cleaning and maintenance. Reliable unattended running is achieved throughout the night and into the next day, depending on the cycle, helped in part by the effective, automatic, jet-less wire rethreading system. It uses the X, Y, U and V axes to hunt unerringly for an optimum cutting restart position with the wire clear of the workpiece surface.

Another effective technology from Makino is the Protech galvanic protection option, enabling the prevention of rusting and oxidation of steel, carbide and aluminium. By placing an electrode plate in the bottom of the tank and giving it a positive charge, ensuring that the workpiece is held at a negative potential constantly attracts the positive ions and prevents oxidation.

Mark Combes concludes: "Makino is an excellent product but equally important to us is after-sales service. We have always received good back-up from NCMT ever since they delivered, installed and commissioned an Okuma 3-axis vertical machining centre in 2016.

"Extensive product knowledge and being able to impart it to our operators during training is even more crucial with EDM technology. Unless parameters are kept within close limits, machining efficiency can fall off quite quickly. It is important our staff know how to keep an eye on this.

"NCMT's engineers provided a week's instruction at the outset and are always available online or at the end of a telephone for troubleshooting or if technical advice is needed."

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## Press play and walk away

As an industry-leading design, development, test and production facility for Additively Manufactured (AM) products, Alloyed Ltd recently encountered challenges with its supporting EDM machining processes. As a company at the cutting-edge of technology, the Stone based business turned to the Engineering Technology Group (ETG) and its Mitsubishi EDM solution.

The search for a new EDM solution was already underway when Dr Stephen McCain, the machine and systems manager at Alloyed got engaged in the process. "Our team were already considering a replacement EDM machine. At the same time, we became involved in a project to evolve a concept through to production. With an opportunity to manufacture Titanium 64 AM parts on a production scale, we started asking subcontract manufacturers with wire EDM capacity to see if they could cut details on the thin-walled parts as well as cut them from the base blocks. This was a trial in the

capabilities of their EDM machines more than individual skillsets. Speaking to subcontractors with a wide array of EDM technology who were floundering with the intricacies of the part, we quickly realised what machines were incapable of meeting our needs. We found the Engineering Technology Group (ETG) and its Mitsubishi EDM solutions. Its experts provided us with a solution to meet all of our needs."

Alloyed spoke to ETG's resident EDM expert Scott Elsmere and the Mitsubishi MV2400S Type II wire EDM was identified as the perfect choice for the business. Working with an existing EDM machine that required G-Code programming, a skillset that was thin on the ground in this fast-paced high-tech business, Alloyed wanted a machine with incredible ease-of-use. The new MV2400S EDM that was ordered in April and delivered in May incorporates



Mitsubishi's intuitive AD Series CAD/CAM system, a feature that has instantly slashed programming times.

One of the biggest savings for Alloyed is eliminating manual intervention that was continuously required to re-thread the wire each time it broke as each re-thread would take between 5 to 15 minutes.

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# Subcontractor more than doubles turnover by making proprietary threaded components

In 2006, entrepreneur David Swaffield started his own contract machining firm, DWS Engineering, in Crewkerne after gaining a mechanical engineering apprenticeship at a nearby packaging machinery manufacturer. He started out using manual machine tools, progressing to CNC prismatic machining in 2009 and fixed-head CNC turning the year after.

Frustrated at not being able to find pre-war British Standard Whitworth threaded nuts, bolts and other components for the family-owned 1923 Aveling and Porter eight-tonne steam roller he was refurbishing, he decided to make them himself, leading to the inauguration in 2017 of another company, Historic Threads. It was then that David Swaffield discovered the capabilities and production potential of CNC sliding-head lathes from Citizen Machinery.

During the Second World War, the diameters of Whitworth threads were reduced to save metal. It is easy to obtain the later sizes, but the original larger varieties used to be scarce and difficult to source. That was until David Swaffield identified a business opportunity through his subcontracting activities and via Facebook groups run by steam-driven vehicle enthusiasts.



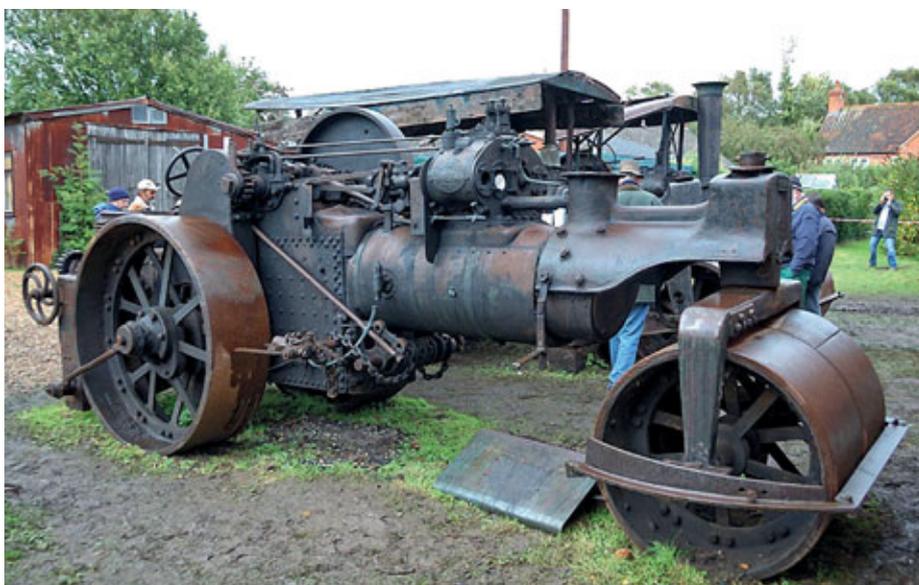
Now a vast range of legacy threaded components, from the biggest Whitworth to the smallest BA (British Association) size and everything in between, is manufactured by Historic Threads and sold on its website [www.historicthreads.co.uk](http://www.historicthreads.co.uk). This business now accounts for 60 percent of David Swaffield's turnover. Despite its recent inception, the company is probably the largest stockist and supplier of pre-WWII threaded components in the world.

Although nuts, bolts, studs and pillars

tend to have a small length-to-diameter ratio and can be satisfactorily produced on fixed-head lathes, David Swaffield learnt early on in his career of the benefits of sliding-head turning, namely that the gang tooling allows short parts to be produced faster and the lathes are additionally capable of turning shaft-type parts if required. His father-in-law owned a subcontracting company half an hour's drive away on the south coast of England and he was a prolific user of Citizen Cincom sliding-head capacity.

In 2017, the first Cincom L32 purchased second-hand from Citizen Machinery was delivered to Crewkerne. The 2001 machine was installed, levelled and aligned the next day by a Citizen engineer and is still producing thousands of nut and bolts every week, albeit of low complexity due to the machine's lack of driven tooling. It was recognised that in-cycle milling and other prismatic operations would be useful for machining more complicated components in one hit, so a second-hand Cincom M32 of a similar age with live tools arrived in March 2021.

As with most sliding-head lathes, the Cincoms are capable of producing components from bar up to 32 mm diameter, so a fixed-head bar-fed lathe of



65 mm capacity was purchased from another source for manufacturing the larger sizes of historic nuts and bolts.

Then in March this year, due to the steep rise in demand worldwide for the legacy threaded components, a third sliding-head lathe was installed, this time a new Cincom L32-VIII LFV. The modern machine design has advantages in that it has been supplied with an expansion kit to enable the nominal 32 mm bar size to be increased to 38 mm, allowing for instance a 3/4-inch nut to be turned from round bar.

An additional advantage is that the guide bush assembly can be removed in an hour to produce in fixed-head mode relatively short components that do not require sliding-head turning. Remnant lengths are substantially shorter, reducing material wastage and costs.

Shortly after the machine was delivered, David Swaffield received DWS Engineering's biggest ever single order for the supply of brass, aluminium and stainless steel parts from 10 to 20 mm in diameter for use in the assembly of make-up brushes and pencils.

The latest Cincom is ideal for fulfilling this contract. For example, the Low Frequency



Vibration (LFV) chipbreaking software built in to the control is able to avoid stringy swarf when drilling a 100 mm long, 8.5 mm diameter hole down the centre of a 10 mm diameter stainless steel pencil, even though the machine is not fitted with optional high pressure coolant.

LFV is also proving useful in avoiding birds-nesting when producing plastic components, such as a batch of 2,000-off, 20 mm diameter black Delrin spacers that went through the shop recently.

The chipbreaking function is programmable, so it can be switched on and off by G-code in the cutting cycle. It may therefore be stopped during parts of the cycle where it is not needed, avoiding the slight material removal rate penalty due to the short periods of air cutting when the tool

tip oscillates away from the component surface to break the swarf into short chips. Users tend to employ LFV differently to suit their requirements; David Swaffield always makes sure it is switched on during parting-off, for example, as it results in a big increase in the life of the indexable inserts.

The chipbreaking function on the latest Cincom is also proving useful for producing in one hit, in a four-minute cycle various EN16 stems for six sizes of patent-pending staple driver. David Swaffield invented this while he was bored during the 2020 lockdown.

LFV provides more latitude when selecting feeds and speeds, as even EN16 can generate stringy swarf unless parameters are set exactly. This new side to the business, [www.stapledriver.co.uk](http://www.stapledriver.co.uk), looks set to generate further significant sales revenue. In addition to being sold online, Mole Valley Farmers is stocking the product on a trial basis in 10 of its 55 stores around the country.

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# Lock, stock and two smoking pallets

Henry Squire & Sons Ltd was founded in 1780 and there are very few manufacturing businesses with a heritage that dates beyond the company that started out making padlocks and cabinet locks. Almost 250 years later, the company based in Wolverhampton is in a state-of-the-art 32,185sq/ft facility, manufacturing security devices and locks for the modern era.

Eight generations and almost a quarter of a century later, the West Midlands company is still family run. It supplied the British Army during the Napoleonic wars, is responsible for the world's first heavy-duty combination locks and it is undoubtedly the world's most experienced lock maker. As the company has grown and expanded, so has its production requirements. It is here that Dugard has stepped up to support this great British brand.

While Dugard may not have been conceived in the 1700s, the South Coast machine tool experts also have a rich pedigree and it supplied its first machine to Henry Squire & Sons Ltd, a Dugard Eagle 1000 more than 20 years ago. "We have a long relationship with Dugard and complete access to their support and service team. As a business, we major on padlock design and manufacture, essentially, we are not machine tool or CNC experts. So, when we need that additional help we will turn to the experts at Dugard," says Glyn Green from Henry Squire & Sons Ltd.

He continues: "Previously our lock manufacturing was undertaken on a machining centre, but this was giving us



issues with capacity and costs. Now, we have invested in a range of new Dugard RMV700 APC twin pallet machines. When you come across twin pallet machines in the industry, they often tend to be horizontal machines that are far more expensive than a vertical machine. For the price of the horizontal twin pallet machine, we can get two vertical twin pallet machining centres on the shop floor making padlocks for us."

From a specification perspective, the impressive Dugard RMV700 APC twin pallet VMC has an X-, Y- and Z-axis of 700 by 400 by 400 mm with two 700 by 400 mm revolving twin pallets. The pallets can accommodate loads up to 160 kg and they rotate a full 180° in two seconds. With a choice of HSK63A or BT40 spindle taper, the impressive machines have a spindle speed up to 12,000 rpm with a powerful 15 kW spindle motor that generates high levels of torque for heavy-duty machining.

The investment in two Dugard RMV700 APC twin pallet vertical machining centres has doubled productivity for Squire & Sons. Looking at the investment decision, Glyn Green continues: "We looked at cycle times for our products on various machines and what excited us about the Dugard machine was the unique Z-axis that rises up at the same time and speed that the head descends. That effectively doubles the Z-axis rapid rate and helps to give us an even quicker cycle time. This results in more padlocks per day being produced.

"The Dugard APC has a whopping 40 station tool turret and that helps us a great



deal as we can cut down the tool changes and the time that the guys spend stripping the machine down and doing changeovers. We may be the new facility, but that does not mean we have acres of space to play with. The relatively small footprint of the Dugard RMV700 APC means that we can move them around our facility to suit the needs of our business. By the end of 2022, we will have six twin pallet machines that will help us manufacture padlocks and bicycle locks. We have to keep the spindles running and Dugard twin pallet machines are the answer to that," concludes Glyn Green.

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## Subcontracting start-up aims to plug 5-axis capacity shortage

A new subcontract manufacturing start-up is aiming to help plug the UK's 5-axis capacity shortage with a state-of-the-art machine manufactured by one of his former employers.

Jonathan Butler has set up Butler Precision Engineering, based in Netherton near Dudley in the West Midlands, with the help of a Mazak VARIAXIS C-600 5-axis machining centre.

"It's been a longstanding ambition to run my own precision machining company and there has never been a better time to make the plunge. There is a real gap in the market for 5-axis capability due to limited machining capacity in the UK, which lead to too much work chasing too few available machining hours. My hope is that Butler Precision Engineering and the VARIAXIS can help plug the gap."

After being operational for only a few weeks, Butler Engineering has already secured two contracts for turbine blade work and medical equipment. Jonathan Butler explains: "We're getting a lot of interest, particularly from customers who want to use us as a development shop or for prototype work, which is perfect for the VARIAXIS."

Jonathan Butler has thirty years' experience in engineering including time with Renault Formula 1 as a machinist and programmer, as a machine shop manager for a fabrication company and, most recently, as an engineering consultant for Quickgrind, travelling around the world offering advice on tooling and programming strategies.

During his time with Mazak, he learned all about the VARIAXIS i-600 machine, the forerunner to the C-600, as an application engineer: "It was my job to know the VARIAXIS like the back of my hand, so when I decided to take the plunge and set up my own business there was only going to be one machine that I wanted. You've got to know and trust the technology you're working with."

The VARIAXIS C-600 is designed for high accuracy machining of components. His machine is equipped with Hypermill programming, Quickgrind tooling and Renishaw Set and Inspect software.

Jonathan Butler concludes: "Other machines can do a job, but it's important for our customers that we get it right first time and that meant going for the best technology available. When you are looking



to break into sectors like motorsport, aerospace, medical and die and mould work you must be able to guarantee the highest levels of accuracy."

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## Popular lathe redesigned for increased functionality

For more than 25 years, German lathe manufacturer INDEX has produced and sold worldwide more than 3,000 ABC twin-spindle, twin-turret turning centres, including many into the UK and Irish markets through sole sales and service agent Kingsbury.

The fixed-headstock, 65 mm capacity, CNC bar auto has undergone a series of improvements that allow it to address more efficiently today's requirement to machine more complex components in smaller batch sizes. The new model occupies an identical footprint and the working area is essentially the same as before. The latter is especially important to meet the needs of current ABC users by ensuring that existing part programs run without any increase in cycle time or loss in machining quality.

Over the years, the robust, slant-bed lathe has seen ongoing improvements including to the control and drives. With the latest revision, a notable upgrade is that the upper live tool carrier has gained Y-axis movement

and may be indexed continuously via a stepless gearbox, opening up many more machining possibilities.

Additionally, the turret has centre height adjustment and can be equipped with double toolholders in seven stations for more comprehensive machining of the front end of components in the 27 kW / 6,000 rpm main spindle using up to 14 static or driven tools.

An eighth position in the top turret houses a 4,500 rpm synchronous spindle for reverse endworking on a parted-off component in conjunction with five tools, two of which may be live, in a backworking attachment mounted on the headstock.

Back endworking may be performed simultaneously with axial front-end machining of a part's internal diameter in the main spindle with one of the upper turret tools, and also with longitudinal machining of the Outside Diameter (OD) using the lower 6-station tool turret, in which all positions are also live. In this way,



three tools can be in cut at the same time for completing combinations of drilling, boring, OD turning, facing and milling, leading to very high levels of productivity.

Control is either by a Siemens S840D sl with INDEX's own Industry 4.0 iXpanel, or by a FANUC 31i-B, ideal for OEMs and subcontractors already using Fanuc CNC systems on their shop floors.

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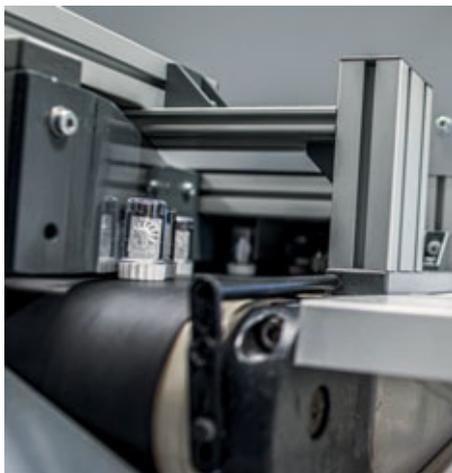
# Making sense of medical GMP machine qualifications & validations

The lines between medical machine qualification and validation are frequently blurred. Despite its dizzying complexity with countless integral pieces that need to slot into place, it's a high-stake process that's reliant on input from numerous industry stakeholders. Yet, this risks over specifying manufacturing aberrations, often leading to nonsensical decisions that retrospectively should never have been documented in the first place during the machine design phase. At some point pragmatism has to step forward and override bureaucracy.

Medical business development director at Sumitomo (SHI) Demag Anatol Sattel assembles the company's very best qualification and validation experts, including medical sales director Andrew Sargisson, project manager Erik Schalle and UK medical sales specialist Sam Carr to reassure and describe how their teams work collaboratively with medical customers to support the entire validation process.

### Where does machine qualification fit into the validation process on medical applications?

As a machinery manufacturer, qualification relates specifically to the equipment and instruments that have been scoped out in the GMP project design specification documentation. This design documentation is effectively the contract that states what will be delivered and the qualification issued by Sumitomo (SHI) Demag before it is released ascertains that the moulding machine meets the user requirements



specifications and the design/functional specifications.

Validation is verifying the complete manufacturing process, including reproducibility of components, batch-to-batch. This is performed externally by the customer themselves or specialist consultants appointed by medical device and component manufacturers.

Qualification forms part of the overarching Validation Masterplan (VMP). However, it's just one of the verticals that feeds into the wider validation process. The most common misconception is believing that our professionals at Sumitomo (SHI) Demag can validate processes. We don't. We can only help customers by qualifying the equipment sold against the defined parameters specified. However, we can make the entire Validation process easier for customers by providing high quality consultancy at the outset of any project, drawing in all stakeholders when scoping out the machine design and User Requirements Specifications (URS). This helps to avoid over-specifying equipment or providing machinery that will never meet the processing tolerance requirements.

### Why is there such an emphasis on documentation?

Predominantly due to the liability risks. Legally, customers cannot hold the machinery suppliers liable. So, understandably, those who take on the task of bringing products to market want to 'cover their backs' legally. Resulting in a lot of written requirements being sourced from suppliers.

In our experience, European customers fall into one of two camps. Those that are highly competent in GMP qualification and validation and have set URS, functionality specification and validation documentation methodologies that they follow from beginning to end. Conversely, the other segment needs more handholding throughout the entire process. They may be entering new markets and consequently ask for everything. Even features that aren't needed.

As impartial yet experienced medical consultants, Sumitomo (SHI) Demag can

customise support to complement in-house resources. This can include adapting tried and tested documentation blueprints to scope out URS, artwork design, software and functional specifications. These files all have transportable sections, which can be tailored to each medical application a machine is being commissioned for.

### What advice can you offer to help streamline documentation processes?

There are no qualification or validation shortcuts. And with no standardised GMP documentation formats to follow, there are always subtle style differences. Yet, it's good practice to keep this documentation as tight as possible, ensuring the content is unambiguous. Detailed but of a manageable size, without deviating from the original design qualification.

Medical manufacturers that create their own GMP documentations benefit from having a consistent tool to track the qualification of all associated equipment, including mould tools and automation solutions. This makes it much easier to manage defined steps for design, installation, operational and production qualifications and validations.

### Why are preliminary definitions so critical?

It may seem blindingly obvious, but you cannot test or validate against something that hasn't been defined at the outset. The URS underpins the design qualification. Listing every element, the assigned authorised expert must state that every requirement can be fulfilled or present an alternative option. Without the URS, you cannot progress to GMP documentation.

The URS is always used by our engineers to define the machine layout. Medical customers use it for validation, verifying that the injection moulding machine is equipped as defined at the preliminary stage and is working as expected.

Customers that cannot determine their needs can always draw upon our pool of medical experts to populate a document with the design detail. This consultancy support gives a level of transparency to all parties, helping to circumvent renegotiations later down the project line.

Having a defined structure also enhances the overall production quality. It's a real value-added service.

## How is GMP qualification documentation delivered?

It's a large paperwork file despatched with every medical injection moulding machine. The signatures are of great importance. How the GMP documentation is signed and dated is tightly regulated, even down to the preferred ink used. Even if all the documentation is correct, if the signature requirements haven't been adhered to, e.g. someone else has signed on your behalf, the qualification documentation is of no value to the customer. Regardless of the product quality and the processing quality, the medical product cannot be sold on the market if any part of this documentation is omitted.

Sumitomo (SHI) Demag medical machine qualification files are signed and sent from the location where the machine order was fulfilled. For our machines, that's Germany or China. However, like most global organisations, we are transitioning to digital files in alignment with production capabilities.

## Who should input to URS documentation and SATs?

All members of the production team who possess an in-depth knowledge of processing should provide the initial input. Ensuring the machine commissioned will produce medical components of the specified quality and integrity. Notably, the same people should not be used to conduct



the Site Acceptance Tests. It's always deemed more robust if an impartial scientific or engineering-based professional who makes no inherent assumptions about machine performance undertakes SATs.

Our medical team can provide support and guidance right up until the SAT. Once configured with the mould tooling, automation and other periphery equipment, the customer assumes overall responsibility for the production cell. At that point everything should have been checked with regard to the material influences and how the moulding machine performs.

## Do machinery manufacturers have a responsibility to 'red flag' impossible processing requests?

Absolutely. This is of the greatest value to customers. Unrealistic processing decisions should be challenged at the earliest phase



by the sales team, drawing in expertise when required. This prevents lengthy delays to time-critical projects.

Out of regulatory fear, people may submit a URS request that is completely unattainable and frankly mostly unwarranted for the medical component being made. For example, the repercussions of asking for +/-5 micron tolerance in a one dimensional plastic part can increase costs tenfold or more. That's a challenging processing window, and unlikely justifiable. Realistically, the person requesting this has little comprehension of the time delay or cost ramifications, which inevitably passes down the chain.

Bringing clarity to requests of this nature can save medical manufacturers millions. With 15 globally trained and cross departmental medical experts, our team is confident intervening at the earliest phase to ensure any nonsensical requests when not critical to the performance of the end product, are scaled right back.

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# Connectivity: optimised for the digital age

By Tom Bouchier, managing director of FANUC UK



To remain competitive, manufacturers in the medical industry need to produce more goods, to higher quality, in less time. This is hard to achieve with human personnel alone, especially given the current skills shortage. The way to resolve these pressures is through automation, using robots to do the monotonous and dangerous jobs and freeing up workers to complete more value-added tasks.

Although the UK was slow to the robotics revolution compared to many other industrialised nations, robotics and automation specialist FANUC UK is reporting a significant uplift in enquiries across the UK and Ireland and especially from SMEs who have not, historically, been major users of automation. One of the factors helping to make automation a more attractive option than ever before is connectivity.



### Driven by data

Machine tools and robots are becoming more intelligent. Industry 4.0 means that all devices in the factory are interconnected. An inevitable consequence of this is a trend towards standardisation of CNC applications across a range of manufacturing technologies. At the same time, availability of data from machines in operation, in real

time, is helping to improve quality, reduce unscheduled stoppages and boost productivity. These things are in reach of even smaller companies.

### Digital twins

Digital twinning is another trend that is proving beneficial to larger and smaller medical manufacturers alike. Developed in conjunction with a physical system, the digital twin can help firms that are looking to scale up, alter or enhance their production lines. By running a virtual version of any changes through the digital twin, they can have confidence that their automated system can handle them before investing in any new equipment, boosting uptime and eliminating the risk of ending up with a system that is not fit for purpose.

### Prioritising FAT

Another factor to take into consideration when integrating any new smart manufacturing solution into your production line is the Factory Acceptance Test (FAT). FANUC UK had noticed that many of its customers lacked the technical expertise to complete FAT themselves, delaying installation and commissioning. FANUC UK has therefore developed its own in-house FAT facility at its headquarters in Coventry. Launched in June 2022, the FAT unit was constructed using ultra-hygienic cleanroom materials and encompasses a total area of more than 200 m<sup>2</sup>.

“As a result of growing global supply chain issues, we noticed that many of our customers are bringing their manufacturing processes back to the UK, after years of relying on production capabilities in the Far

East, Asia or Eastern Europe,” says Dave Raine, FANUC’s RO-BOSHOT manager for the UK & Ireland.

“However, after offshoring their manufacturing for so long, many have not managed to retain members of staff with the process validation, project management, technical compliance and robotics integrations skills required to complete in-house FAT testing when purchasing a new, smart, injection moulding machine. This is only being compounded by the post-COVID labour crisis currently facing the sector. Without the required skill set, plastics manufacturers run the risk of prolonged downtime and incorrectly specified machinery, both of which can seriously impact their bottom line. In response, we have developed our own, dedicated on-site FAT facility specifically for our injection moulding clients. Here, they can take advantage of our best-in-class validation and certification expertise, safe in the knowledge that their machine will operate exactly as required, and to the necessary industry standards, from the moment it is delivered to their factory.”

The FANUC Corporation is one of the worldwide leaders in factory automation for CNC control systems, robots and production machinery. Since 1956, FANUC has been a pioneer in the development of numerically controlled machines in the automation industry. With 271 FANUC locations worldwide and more than 8,000 employees, FANUC offers a dense network in sales, technical support, research and development, logistics and customer service.

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# Optimised toolpaths for medical engineering components

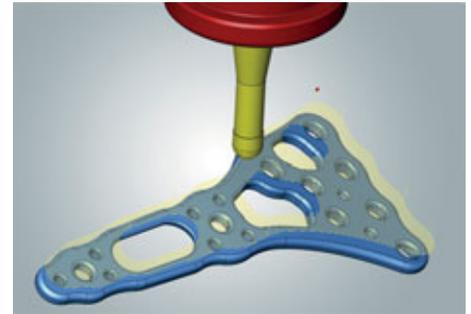
OPEN MIND Technologies now offers hyperMILL® MEDICAL Solutions for companies that handle demanding machining tasks in the medical industry. Manufacturers of implants and bone plates in various standard sizes can benefit from automated CAM programming. Optimised toolpaths protect machines and tools, enable safe and efficient processes and ensure high surface qualities.

Despite the diverse range of shapes and materials used in the sector, what most machining tasks have in common is a high level of complexity. As one of the leading CAM systems for 5-axis machining, hyperMILL has made a name for itself in programming efficient toolpaths for implants and other medical engineering products. When it comes to producing high-quality surfaces with minimum need for finishing, OPEN MIND offers optimised finishing strategies that ensure perfect transitions between different sections.

A key feature of hyperMILL MEDICAL Solutions is its powerful tool database with interfaces to catalogues from renowned tool

manufacturers. Special tools can also be mapped in the tool database. Materials suitable for medical applications, whether it is titanium, cobalt-chromium alloys or temperature-sensitive plastics such as UHMWPE, are usually difficult to machine. It is therefore important to select suitable tools and cutting parameters and to account for these when programming the toolpaths with 2.5D, 3D or 5-axis strategies.

hyperMILL MEDICAL Solutions shines when it comes to accommodating the need for patient-specific adjustments, the various standard sizes and part families, as well as the associated automation of NC code generation. The hyperMILL AUTOMATION Centre allows users to define and standardise CAD/CAM processes. This includes the specification of steps for data preparation and programming, right up to simulation and NC program generation. Once this has been done, the process is deployed and carried out on new components automatically. This makes it possible to automatically prepare and programme machining projects.



Automation can be learned by any CAM user with ease, but OPEN MIND also offers support for the automation of CAD/CAM processes. Numerous satisfied customers of automation projects can testify to the solution's enormous potential for saving time. Users in medical technology who already use hyperMILL greatly appreciate the CAD/CAM suite.

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**www.openmind-tech.com**

# Final cleaning of medical technology products and sterile packaging with pre-validated material

Manufacturers of medical technology products worldwide have to meet the ever-increasing demands and stricter regulatory requirements of the FDA and MDR. Since the introduction of the MDR, final cleaning and packaging have been critical elements of the product. This leads to a considerable economical effort for medical technology companies. In order to optimally support and relieve companies in these processes, the SBS Ecoclean Group, a global provider of turnkey cleaning solutions for medical technology and VC999 Medical entered into a close cooperation. It enables the planning and worldwide delivery of complete turnkey solutions for cleaning and sterile packaging, including packaging validation, from a single source.

The SBS Ecoclean Group and VC999 Medical have concluded a worldwide sales and service cooperation with the aim of minimising both the time and financial effort involved in certifying and validating the cleaning and sterile packaging of medical technology products. Ecoclean

supplements its turnkey range for medical technology with the MDR and GMP-compliant packaging systems of VC999 Medical, which, depending on the application, already contain prevalidated packaging materials (PAPE, Tyvek and paper/foil).

"The packaging machines and materials from VC999 Medical have been established on the global market for decades and ideally complete our portfolio," reports Fabio Cordaro, global business development CLP and expert for parts cleaning in medical technology at Ecoclean. "This enables us to plan and supply manufacturers of medical technology products, such as implants and instruments, with complete turnkey solutions, from preliminary and intermediate cleaning during production to final cleaning and transfer to the clean room to sterile packaging."

VC999 Medical is a business unit of the Swiss VC999 Verpackungssysteme AG that specialises in packaging and is represented in over 70 countries around the world. The



family-run company is the only manufacturer of packaging solutions in the world to have its own packaging validation with a shelf life of ten years.

For optimal process design and coordination, the partners have mapped a complete process chain from preliminary, intermediate and final cleaning, including clean room and packaging, at Ecoclean's Centre of Competence in Monschau, Germany.

**Ecoclean GmbH**  
**Tel: 0049 711 7006 223**  
**www.ecoclean-group.net**

# Walter TC130 Supreme tap with improved quality and tool life

With the new TC130 HSS-E Supreme tap, Walter is launching a premium tool for blind-hole tapping that combines many different benefits. Taking tapping to a new level, the new TC130 Supreme tap incorporates straight grooves to produce short chips, resulting in high process reliability.

The special geometry of the taps produces an exceptionally high surface quality on the threads, which improves tool life by maintaining the quality of the thread. The last thread in the chamfer section of the tool is designed to 'finish' the thread and this results in an excellent thread surface. The high thread quality results in improved tool life.

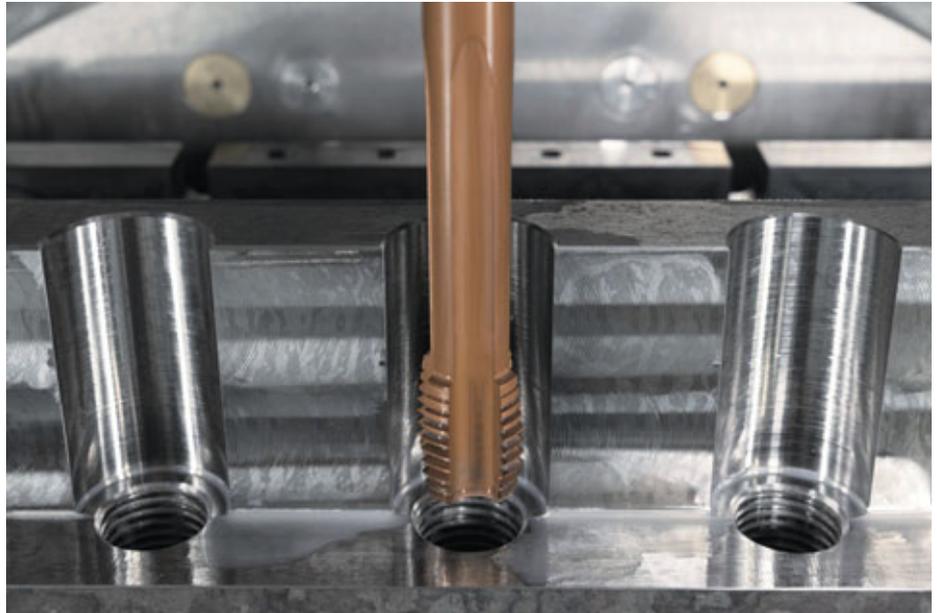
Walter is offering the TC130 Supreme tap for thread depths up to 3.5 x DN with a wide product range including larger thread sizes. This includes M4 to M42, metric coarse, M10 x 1 to M33 x 2, metric fine and UNC ¼ to UNC 1. As well as the impressive geometry, the two coating options: TiN coating, WY80AA, as well as the HiPIMS coating, WY80EH, further improve the wear resistance and thread quality.

The TC130 Supreme HSS-E taps feature axial internal coolant and have a tolerance of 6HX. As the taps can be used for ISO materials P and K, users benefit in particular from the competitive advantage offered by the innovative new patent-pending geometry. Preferred application areas include interference contours, deep threads, large batch sizes and series production.

### Reliable and stable in steel

With the MP6 geometry, Walter is rounding off its range for medium machining of steel, secondary application: ISO M, K, S. The MP6 combines features for medium machining, such as a positive rake angle, with those of roughing inserts, for example, a tough cutting edge. This makes it the perfect link between the existing MP4 geometry for medium machining, with excellent chip breaking on soft steels and the RP4 geometry for roughing operations, with a tough cutting edge for high feeds.

Walter offers the MP6 geometry in CCMT, DCMT, TCMT and VBMT basic ISO shapes.



The short primary chamfer on the cutting edge, which is characteristic of roughing inserts, ensures a high degree of stability, even in challenging conditions, for example when machining forged parts with interrupted cuts. The 18° rake angle, tough cutting edge and special chip breaking geometry ensure excellent chip control during medium machining.

Walter specifies feeds from 0.1 to 0.4 mms per rev and depths of cut from 0.4 to 4 mms as the range for the machining parameters. To prevent vibration, for example with thin-walled components, Walter has given the MP6 geometry an open chip breaker groove. This reduces the cutting pressure even when cutting at a higher depth of cut.

This also makes the MP6 ideal for unstable components and components with long overhangs, for example during internal turning. Its straight cutting edge makes it suitable for use as a chamfer insert, regardless of the application. The new Tiger-tec® Gold grades also have a positive impact on tool life. WPP10G, WPP20G and WPP30G are adapted to different operating conditions, leading to increased tool life and performance across a broad range of applications.

Walter is one of the world's leading



metalworking companies. As a provider of specialised machining solutions, it offers a wide range of precision tools for milling, turning, drilling and threading applications. The company works together with its customers to develop custom solutions for fully machining components for use in the aviation and aerospace industries, as well as automotive, energy, and general engineering. As an innovative partner capable of creating digital process solutions for optimal efficiency, Walter is pioneering Industry 4.0 throughout the machining industry. With around 3,800 employees worldwide, together with its numerous subsidiaries and sales partners, Walter AG serves customers in over 80 different countries.

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# Tenon gets a 'grip' on machining efficiency with LANG Workholding

Tenon Engineering Ltd enjoys a global reputation for its high-precision manufacturing capabilities. In addition to serving an international scientific equipment client base, the Dorking, Surrey-based business counts companies involved in similarly demanding technical sectors as loyal customers.

Approximately 80 percent of Tenon Engineering's output is exported to major markets in the USA, Asia, Africa and Europe. Along with its high-precision subcontract work the business also manufactures for its sister company, Wallace Instruments, a leader in the quality assurance testing of rubber, plastics and other materials.

Given the nature of the sectors it serves and the critical functions that much of its output is designed to perform, quality, accuracy, efficiency and reliability are central to the business' ethos. To help ensure that these values are adhered to, Tenon Engineering boasts a comprehensive range of in-house resources, including multi-axis machining, cylindrical grinding, precision sheet metal fabrication, assembly and coil winding, alongside electrical motor manufacture.

The company's impressive machining facility house a variety of advanced CNC machine tools including a range of Dugard

CNC lathes and several multi-axis machining centres. As the business's machine tools are normally involved in performing the low volume production of high precision parts, to help minimise job changeover times and to reduce non-productive periods, Tenon Engineering chief engineer, Terry Healy searched for a suitably efficient workholding system. The answer to his quest was found in a LANG Pre-stamping unit along with a collection of LANG Technik Makro grip vices.

He explains. "Our capabilities and world class engineering expertise, from the design and development of prototypes to all aspects of manufacturing, means that we can provide innovative solutions across a multitude of industries. Therefore, our international customer base includes companies involved in the scientific instrumentation, materials testing equipment, aviation, medical instrumentation and quality control analysis sectors. The nature of our customer means that our machine tools are generally employed in high-value, relatively short machining runs.

Consequently, with the intention of cutting the times lost in job changeovers and increasing our machining efficiencies, we invested in LANG Technik's advanced

pre-stamping technology and Makro grip vices.

Terry Healy continues: "The use of LANG Technik's advanced workholding systems on our machine tools has achieved our target of significantly speeding-up our job change-over times and increasing the efficiency of our machine tools. By using our LANG Technik products a lot of the work involved in setting-up the next job on a particular machine tool can now be done while the current machining task is still being performed.

"Now, within the cycle time of an existing job, our production staff use our new LANG Technik stamping unit to make high-precision, small indentations into the next workpiece blank to be machined. Then, when the prepared workpiece is clamped into one of our LANG Makro-grip vices, the features on the vice's jaws engage precisely with the workpiece's pre-stamped indentations. By using this LANG Technik arrangement, we are able to achieve outstanding holding power whilst only needing to apply minimal clamping forces. Also, the rapid loading and unloading of our LANG Technik workholding means we have achieved much quicker job change-over times.

"The LANG Technik system's reduced holding pressure requirement ensures that, under all machining conditions, we are able to securely clamp from the softest to the hardest of materials without worrying about the component deforming or the vice loosening its grip under high machining loads. An added advantage is that the LANG Technik stamping unit makes its indentations into just the last 3 mm of each workpiece blanks, therefore we are now also making savings on material."

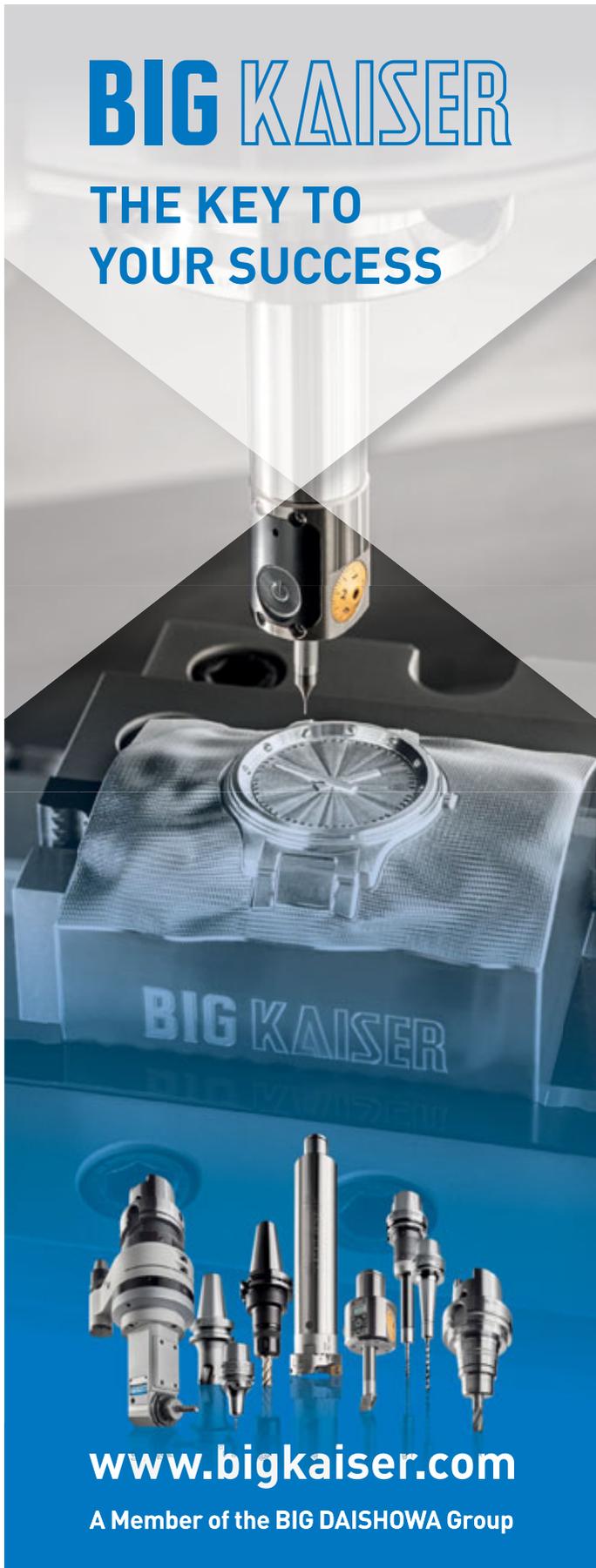
The many benefits gained from the use of the innovative LANG Technik pre-stamping technology and Makro grip vices has ensured that the system has become the benchmark clamping method for ultra-secure 5-axis machining.

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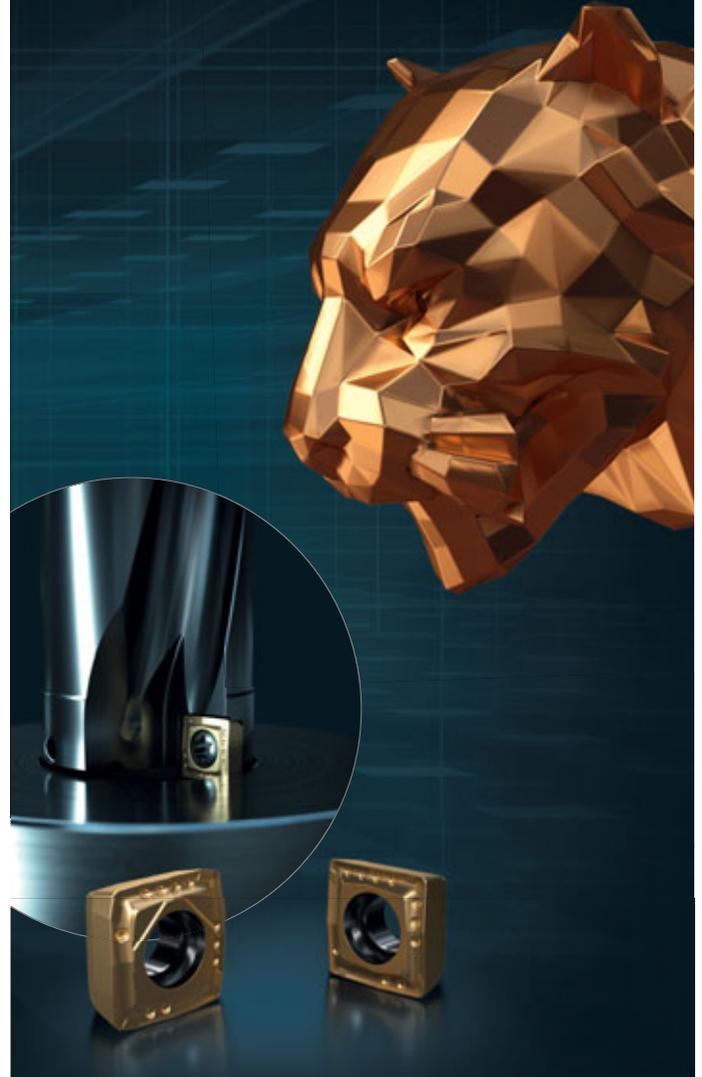
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# ITC tools double tool life for Millennium

As part of the R&G Fluid Power Group of companies, Millennium Engineering Ltd is a specialist manufacturer of critical components to the automotive, oil & gas, food & drink and machine manufacturing sectors. Working out of a 9,000 sq.ft facility in Preston, the company machines a diverse range of materials. It is here that cutting tools from Tamworth specialists Industrial Tooling Corporation (ITC) Ltd makes the difference.

Serving a diverse range of customers, the Lancashire manufacturer machines everything from steel and stainless, aluminium and brass through to exotic materials such as titanium, inonel, duplex and a host of other materials that make every day an interesting challenge for the shop floor. Maximising its productivity with the application of heavy-duty Doosan CNC sub-spindle turning centres, 3- and 4-axis Hurco machining centres and high-end CAD/CAM software, the company has an intent to focus on maximising productivity levels while maintaining impeccable quality levels and productivity rates. It is here that cutting tools from ITC complete the loop of high-end technology to maximise throughput.

Recalling how the ISO: 9001 certified company started its journey with ITC, Mat Jackson from Millennium Engineering says: "We were previously using a high-profile cutting tool manufacturer to supply the majority of our cutting tools, unfortunately



the service and support was substandard. We employed a new machinist that had previously run his own machine shop and he strongly recommended that we adopt cutting tools from ITC. We invited ITC in to discuss our requirements and that was 4-5 years ago. Gary Murrey, the ITC application engineer visited us and introduced and proved out some steel turning inserts. The difference was night and day. With the previous inserts, we were rough machining 10 parts per insert edge. With the Widia CNMG-RH chip breaking inserts from ITC, we immediately doubled our tool life to 20 parts per insert edge."

What impressed Millennium Engineering, above all else, was the commitment of the ITC representative to ensure the optimal results were achieved. With six high-specification CNC turning centres with live tooling on the shop floor and two CNC machining centres, the emphasis had primarily been placed on turning activities.

The company also manufactures scroll tails with twin threads for composite hose couplings. With the component batches varying from 10 to 300-off per month in sizes from ½" to 16-inch diameter, the parts required considerable turning with cycle times extending beyond 20 minutes. With expert support from ITC, the steel scroll tails had the cycle time reduced from 20 minutes to just 5, a 75 percent improvement with ITC cutting tools.

With an immediate impact and such dramatic improvements to tool life and subsequently cycle times, the ITC engineers were also invited to look in greater depth at other applications throughout the business. This resulted in the ITC engineers reviewing the 6082 aluminium brake kits the company manufactures for motorsport teams and competition cars. With the brake kits consisting of multiple aluminium components such as bells and brackets, the ITC engineers identified an issue with poor cycle times on turned parts.

Mat Jackson concludes: "We were going through 3 to 4 aluminium turning inserts a week. This was a combination of using the incorrect inserts and also not having the technical support from our previous tooling supplier. ITC reviewed the process and implemented their Widia turning inserts and we now use their inserts for both rough and finish turning operations. As for the tool life, we have gone from using a box of 10 inserts every two weeks to an unbelievable tool life improvement. We bought a box of 10 Widia inserts from ITC back in September 2021 and we are still working our way through that first box of inserts we bought."

**Industrial Tooling Corporation Ltd**  
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**Email: sales@itc-ltd.co.uk**  
**www.itc-ltd.co.uk**



## Allied Machine expands Wohlhaupter boring tool product line

### 410 series and 464 smaller sizes now available

Allied Machine and Engineering, a leading manufacturer of holmaking and finishing cutting tools for the metal cutting industry, continues to expand the Wohlhaupter boring tool product line with the launch of the 410 series fine boring heads as well as the expansion of the 464 series. Both the 410 and 464 digital boring heads are equipped with a 3ETECH docking port for easy digital diameter adjustments.

As the world's smallest digital fine boring tool with a peripheral cutting edge, the unbalanced 410 series has a diameter range of 20.00 - 29.00 mm. The 464 boring heads offer automatic self-balancing and bore diameters from 29.00 - 205.00 mm. These boring heads have a special design to minimise the residual imbalance produced by insert holder displacement. As a result, the tools remain stable even with light interrupted cuts throughout the entire machining process and achieve the tightest tolerances and optimum surface quality. Additionally, the insert holder can be rotated for reverse machining jobs.



The tools are available in the non-digital version with vernier scale adjustment or in the digital version for adaptation with the 3ETECH digital display for  $\mu$ -accurate adjustment. Wohlhaupter's 3ETECH digital display module can now be used with all types of precision boring tools including fine boring with the 410 and 464 series, versatile boring with VarioBore, large diameter boring with the 537 finish boring cassettes and custom boring tool solutions. The digital display module is docked to the tool, allowing maximum coolant pressure to be used and eliminating the risk of damaging the digital components during operation. Users now only need a single display module

for all tools with integrated 3ETECH technology, which reduces tooling costs.

"The 410 and 464 series boring heads are the smallest digital boring tools of their kind on the market. Starting with diameters as small as 20 mm for unbalanced and 29 mm for balanced, these boring heads offer the appropriate range for a wide variety of applications up to 205 mm on diameter," says Frank M. Wohlhaupter, managing partner of Wohlhaupter.

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# Special not only in production

Toolmaker Rieco System Srl achieves greater machining precision with GibbsCAM

If you need one tool capable of doing the same job as multiple tools, or you want to achieve greater machining precision, a Rieco special tool will be able to meet these demands. Rieco has been active in the production of precision tools for machining, turning and special custom tools for over 25 years. During this time it has become a point of reference for its customers due to its ability to carry out any type of customised design and machining.

The company, based in Schio, Vicenza, Italy also has a large package of standard products in its catalogue such as: modular fixtures, vices and workpiece gripping systems, micro-adjustable units, mechanically clamped milling cutters and adjustable cartridges. These tools can be used in a range of industry sectors including hydraulics, precision mechanics, automotive, aerospace, and more. Rieco is committed to manufacturing excellence, selecting only certified raw materials, using the most modern and diverse coatings and the digitalisation of the entire production process. Rieco also prides itself on its strong staff of experienced technicians, the use of state-of-the-art CAM software and CNC machinery, exceptional product quality and swift execution.

### Innovative thinking

Rieco System Srl was founded in 1996 by two partners who shared toolmaking experience at a previous company. Today Rieco has more than 40 employees and continues to expand. As Rieco's managing director Luca Scolaro explains: "After thousands of customers and tens of thousands of completed projects, we can say that we have become a source of manufacturing excellence for our national and international customers. We consider ourselves a real tailor's shop for tools of all kinds. The ability to guarantee delivery of complex equipment to our customers in a short time frame is of paramount importance while always keeping the concept of quality in mind. Rapid development of innovative ideas, speed of response and a highly qualified service are our core strengths."

In an increasingly competitive market, Rieco positions itself as a company that



works closely with its customers to optimise the production process. All tools and equipment built are subjected to very strict laboratory tests for reliability, strength and precision. Rieco tools are in demand beyond the domestic market. Luca Scolaro says: "For the past few years we have begun to make ourselves known internationally where we've seen steady growth. We have a team of five technical experts that work on non-standard chip removal solutions. In addition to direct relationships with larger clients, we rely on dealers who have connections in the field, passing on the drawing or the problem to be solved. The prerequisite for our success is innovative thinking combined with accurate customer service. We provide prompt and effective solutions and can handle any issues that arise."

### Over fifty thousand projects

When it is necessary to meet special dimensions, reach unusual depths, increase speed in stock removal, or overcome extraordinary obstacles, the use of standard tools fails to deliver the increasingly high-performance results required today. For example, a longer shank needed to complete a machining task could increase the risk of vibration. In this case, Rieco engineers study suitable materials and perform accurate sizing analyses, even for special spindles. If you then have to change a parameter, that change may affect other criteria thus imposing new calculations. In effect, when designing custom tooling, you are always creating a prototype. Very sophisticated technologies well beyond common milling cutters are at the heart of every project. However, such driven



research can trigger the emergence of a family of tools, allowing better payback from the initial design effort. In 25 years of operation, Rieco's catalogue already includes more than 50 thousand special tool designs. All stages of the development process from design to the implementation of machining paths take place in-house with the exception of any coatings.

### A modular CAM system

On the shop floor, a modern and flexible fleet of machines is at work which include a Deckel Maho DMU60/80 vertical machining centre and a MORI Seiki NL2500 CNC lathe with Y-axis. They are programmed using GibbsCAM software, a CAM system capable of driving every type of machine tool from simple lathes to the most complex multi-tasking CNC.

Luca Scolaro explains the benefits in detail: "We had examined and used various products over time, but GibbsCAM proved to be the system best suited to our needs. We initially started with just the milling module, but then quickly added the turning module before growing our capabilities by adding the Y-axis turning, combined mill-turn machining, and finally 5-axis



continuous machining. GibbsCAM has been in use for many years now and we have appreciated the continuous addition of software features over time, which now offers modules dedicated to special shapes.

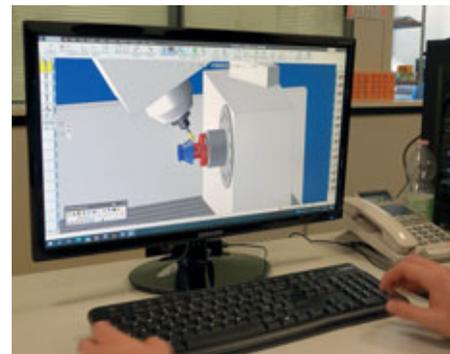
One example is eccentric milling used for building Capto couplings whose shape is

defined by a mathematical formula and not by simple geometry. We have to create ellipses, which we accomplish brilliantly by milling from solid. Thus, we can obtain the characteristic trilobular and conical shapes that are capable of ensuring the highest precision and clamping force. One of the latest proposed functions concerns precisely this type of machining and we are eager to experiment with it further. Another very complex machining style is cartridge boring, especially when there are dozens of cartridges, which is typical in our case. Here, GibbsCAM is essential because its intelligent automation allows us to cut down time and optimise machining."

**Optimised toolpath simulated on the screen**

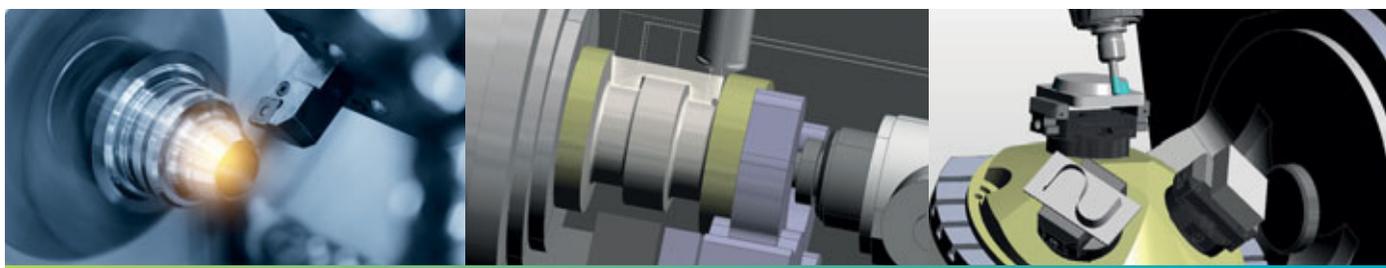
Today, you cannot be competitive without toolpaths that are capable of fully exploiting the enormous potential of increasingly sophisticated CNC machines. GibbsCAM provides powerful technology capable of building tailor-made tool paths, such as driving two different tools to machine the workpiece simultaneously and significantly reducing cycle times.

Luca Scolaro concludes: "GibbsCAM enables faster programming, and



guarantees better accuracy, greater reliability and consistency of results. This means less time proving out on the machines and more parts made. Another feature is the ability to capture and store the knowledge acquired through parameters and settings in order to distribute them throughout the shopfloor and easily deploy proven company standards. Machining processes and methodologies, fine-tuned by more experienced engineers, can be conveniently stored, and exploited later by other technicians."

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# Intelligent Manufacturing with Tebis CAD/CAM?

Tebis is well known as a premium CAD/CAM and MES software company that offers advanced solutions for model, pattern, die and mould making as well as mechanical component manufacturing. Tebis also helps customers to optimise CNC machining processes and to automate CAM work with Intelligent Manufacturing technologies.

Tebis Intelligent Manufacturing software and associated services help customers to increase productivity and profitability.

## Intelligent Manufacturing with best practice built into libraries

The best CNC machining practices of a company can be built into Tebis library database which can then be shared and reused for daily operations. This will help to optimise uses of machine capacities and cutting tools as well as to optimise machining processes and machining parameters. Tebis works together with customers to define goals and to achieve them, with experiences of thousands of projects done worldwide.

## Virtual Machine library

For CNC programming, Tebis uses Virtual Machines (VM) for toolpath calculations in addition to cutting tools, tool holders and machine tool heads. VM geometry information and machine tool axis limits are included for toolpath calculations. Besides ensuring machining safety, it is possible to see if a toolpath angle can be achieved on the machine during CNC programming. Tebis will not allow creation of a toolpath which is not achievable in reality. Special parameters for VM's can also be defined during the programming stage to account for certain applications such as activating the particular parameters which you may not always want to be active. With Tebis, what you see is what you get. It is a clear advantage that VM's are an integral part of Tebis CAM software, which can save time and money by avoiding using a separate machine simulation and toolpath verification software package.

## Clamping devices library

Tebis clamping device library represents all common devices for fixing parts in the machining process. From the screwless vise to clamps and chucks, all common clamping devices can now be easily managed in a library and quickly used for realistic simulation and collision checking. In the CAD/CAM model, the precise clamping position can be exactly aligned, zero point and

conventional clamping systems represented, and all assembly possibilities checked. Tebis supports virtual clamping and validation with clamping device library, which increases productivity and profitability by saving time on job setup and avoiding costly wrong clamping and fixturing at the shopfloor.

## Cutting tools library

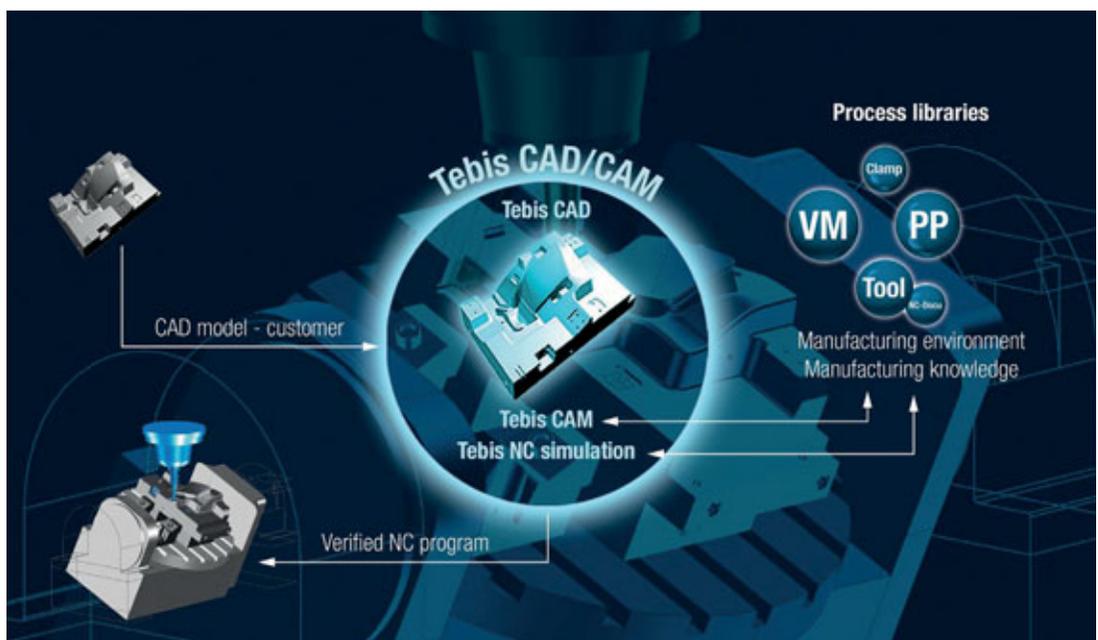
Tebis cutting tool library not only stores cutting tool geometry shape information, but also stores advanced machining parameters grouped for different materials, different tools and toolholders, different machine tools as well as different machining processes. Tebis cutting tool library stores comprehensive machining parameter types such as corner feed rates, stepdown feed rates, machining depth, machining width and coolant options in addition to conventional machining parameters.

Tebis cutting tool library is capable of storing exact geometries of cutting tools, toolholders and intermediate toolholders and can validate the assembly. This ensures these elements used by the CAM users are correct and available on the shop floor.

With the Cloud-based environment, Tebis has the master tool library sitting on the Cloud central server which is managed by the administrator to ensure consistent uses among all users even across different work shifts and sites.

## Geometry Feature library and feature-based machining

Tebis Geometry Feature library recognises geometry data within CAD models. Once Tebis software recognises the geometry data and assigns some basic attributes, then, Tebis can start to add predefined machining operations to machine the geometries in the CAM programming process. This creates an environment where machining operations and parameters for machining the features can be optimised, standardised, predefined and are consistent



across the company's entire working process to improve CAM programming efficiency and quality.

With Geometry Feature library, Tebis automatically detects and assigns features to the geometries and automatically group features for machining. In addition to working with ruled geometries, Tebis software also recognises free-form geometries and does feature-based NC programming. Features are not limited to the usual 2.5D type features such as holes and a slots, Tebis software is also capable of dealing with 2D open features and free-form shapes.

### Machines Cycles library

Tebis NCsets are sets of predefined machining operations for individual geometry features. Once the NCsets are associated with geometry features, they can be used to machine entire groups of geometries with a single programming operation.

Tebis NCsets can be defined and optimised, then shared among CAM engineers as database library. This means that new recruits will only need one or two weeks training. This also means greatly reducing the difficulty and workload of CAM work as well as reducing the costs of CAM work by reducing the number of CAM personnel and also wage level for junior engineers while senior engineers can create more value by optimising CNC machining processes.

### Machining Process library

CNC machining processes with a series of toolpaths can be created, optimised and stored within Tebis library as templates. The predefined machining processes means that every time a new part is programmed, the surface quality and part accuracy is the same every time. With this level of consistent programming, it is very easy to control quality and also estimate how long a part will take to manufacture.

The automated programming also allows job knowledge to be retained within the company. If the company loses a key member of staff, the standards and strategies already developed within the company are retained with Tebis libraries. This also means that if the company employs a new CAM engineer, the new recruit can produce parts to the company's own existing standards rather than learning from the scratch. This comes with the added benefit that the learning curve for a new user can be much shorter than having to learn the entire software and machining processes.

### Digital Twin for optimised CNC machining

One of the key offerings of Tebis CAD/CAM is Digital Twin for optimised CNC machining. With the unique manufacturing database structure as the core of Tebis CAD/CAM system, all key elements of customers' manufacturing environments can be built into Tebis libraries as one to one Digital Twins, same as the physical objects on the shopfloor, which can then be used to optimise CNC machining. This is especially significant that all toolpaths and machining parameters can be optimised for individual machine tools on the shopfloor with machine-oriented CAM programming, in addition to optimisations for cutting tool/toolholder assemblies, workpiece materials, clamping devices, and machining processes.

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# Adopting technology to fill the experience gap and do more with less

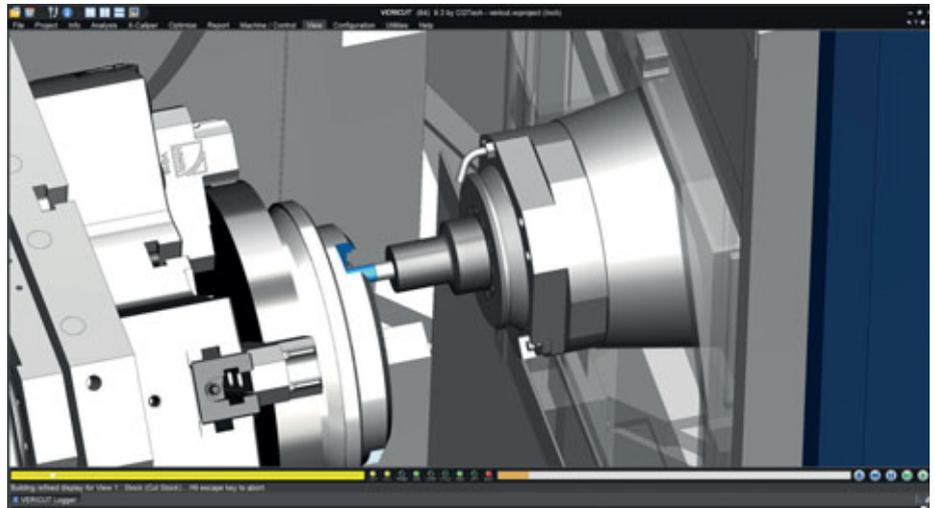
There is no denying that skilled machinists are hard to come by. With a large percentage of the current workforce of NC programmers and machinists getting ready to retire and a shortage of newly qualified engineering talent, finding people to work in this industry and fill the void is becoming increasingly more difficult.

Last year's reports from the Institution of Engineering and Technology estimated a shortfall of over 173,000 workers in the STEM sector, with an average of 10 unfilled roles per business in the UK. What's more, the Institution's Skills Survey identifies that half of engineering businesses are experiencing difficulties in the skills available to them when trying to recruit.

Long-term pipelines of talent have been established by creating pathways and opportunities for students to enter manufacturing, such as apprenticeships, UTC programs and higher education. Of course, this doesn't happen overnight. Bridging the skills gap will take time and requires an ongoing, continuous effort. So how can we deal with a skills shortage now? We learn to do more with less and this is where software can make a difference.

## Smarter software and technology

Software can provide a large amount of data and information that can be used to improve the manufacturing workflow and free up a skilled machinist's time. VERICUT CNC simulation software can verify, simulate and optimise programs before they reach the shop floor. With these proven, optimised programs released to the shop floor, the need to have somebody monitoring the machine as it operates is eliminated. It also empowers newer machinists, helping them to learn quickly on the job, enabling greater automation and allowing operation of more machines with fewer people.



The VERICUT digital twin uses a control and machine to process the NC code exactly like the real machine does. Taking information from the real control, the virtual VERICUT machine is set up identically to the real machine. It is a true replica and seamless digital twin. Virtual machine kinematics simulate the machine movements throughout an NC program and VERICUT ensures that the parameters and limits on the virtual machine match the real operation on the shopfloor. Over-travel, collisions and other issues can be identified ahead of time versus the machinist stopping the machine, trying to figure out what went wrong and then what is required to get the machine going again.

VERICUT can also connect with multiple sources of software including CAD/CAM and tool management systems. Stock models, design or finished parts and fixtures can be selected using direct interfaces and imported into VERICUT ready to run a simulation. A skilled machinist's knowledge can be replaced by data from the tool manufacturer and tool databases. VERICUT further verifies the accuracy of a part by comparing the cut part to the design model and identifies any gouges, undercuts or excess material conditions.

Once the part is verified dimensionally, setup documentation, inspection reports, and tool lists can be generated. In VERICUT everything is collated into one report, regardless of which CAD/CAM system it originated from and a complete Reviewer

file allows any personnel to view and interact with the full simulation away from the programming office.

## Now time to optimise

The program is then ready to be optimised to create a more efficient program. VERICUT Force NC optimisation module identifies opportunities for faster feeds and speeds, or areas to reduce force loads. This results in faster cycle times, reduced tool wear and better part finish. Doing this ahead of time, before the program reaches the shop floor, ensures that the program runs more efficiently and eliminates the need for a machinist to adjust the feedrates and spindle speed at the machine.

## Doing more with less

Engineering companies are now facing the challenge of meeting increased demands and staying competitive with fewer programmers and machinists. Working smarter with software reduces the need to fill all those voids. VERICUT can verify a part, simulate the machining and optimise the NC code before any real machining has started. Therefore making unattended or lights out machining, and the ability to operate with less machinists, a reality.

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# Collaborative manufacturing to drive a digitised industry

## Sandvik Coromant hosts ISO standards development conference

In June 2022, Sandvik Coromant hosted a four-day ISO standards development meeting at its Sandvik Coromant Center in Sandviken, Sweden. Focusing on how several digital standards, of which Sandvik Coromant helped to form, could enable a collaborative environment across digital machining platforms and unleash the full potential of digital manufacturing, the event welcomed an audience from disciplines across the metal cutting industry.

The event provided an opportunity for manufacturing representatives from across the globe to meet, exchange experiences and get first-hand insight into standards for digital manufacturing and examples of how to implement them. Participants included Sweden’s Scania, SECO Tools, Sandvik, SIS, Chalmers and KTH, TDM Systems, Zoller and Walter Tools from Germany, Boeing Company, Lockheed Martin, STEP Tools, Mastercam and NIST from the US, and ETRI and KRISO from Korea.

Attendees took part in live demonstrations from Sandvik Coromant, Zoller, Mastercam, TDM Systems, CRIBWISE and STEP Tools to showcase how embracing the standards can facilitate connected, collaborative manufacturing processes.

It’s a pertinent time to consider digital standards. According to MarketsAndMarkets, the global digital twin market size was valued at USD 3.1 billion in 2020 and is projected to reach USD 48.2 billion by 2026. That’s an expected annual growth of 58 percent. The way in which manufacturers design, implement and work with machinery is shifting, with as much activity being hosted in the digital as it is in the physical world. To advise on best practice for approaching new technologies, like digital twins, the ISO committee on industrial data has developed almost 800 standards, covering product lifecycle management for everything from the energy and aerospace industries to everyday household products.

In particular, the committee has worked to develop several standards that support the use of process data in manufacturing. For several decades, Sandvik Coromant has offered its expertise towards the development, use case testing and evaluation of these standards. They include ISO 23247, ISO 10303 (STEP) and ISO 13399.

ISO 23247 supports the creation of digital twins for several elements involved in component manufacturing including the part being manufactured, engineering requirements, CAD, the

manufacturing process, CAM and the equipment needed, such as the machine tools, cutting tools and part handling devices. Using digital twins in manufacturing systems supports the faster and more efficient creation of better products and more efficient use of the equipment.

ISO 10303-238 (AP238), known as the STEP-NC standard, complements the ISO 6983 M and G code standard with an associative language that connects the CAD design data used to determine the machining requirements for an operation with the CAM process data that solves those requirements. Additionally, ISO 10303-242 (AP242) is an all-encompassing standard for managing 3D design models. Finally, ISO 13399 offers supports exchange of cutting tool data.

To learn more about Sandvik Coromant’s digital services and solutions, visit its website.

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# A&D achieve the 'Apex' of precision with Mitutoyo

Since the relatively recent launch of the CRYSTA-Apex V Series of Coordinate Measuring Machines (CMMs), the precision, speed and flexibility delivered by the innovative Mitutoyo CNC CMMs has ensured high levels of sales across a wide range of UK industries, not least within the country's subcontracting sector. One such busy subcontractor now reaping the benefits of using a CRYSTA-Apex V Series CMM is Glenrothes, Fife-based A & D Precision Engineering Ltd.

Much of A&D's success is based on the business regarding quality and efficiency as being one and the same thing. These values are reflected in the company's use of highly efficient CNC machine tools. The use of advanced 5-axis milling allows the machining of complex multi-sided parts with improved accuracy and reduced setup times. CNC turning with a Y-axis and live tooling allows the highly efficient turning and complete machining of parts that previously required separate milling operations.

Further ensuring enhanced quality and efficiency standards, A&D employ a variety of advanced Mitutoyo quality control equipment, including laser-scan micrometers, a Crysta Apex/Ko-Ga-Me shop floor CMM and a non-contact quick vision measuring system. The latest addition to A&D's Mitutoyo quality control aids is the company's recently installed CRYSTA-Apex V Series CMM fitted with a Renishaw RTP20 motorised head with a TP20 touch-trigger probe.

Explaining the reason for the CMMs purchase A&D managing director, John Trolland says: "In addition to employing highly skilled staff that uphold our standards, we also invest in high-precision quality control equipment. As Mitutoyo products provide the accuracy and speed of use we require and have also proven to be extremely reliable, over many years, we have remained loyal to the brand. In addition, it helps that we also receive an excellent service from the company.

"Having recently secured a

long-term contract for the production of large, complex components with demanding specifications, from a multi-national corporation, we needed a high-precision CMM with a capacity greater than that of our existing machine. After studying the impressive specification and the many new features included in the new CRYSTA-Apex V Series, as a previous user of Mitutoyo CMMs I was able to appreciate the technical leap forward in terms of precision, speed, ease-of-use and flexibility that the new CNC CMMs provide. Therefore, we were happy to place an order."

John Trolland continues: "Any bottlenecks in inspection can delay the delivery of components. Therefore, as well as our advanced new CMM solving our inspection capacity problem and further improving our already excellent precision measuring capabilities, its impressive speed has significantly improved the throughput of parts in our busy quality control department. Now, in addition to accurately inspecting single large components, our staff are able to load large batches of smaller parts onto the new machine's granite bed and start rapid, fully automated CNC inspection routines. On completion, we are able to archive all inspection results and, if required, generate detailed inspection reports.

"The rapid action of our new CRYSTA-Apex V CMM allows our quality personnel to provide quicker feedback, related to situations such as component features that are drifting towards out of tolerance conditions, to our production staff. Also, as our new CMM can perform an increased number of inspection routines each day, it will be able to keep-pace with all anticipated increases in production.

"Our purchasing decision was further influenced by the fact that the new Mitutoyo CMMs feature advanced SMS technology. Although we aren't currently using this facility, when we begin to link our various in-house systems, we anticipate making full use of this advanced Mitutoyo communication system."

Since its launch, the accuracy, speed and versatility of the CRYSTA-Apex V series of CMMs has resulted in record numbers of global sales. With a line-up of ten models covering the measurements of small to mid-sized workpieces, the cutting-edge CMMs are able to accommodate the majority of parts. In addition to standard tactile probes the new machines offer multi-sensor flexibility. If required, all models can be specified with vision, laser, surface-finish and scanning probe technologies. The A&D CRYSTA-Apex V



series CMM was supplied fitted with an advanced Renishaw RTP20 motorised head with an integral TP20 touch-trigger probe, providing improved productivity, increased reach and greater flexibility.

As the successor to the popular Mitutoyo CRYSTA-Apex S range, the new CMMs build on their predecessors' success and are able to perform very accurate measurements at high speed. In addition to use in quality departments, as the CRYSTA-Apex V series machines have a high resistance to environmental conditions, they are equally suitable for use on the shopfloor.

Given the advent of Smart Factories and the increasing use of The Internet of Things (IoT), CRYSTA-Apex V CMMs are equipped with Mitutoyo's recently introduced Smart Measuring System (SMS) technology. Proving extremely popular with many early users, SMS allows the online monitoring of each CMMs' operational status and the capture of records related to key parts. Although at present SMS is not relative to some customers, given the renowned longevity of Mitutoyo CMMs, if users wish to embrace the IoT at a later time, future-proof CRYSTA-Apex V CMMs will be able to seamlessly integrate into all new advanced communication systems.

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## FARO releases new Vantage Max Laser Tracker

FARO, a leader in 4D digital reality solutions, has announced the release of the new FARO® Vantage Max Laser Tracker. It comes available in two models, the VantageS6 Max and the VantageE6 Max.

The VantageS6 Max and VantageE6 Max Laser Trackers offer comprehensive, large-volume 3D measurement up to 80 m, streamlining processes and reducing inspection cycle times while ensuring complete confidence in the results. The new laser trackers maximise 6DoF measurement capabilities through the optional 6Probe, enabling precise measurement of hidden areas and small features.

Previously, users relied on a spherically mounted retroreflector laser tracker SMR to measure high accuracy points. In order to take these measurements, the user would select an appropriate target nest and have line of sight. With the higher accuracy of the Vantage Max, users can probe more points beyond the line of sight and without tooling changes, using an SMR only for alignment points and ultra-precision measurements. The result is a productivity improvement of 20 percent compared to lower accuracy probes.

The 6Probe is a 6DoF solution that meets the dynamic measurement, speed and accuracy requirements of the most challenging industrial applications. With kinematic self-identifying styli, users can change probing tips quickly and measure without any recalibration, plus measure hidden areas outside of the tracker's line of sight with wide acceptance angles. In fact, the



typical user of the new Vantage Max can save at up to 60 minutes of time on any given workday.

For companies that want to increase throughput while maintaining high inspection accuracy with an attractive 3D metrology option, then the new Vantage Max laser tracker system is the optimal choice.

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# Automation, sustainability and smart functionality

### The future of the laser is already here

A patented, cutting-edge design, an extremely extensive automation offering and a range of advanced process control and efficiency solutions are the cornerstones on which Salvagnini has built the L5 laser. It is a high-performance, high-dynamic system on medium-thin thicknesses, with reduced power consumption and competitive running costs, whatever the application, material and thickness, 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 are 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, source power, level of automation and digitisation, 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 unveiled for the very first time at EuroBLECH a new 8 kW high power density source, an ideal alternative to the indiscriminate increase in power outputs now common in the market, with a nod towards financial sustainability. This new introduction completes a wide range of power sources to meet the most varied production requirements. Increasingly small batch sizes need rapid automation for rapid or masked-time production changes. In the configuration presented at Hanover, L5 is fed from an LTWS store-tower, equipped with automated loading/unloading. LTWS makes different materials and thicknesses available for just-in-time production, reducing waiting times for sheet metal feeding and operator dependency.

The MCU automatic sorting device completes the layout and is used to easily stack parts of different shapes, sizes and weights. But the cutting system offered by Salvagnini also features a wide range of advanced process control and efficiency solutions, which further improve the performance of the L5 and make it a highly productive and versatile laser, with reduced power consumption and competitive running costs. Cutting has never been easier.

### A compass for high dynamics

For the design of its lasers, Salvagnini has patented a load-bearing beam structure, with a lightweight airplane manipulator. It offers many advantages including high rigidity, rapidity, positioning precision and accessibility to the whole worktable. The head is



coupled with the compass, a strong mechanical structure with a carbon fibre arm, which guarantees high precision even in the most aggressive cutting mode. With reduced inertia, using only rotary motors, the compass moves the head on the XY plane with high dynamics, reaching 5 g accelerations on short movements. The compass is controlled by a specific algorithm, integrated into the proprietary numerical control.

"The advanced compass which characterises the L5 ensures extremely reduced inertia while maintaining low energy consumption, in contrast to linear motor solutions," explains Pierandrea Bello, Salvagnini product manager for laser technologies. "Each laser head trajectory is obtained by the joint movement of 3 axes, one along the X-axis and two along the Y-axis. The algorithm gives the greatest acceleration to the axes with less inertia, thus ensuring high dynamics on both the cutting movements and the rapid movements. These high dynamics are best expressed in medium-thin thicknesses."

### 8 kW high power density

"A major innovation which we unveiled at EuroBLECH is the new 8 kW high power density source," Pierandrea Bello continues. "High power density can now be considered one of the distinctive features of our lasers. This new source further improves the L5 performance on medium-thin thicknesses, because the high-power density also allows significant improvements in cutting acceleration. The 8 kW high power density source guarantees cutting speeds higher than any other traditional 8 kW source and, at thicknesses of up to 6 mm, achieves cutting speeds even greater than those of a 10 kW source. Combining the 8 kW high power density source with the L5 means achieving even greater performance in its main range of application, which is precisely medium-thin material."

This new offering from Salvagnini, 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.

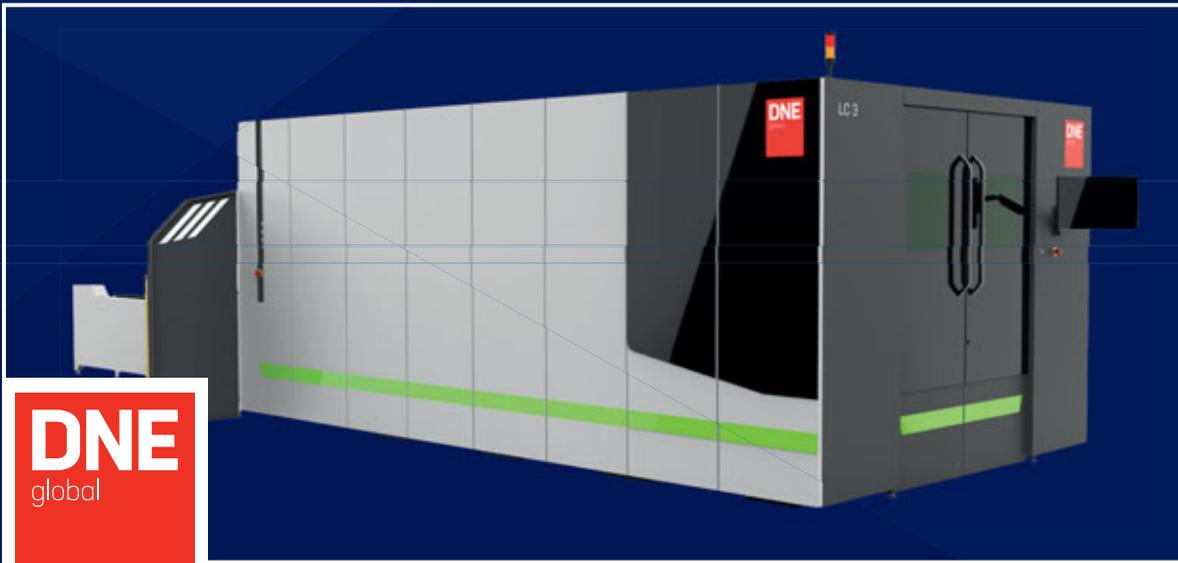
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Making Engineers Champions...

# TLCC delivers even more value to customers with TRUMPF EdgeLine Bevel

The latest machine to arrive at The Laser Cutting Co (TLCC) is a high-performance TRUMPF TruLaser 5040 fiber flat-bed laser cutter that features EdgeLine Bevel, a TRUMPF solution that allows users to bevel or countersink part edges automatically during the cutting process, reducing the need for costly and time-consuming secondary processes. According to TLCC, EdgeLine Bevel will represent a "strong addition to its existing customer offering".

With origins that date back nearly half a century, TLCC has the capability to cut round and square tube, structural open sections, beams and flat/bent metal components for customers throughout the UK. The company can also offer in-house bending, welding and sub-assembly, as well as having its own design team of CAD technicians, who provide the company's highly effective and popular Smart Design Production service.

"We've been growing significantly since the pandemic, both in terms of our customer base and month-on-month revenue," states sales director Charlie Day. "This prompted investment in the TRUMPF TruLaser 5040 fiber 10 kW flat-bed laser, which positions us for further growth as we can now process a significant volume of work in comparison with our competitors."

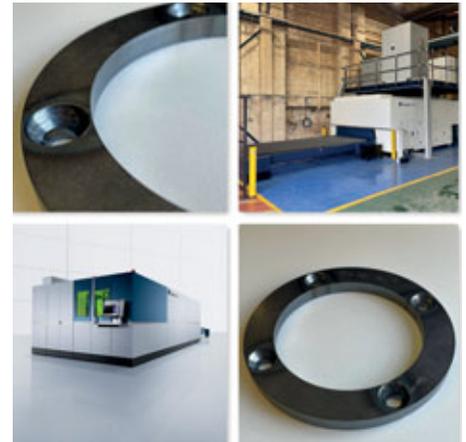
The new machine arrived at the end of February 2022, supporting the company's ethos of investing in the latest laser technology every year and being the first to market. It is the second TRUMPF model on site, where it joins a TruLaser Tube 7000 CO<sub>2</sub> machine, installed in 2020.

"One of our older flat-bed laser cutting machines was a 6 kW model from a TRUMPF competitor, which was proving slower than the general market demand," says Charlie Day. "The faster TruLaser 5040 fiber has provided a lot more capacity and is generally a much better machine. Our lasers are key to delivering on our short lead-time promises without compromising on cut quality."

The TruLaser 5040 fiber features TRUMPF's innovative EdgeLine Bevel function, which automatically inserts chamfers up to 45° and countersinks of various sizes, eliminating the need for secondary processes. This results in faster, more efficient, more flexible and simpler processes with fewer errors.

TLCC is all about delivering added value to customers. The company's Smart Design Production service means it can support customers by redesigning parts in a way that reduces subsequent fabrication and assembly times and associated costs.

"Customers achieve approximately 50 percent time and cost savings, on average, through Smart Design Production," continues Charlie Day. "EdgeLine Bevel will have a similar positive impact on our customers. If they need to weld the part after laser cutting and require a bevelled edge, it will simply arrive at their premises ready to process. If they combine that with tube from our TruLaser Tube machines then suddenly they can have a whole kit of products from us, complete with all countersinking and weld prep work already completed. It's a great addition to



what our customers are requesting on a daily basis."

Since installing its TruLaser 5040 fiber, TLCC has built its own mezzanine that sits above the machine to provide a platform for the resonator, cooler and other ancillary equipment, saving shop-floor space. The company has also installed a new jib crane to feed, load and unload quick-running jobs on full sheets.

"Among many benefits, the new machine allows us to cut thicker materials up to 30 mm in mild and stainless steel," says Charlie Day. "We're a 24/7 job shop so we have to be flexible. Every component is different to the last. The new TruLaser 5040 fiber is proving incredibly efficient and providing a massive difference in productivity."

Charlie Day concludes: "We're still making big strides forward, which includes recruiting more sales staff and CAD technicians to ensure fast turnaround on both quotes and order processing. In addition, we are emerging from a period of very volatile steel prices. However, during this period we've ensured we are offering steel prices that are accurate to market value, passing on our economies of scale to our customers who understand we get the best prices and they trust us to pass that on."

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# New innovations from MSS Lasers

## MSS Nitrocube - nitrogen generation system



MSS Lasers is a leader in on-site, high pressure nitrogen generation. With the most efficient system available anywhere, the Nitrocube combines the highest quality components housed in a unique cube enclosure with sophisticated MSS intelligent monitoring and controls. All systems provide 300 bar nitrogen with 99.98 percent and 99.999 percent gas purity as standard while a huge range of flow rates and storage capacities are available to suit most applications.

## MSS Nitr02 - innovative gas mixing system

Brand new to the UK and Europe, the MSS Nitr02 gas mixer panel has been specially developed by MSS for use with high power fiber laser cutting systems. The Nitr02 is the only system available on the market today that allows on-line variable gas mixing technology. Extremely compact, the system can be installed with minimum floor space without the need for any large storage tanks. This clever technology allows significant increases in fibre laser cutting speed and quality and gives higher quality cutting results on lower quality plate material.

## MSS Flowbox - gas use measuring & monitoring

MSS Flowbox is also brand new to the market. It measures and monitors high pressure nitrogen gas flow into the laser cutting system allowing the operator to exactly measure the amount of gas used on a daily basis and even scrutinise the volume of gas used per product/sheet being cut. The Flowbox can also be used for leak



detection and it can be installed on any laser cutting system.

## MSS Puregas - laser cutting gas filtration

The final new product introduced to the market is MSS PureGas. It filters high pressure nitrogen, oxygen and compressed gas to particles sizes  $>0.01 \mu\text{m}$  and can be installed on any fibre laser to give full protection against particle damage to the laser cutting system. For all fiber laser operators, it is a must.

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# Mazak debuts Laser Beam Shaping technology at EuroBLECH

### Laser-cutting beyond the limits of efficiency and sustainability

Yamazaki Mazak has unveiled two new game-changing laser processing machines for the cutting of tube, pipe and sheet metal at EuroBLECH 2022: the FG-400 NEO and OPTIPLEX 3015 NEO 15 kW.

#### FG-400 NEO

The FG-400 NEO can streamline production and improve performance by running multiple processes in one machine including 3D cutting, tapping, drilling, chamfering and flow-drilling.



The FG-400 NEO is designed for high-speed 3D laser cutting

The system is ideally suited for large-size tubes and pipes, including round, square and rectangular cross-sections as well as H, I, and L beams. Thanks to the combination of a brand-new 3D laser head with A-axis, B-axis and fiber laser technology, it can facilitate the stable machining of complex shapes and highly reflective materials, such as copper and brass. The 4-chucks system provides additional stability by preventing material distortion during processing.

To complement the machine, Mazak has developed a set of quality-of-life functions including part nesting, tool simulation and a tool path monitor to speed up setup times and enable continuous production.

#### OPTIPLEX 3015 NEO 15 kW

The OPTIPLEX 3015 NEO 15 kW is the newest entry in the OPTIPLEX 2D laser cutting machine series. Thanks to a winning



The OPTIPLEX 3015 NEO is Mazak's newest 2D laser processing machine

combination of MAZATROL SmoothLx CNC Control, MCT3 cutting-head and a wealth of customisation options, the machine delivers highly accurate and precise sheet metal processing.

The model benefits from a high degree of automated features to deliver faster setup times, up to 95 percent compared to standard laser machines, including automatic nozzle changing as well as automatic focus detection and positioning to improve ease-of-use and optimise piercing performance.

The large front and side access doors improve accessibility to the working area, easing loading and unloading operations. The Nozzle Auto Centering Camera displays the nozzle location on the CNC screen, allowing the operator to make adjustments on the torch, while the nesting feature automatically determines how to arrange the parts for optimal cutting on residual materials.

#### Automation

The OPTIPLEX 3015 NEO 15 kW displayed at EuroBLECH is equipped with the CST 3015 automation system featuring single tower mounted above the laser pallet changer. This CST 3015 automation system has 8 separate pallets each with a load capacity of up to 3,000 kg and deploys a suction-based system for the loading of raw material and a dual supported fork set for the unloading of processed workpieces.

#### Designed with environmental sustainability in mind

As a leading manufacturer of machine tools and laser processing machines, Mazak is strongly committed to reducing its environmental footprint and achieving carbon neutrality by 2030, as highlighted by the company's 'Go Green' initiative.

Both machines on display at EuroBLECH 2022 leverage Mazak's revolutionary Laser Beam Shaping and fibre technologies. The cutting quality is achieved by controlling the power density concentration of the laser beam, while a wide range of different materials and thicknesses can be accommodated by adjusting the beam's diameter and shape.

The fibre technology can deliver significant cost reductions and energy savings, up to 60 percent compared to previous models, while providing unsurpassed cutting speed and quality for both thick and thin materials.

Established in 1919 in Nagoya, Japan, Yamazaki Mazak continues to lead innovation in the manufacture of machining centres, automation systems and laser-cutting equipment for the tubes and sheet metal processing industry. Through an extensive international network, the company offers direct support to its customers by providing solutions with exceptional productivity and versatility.

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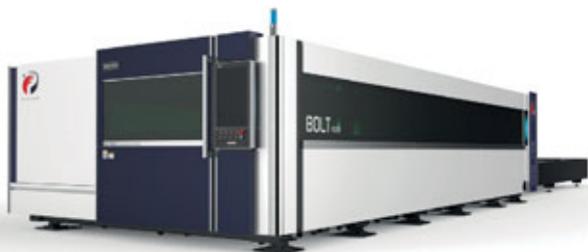
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## PENTA BOLT VII

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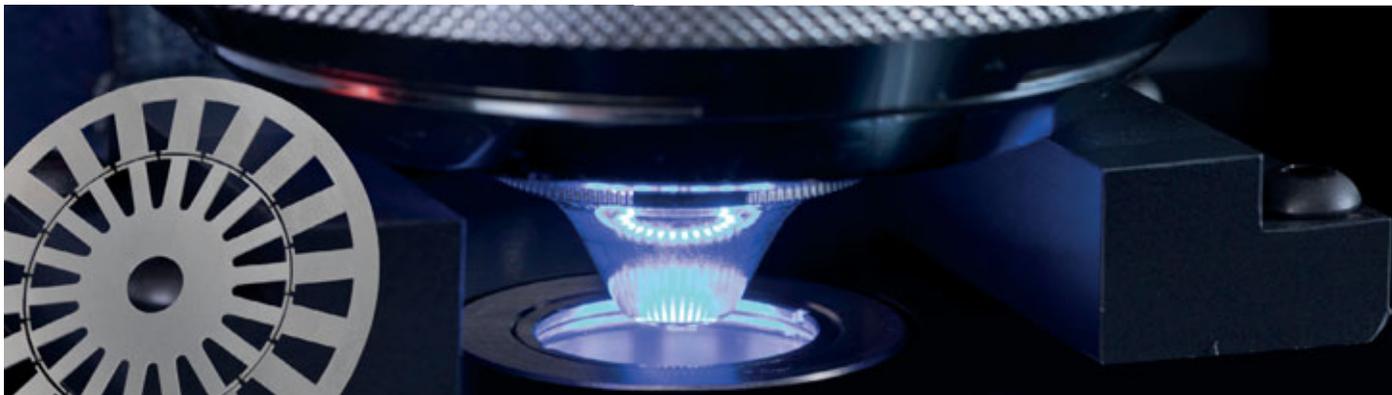
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- Precitec cutting head as standard



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# Bespoke products of the highest quality with an LVD press brake

An advanced LVD EasyForm press brake is helping Graepels, a leading specialist in perforated materials, produce bespoke products of the highest possible quality. Based in Kinsale, Ireland and with branches in Dublin, Belfast and Warrington, Graepels is a family business with its origins going back to 1889. The factory in Kinsale focuses on perforated metals, while Warrington also produces woven metal and perforated rubber products.

Managing director Fred Graepel explains: "We make products for all areas of industry. Architectural products account for about 50 percent of what we do but we also do a lot for the quarry industry, as well as for chemicals, food, pharmaceuticals, agriculture and the automobile industry."

Since Fred Graepel took over the company he has tried to concentrate more on added value work including producing perforated images, rolling tubes and formed metal parts produced on a press brake.

He continues: "We are turning flat sheet metal into a three-dimensional product, sometimes a complete finished product. For example, an architectural panel could be perforated, cut to size, notched, bolt holes added, folded and then painted."

### The right machine

He says that many of his customers are themselves metal fabricators and requirements are very diverse, so Fred Graepel wanted a machine that could offer all the capabilities that technology could provide at this time. This was a major consideration when the company started looking to buy a new press brake.

Fred Graepel says: "We need to offer the best quality and to manufacture in the most efficient way possible. We talked to the people who supplied and service our old



press brake and they told us that if we wanted the best machine on the market we should look at LVD.

"We contacted LVD in Belgium and spoke to Steven Lucas, LVD's global product manager for press brakes. I found somebody who was very knowledgeable and who could answer all my questions. I like to get into detail and Steven was able to do that. We ended up buying from LVD and we haven't looked back."

His discussions with Steven Lucas helped him to decide on the right model and specification for what Graepels needed and was trying to achieve.

Fred Graepel states: "We are manufacturing for customers who have their own press brakes, punching machines and lasers, so what they are expecting from us is top notch. They don't want anything that is not 100 percent. They come to us because they have something that is difficult to make, or something they don't have enough time for, so we need the best of the best."

The machine Graepels ordered was a 4 m bed length, 220t pressing force EFL press brake with EasyForm bend angle control, active crowning, hydraulic clamping for quick tool changes and two sheet followers to assist in the forming of long components. The machine features LVD's Touch B intuitive operator interface and is used in conjunction with LVD's CADMAN B offline programming software.

Graepels' punch press can produce perforated sheet up to 4 m by 2 m - 6 m by 2 m with repositioning and the LVD press brake covers most of their bending requirements.

### Forming accuracy

The variety of materials being formed make the EasyForm bend angle compensation system a key feature in ensuring that all parts are right first time.

Fred Graepel continues: "It is very important to us. For example, when we are folding aluminium, it is very ductile, whereas if it is stainless steel or Corten it is a tougher material and so there is a lot more spring back. So having the active angle measurement is very important to us and it has made a big difference with regard to quality and speed of production.

"When you have already added the value of perforating you have a quite high value material, so you want it to be right first time. If you start with a stainless-steel sheet worth €200, once it is punched it is worth €300 to €400 you are increasing the value all the time and you don't want it to be wrong. Eliminating rejects is a big cost saving."

Forming perforated material brings its own problems, as Fred Graepel explains:

"When we look at folding perforated sheet there are scenarios where you are bending blank and perforated in one-fold. If you have a long bend with part of it solid



and part of it perforated this can make it very tricky to get an accurate bend. On the LVD machine you can overcome this by controlling the crowning and the cylinders to give more pressure in the solid areas than the perforated areas. You need very sophisticated machines to be able to do that and control it very accurately."

### Software simplicity

Most of the design and development work at Graepels is done in Solidworks. These 3D files are then extracted into LVD's CADMAN B bending software which automatically unfolds the part and creates the bending programme offline.

The programs are sent to the machine where the operator uses LVD's user-friendly Touch B control interface to produce the part.



"It is very simple to use," says Fred Graepels. "It is a very intuitive interface. People who previously had no experience of folding are able to go on the machine, use that control and start making highly accurate parts. What is really nice is that the guys are really enthusiastic."

### Relationship with LVD

As mentioned earlier, the initial contact and pre-sale advice was through LVD in Belgium, because of Brexit it is easier to do that. But from the moment the order was placed the ongoing support has come from LVD UK, including managing the installation, training, warranty support and so on.

This reflects a strategic decision by LVD to serve Irish customers directly rather than through an agency.

LVD UK's managing director Neil Osborne says: "This demonstrates LVD's serious commitment to the Irish market. It is all about the support you give your customers both before and after the purchase."

Fred Graepel concludes: "Previously we



didn't know anybody from LVD UK, but we have had a good experience with them and have a good relationship. Dealing directly with LVD in the UK gives a much better partnership than going through an agency.

"I feel that we had a very good process from start to finish, right through to the installation, the trialling and the training it was a pleasure."

### LVD UK Ltd

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**Email: [salesteam@lvd.uk.com](mailto:salesteam@lvd.uk.com)**

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# Shaping flows.



# Kerf takes centre stage

As the name suggests, Serious Stages Ltd is a manufacturer of festival stages, temporary buildings, towers, arches, sports ramps and bespoke structures for the entertainment industry; an industry that was all but decimated by the pandemic. Fortunately for the Wells based business, it found a new market sector that has exceeded all expectations, trebled growth and increased manufacturing demand. To fulfil this rise in demand, the Somerset manufacturer has invested in an UltraSharp plasma cutting machine from Kerf Developments.

It was when the Glastonbury Pyramid stage tragically burnt down in 1984 that Steven Corfield, an employee of Glastonbury founder Michael Eavis, spotted an opportunity to manufacture high-quality and safe structures and stages for festivals. From the ashes rose a business that has flourished ever since, becoming the UK's leading manufacturer of festival and concert structures and the second largest in the world. It has installed more than 50 structures at Glastonbury each year. However, Glastonbury and its iconic Pyramid stage are just one festival on the long list of more than 500 annual events covered by Serious Stages with the Download festival, BBC's Big Weekend, Knebworth, Park Life, the Reading and Leeds Festivals, Proms in the Park and also stages for acts such as Queen, Ed Sheeran, Adele, Lionel Richie, Elton John and many others on the list. The company also exports structures to the Middle East and Australia among other countries.

Unfortunately, COVID restricted business and the company served the cause by producing morgues for the NHS Nightingale hospitals. Simultaneously, the company had a couple of structures out on lease with film studios and as the pandemic ebbed away, the movie industry picked back up and the



phones didn't stop ringing. Serious Stages fabrication workshop manager, Rob Watts says: "Before the pandemic, we were considering a laser or plasma machine, as we were subbing-out over £500,000 of laser cutting each year. The pandemic halted the decision process, but back in March 2021 the movie industry got back to production and we won a substantial order for the next Mission Impossible movie. This gave us the confidence to move forward. We looked at several options and then an industry contact suggested we spoke to Kerf. As a company with a complete range of plasma, waterjet and oxy-fuel cutting machines, Kerf recommended its RUR2500 UltraSharp plasma cutting machine with a Lincoln Electric Finline 170, 170 amp plasma cutting system."

At that time, Serious Stages was sending more than £500,000 of work out for laser cutting and the lead time was typically three to five weeks. With the 500+ annual structures requiring thousands of parts to be manufactured and shipped around the UK to complete a 150 to 180 tonne structure, the process is a logistical minefield. Serious Stages wanted to manage its inventory, reduce costs and cut lead times to less than a week while also having full control over the process. Kerf delivered the solution.

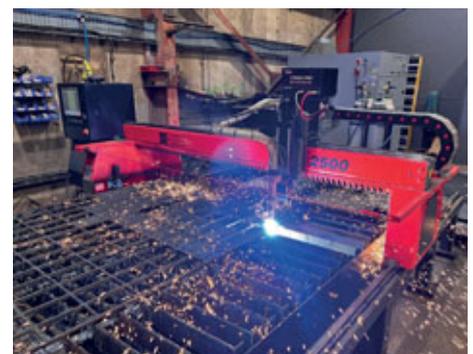
Rob Watts continues: "We produce tens



of thousands of cleats, fixtures, clamps and other components for our structures and they are all made from 3 to 20 mm thick mild steel with a typical tolerance band of +/- 0.5 mm. Taking these factors into account, Craig Walsh from Kerf recommended the UltraSharp plasma machine over a laser and it is perfect for our business. It is running 10-11 hours a day and six hours a day on weekends. The surface and edge finish are comparable to laser-cut parts but more importantly, we have wiped out the long lead times and we can make parts immediately for our fabricating team to weld. Deadlines are critical to our business. You cannot be overdue on a festival. The structure has to be safely installed and assembled to the event deadline."

Looking at the attributes of the 4 m by 2 m Kerf RUR2500 machine, Rob Watts continues: "The Finline 170HD, 170 amp plasma unit gives us exceptional cut quality and we can comfortably cut material up to 50 mm thick, even though we rarely go above 20 mm. The cutting head is extremely efficient and we can conduct more than 3,000 piercings before we have to change the nozzle heads. The Kerf support is the best we have encountered from any machine supplier so far."

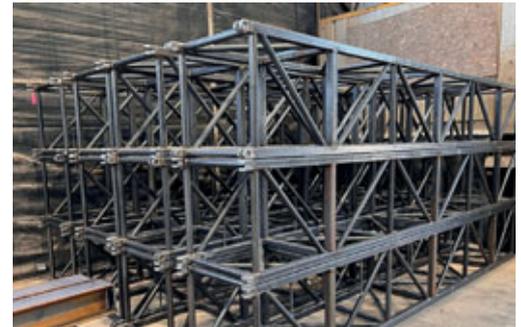
With the installation of the Kerf RUR2500,



Serious Stages has greater design freedom to develop new parts, enhance its existing portfolio of products and design parts for both manufacture and assembly. Rob Watts adds: "When we were subcontracting out laser cutting, our design freedom was limited. If our designers wanted to change a drawing, alter dimensions or move features we would have to create a new drawing, send it to the subcontract supplier and wait for them to produce the part and send it to us. We could be waiting weeks for the part and if the design change wasn't feasible, we would have to start again. The time constraints on our business limited this exercise. Now, a designer can create a new CAD file, use the Lantek software to convert the DXF file to a CAM file and then fire it

straight to the Kerf RUR2500. We can edit existing programmes in minutes and create new part drawings and send them straight to the Kerf machine."

With the company winning an order from the Mission Impossible franchise and orders rapidly coming in from other film studios, the subcontract laser cutting cost was rapidly heading from £500,000 to £750,000 which made the decision to invest in the Kerf machine more pertinent. Rob Watts explains: "The movie studios were leasing buildings or temporary structures and the lead times could often be up to 12 months. In some instances, studios looking to use existing buildings would have to endure the laborious local authority planning application process. As soon as studios realised that we could design, manufacture, deliver and construct a temporary building in a matter of weeks and not months and then remove the structure upon completion of filming, the movie studios were intent on securing our services. We have just delivered a 20,000 sq ft Netflix building in less than 10 weeks. At the Shinfield studios in Reading, they had a six month head start on us and now we are 18 months ahead of



their schedule. This is the speed of delivery we can now offer with the help of the Kerf RUR2500."

Rob Watts concludes: "We are delighted with the Kerf machine. From day one, the sales engineers were knowledgeable and interested in our business and applications and it wasn't just about the sale. This duty-of-care has been carried through every step of the process and now the machine is installed, the service is unparalleled. It really is a great machine."

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# Pioneering robotic welding

At the cutting edge of robotic welding and welding systems into the industrial engineering sector

Automating the welding process and employing robots enables manufacturers to achieve significant returns across several areas: application precision, speed and agility of task execution, waste reductions and increased safety. The skills gap is also driving the take-up of automated robotics, as a means to sustain legacy manufacturing processes and support operational resilience.

DesignPro and KUKA have partnered since the inception of DesignPro's robotic welding provision. KUKA required a company with an established skillset that could pivot into robotic welding, whom they could support through expert staff, equipped with existing robotic welding experience, and high-quality automation hardware and software that caters to the needs DesignPro's welding customers.

Redmond McDonnell, DesignPro CEO says "KUKA delivers a very high-quality product and because of our model as a company, we are able to deliver a high-quality item at the right price."

The welding cell currently in development at DesignPro features a KR8 CYBERTECH industrial robot, mounted on a KL250 linear track. The back-to-back system utilises two KP1 HC positioners: a one-ton and a two-ton. DesignPro specifically chose the KR8 CYBERTECH robot owing to its reach capabilities and its repeatability. The positioner allows DesignPro to overcome accessibility constraints when it could be difficult to access certain areas. It also allows the pioneers to address horizontal welds, as well as vertical using the FRONIUS power source and supports different settings and different programs.

Fergal McGinley, technical and business development for robotics adds: "The reason



we choose to work with FRONIUS is because of its product offering and its position as a market leader. We've undertaken a lot of work with them in the past and find their after-sales service and support excellent."

DesignPro is a KUKA Ireland Platinum partner as Mark Elwell, head of robot sales, Ireland explains: "The support we get from them is not just as a result of their basic robotics knowledge, or their expertise in the field of digital simulation, but there's a depth of knowledge in automated arc welding, which is of vital importance when you're looking at commissioning an arc welding cell. We've developed an established relationship with DesignPro over four years now. It enables us to develop collaborative projects owing to our combined knowledge within the field of arc welding, supported by a wealth of knowledge in the UK and at HQ, in Germany, that we can call upon to assist DesignPro if required."

sets across welding and robotics and apply them within their robotic welding division, bringing together key skills into the market that suit the needs of their customers.

Redmond McDonnell says: "There's a clear skills gap across welding at the moment, so welding isn't necessarily an industry that millennials and Gen C see as appealing career paths, compared to the new technologies coming to the fore in the world. Some of our customers just can't get the right skills on the ground for their products. What our customers really need is a solution that can maintain volume and output but also have a consistency of weld for their product, which a robotic welding platform can deliver.

So how are DesignPro addressing the skills shortages that exist across Ireland and further afield? Mark Elwell concludes:

"DesignPro's training facilities takes current manual arc welders and develops them into robotic welders. But in doing so they're also taking on the younger engineers and developing them not only into arc welding engineers but instilling an interest in robotics as well. We can make the welding process a cleaner job for existing welders, addressing the quality of the welds and the consistency of the welds."



DesignPro has hired a qualified welder and trained them in the art of robotics. They also took a key robotics and service technician and trained them up in core welding experiences, so they can marry both skill

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TIG cold wire welding

# Dynamic Wire

Simplicity to unleash  
your welding potential

The innovative advantage of Fronius TIG DynamicWire, when compared to a conventional continuous wire feed in cold wire systems, lies in its automatic self-regulation. The power source actively adjusts the wire speed to the welding behaviour, torch position and current conditions - even compensating automatically for component tolerances of up to 30%. The result? Perfect welds every time. Existing iWave cold wire systems can be easily upgraded with the patented TIG DynamicWire Welding Package through software activation.

Call us for a demonstration: 01908 512300



For further information, visit:  
[www.fronius.com/tig-dynamicwire](http://www.fronius.com/tig-dynamicwire)

# Cold wire TIG welding – smart and simple

TIG cold-wire components are available now for Fronius iWave. The pioneering innovation lies in its intelligent control. With the patented new TIG DynamicWire welding package, even amateurs can achieve perfect TIG welds with ease. This is because the dynamic wire control always selects the right travel speed. The process adapts to the welder, not the other way round.



The new Fronius cold-wire components for iWave are lightweight and ergonomic, providing a lot more flexibility for TIG welding

TIG welding represents the top tier of welding processes and demands skill as well as years of practice or does it? "All the new features that we've packed into the iWave cold-wire components as well as the corresponding software solution make TIG welding significantly easier," explains Manuel Ruml, head of strategic product management for industrial welding solutions at Fronius International GmbH. "Thanks to TIG DynamicWire, welders can focus all their attention on the arc and the welding system regulates the optimal wire speed at all times."

The iWave power categories from 300i to 500i can be upgraded to the TIG cold-wire system. The TIG DynamicWire welding package is ready for use immediately by means of software activation and can also be retrofitted to existing iWave systems at any time.

The innovative advantage of Fronius DynamicWire compared to a conventional

continuous wire feed lies in its automatic self-regulation. The welding system actively adjusts the wire speed to the welding behaviour, torch position and current conditions, even automatically compensating for component tolerances of up to 30 percent. The result? Perfect welds every time.

During development of the cold-wire system, no detail was too small for Fronius when it came to ensuring that welders could work optimally with minimal steps and adjustments. The wirefeeder is set once and then remains in a stable position. The ergonomic and flexible tungsten holder is particularly lightweight as it is produced using material-saving aluminum 3D printing. There are also no disturbing vibrations at the torch handle as, unlike with comparable solutions, the mechanical forward and backward motion of the wire has been dispensed with entirely with the new TIG DynamicWire cold-wire welding process.

With the Tungsten Fast Clamp system (TFC), welding expert Fronius is bringing out another new patent. A single touch of the button releases and clamps the tungsten electrode in the spring-loaded clamping sleeve. Like the lead of a mechanical pencil, the electrode is changed in a matter of seconds. This system can now also be mounted on existing torch bodies.

In times of skills shortages, iWave



Self-regulating automatic wirefeed via the TIG DynamicWire welding package. Simply download the software and start welding

complete with cold-wirefeeding and TIG DynamicWire can help all TIG novices and those with less experience achieve a great welding result and fast. Self-regulating parameter settings and characteristics as well as a compensatory active wirefeeder provide the necessary safety and ensure a high level of quality.

Since the wire does not continuously move back and forth during intelligent TIG cold-wire welding, even wear parts such as the torch body, torch cap and clamping sleeve experience reduce abrasion and last longer than comparable solutions.

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The patented TFC electrode clamping system releases and clamps the tungsten electrode at the touch of a button, allowing it to be changed in a matter of seconds

## QINEO ArcBoT from CLOOS

Across all industries, companies face the increasing challenge of finding qualified manual welders. The shortage of skilled workers and increasing labour expenses make this even more difficult. At the same time, the demands on quality, flexibility and efficiency are growing continuously. New solutions are needed to ensure competitiveness.

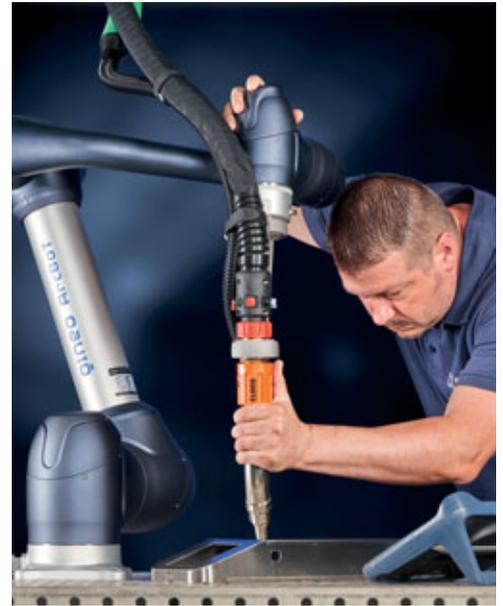
The Cobot welding system QINEO ArcBoT offers an easy entry into the world of automated welding. With the QINEO ArcBoT, users can weld even small batch sizes economically and with consistently high quality. The high-tech MIG/MAG welding power source and the very precise Cobot complement each other perfectly.

The compact "Ready to weld" package is delivered completely ready for operation. This guarantees a problem-free integration into existing production processes. A torque sensor in each axis allows the Cobot to be programmed and moved precisely. The intuitive operation significantly increases work efficiency. The user can make individual adjustments on the user-friendly

touch control panel with macros specially developed for welding. In addition, the Freedrive option with foot switch and the intelligent safety concept guarantee sensitive and safe control of the Cobot. Another special feature is the simple restart after an emergency stop as no extensive unlocking or free movement of the robot is necessary.

In addition to the relief of the employees, especially with monotonous, repetitive tasks, the users benefit from excellent welding results due to the consistent, reproducible quality. The integrated safety components ensure the necessary personal protection. As an option, the QINEO ArcBoT can be equipped with a torch-integrated welding fume extraction. In this case, an external extraction is not necessary.

CLOOS offers users a wide range of innovations for the economical automated welding of even small batch sizes. No matter whether its the new QINEO ArcBoT, the QIROX Compact Cells, the automatic programming system QIROX RoboScan or



the RoboPlan offline programming software, CLOOS supports users in finding their individual solution for welding small batches.

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 or contact: [kevin.kolkea@kuka.com](mailto:kevin.kolkea@kuka.com) 0121 585 0800

# Powerstir dual weld-head Friction Stir Welding machines from PTG

UK-based Precision Technologies Group (PTG) showcased its range of Powerstir dual weld-head Friction Stir Welding (FSW) machines at Aluminium 2022

Visitors to the show were able to discover first-hand how, since their launch a little over two years ago, how PTG's dual weld-head FSW machines have become a favoured choice among electric vehicle OEMs.

Designed specifically for use in the volume production of automotive battery tray floor assemblies from extruded aluminium panels, the company's dual weld-head process is aimed directly at manufacturers of skateboard chassis structures and ensures that a tight weld-flatness tolerance is achieved during battery tray floor construction.

PTG has been a leading name in the manufacture of friction stir welding machine tools for transport applications for more than 20 years, ever since its first Powerstir FSW machine was launched in 1998 and subsequently won the 2000 Metalworking Production 'Outright Winner' and 'Grand Prix' awards. More recently, however, PTG has used its considerable knowledge of the FSW process to assist automotive OEMs in producing lightweight, robust and aesthetic components for both Battery Electric Vehicles (BEV) and Plug-in Hybrid Electric Vehicles (PHEV).

## Ensuring a tight weld-flatness tolerance

A tight weld-flatness tolerance, as provided by PTG Powerstir dual weld-head machines, is essential to ensure that each EV battery cell sits perfectly level within its housing. The PTG dual weld-head method achieves an even and stable welding process, something that is made possible thanks to PTG's unique 'matched' dual-force control systems and balanced upper and lower head welding parameters. The result is exceptionally stable friction stir welding by both the upper and lower weld heads, producing matched weld seams with balanced heat input. This, in turn, minimises post-weld distortion and equips each welded assembly with a significantly improved flatness tolerance when compared to existing conventional single-side FSW methods.

"Our dual weld-head FSW techniques,



whereby both sides of an extrusion are welded simultaneously, not only remove the time-consuming process of lifting and turning extrusions between welds, but also allow for equal heat dispersion which results in minimal distortion," comments PTG sales director Mark Curran. "In the PTG Powerstir dual weld-head FSW process, typically four to 12 individual child-part extrusions are brought together for assembly. Following gantry loading, each extrusion is automatically positioned and clamped ready for friction stir welding, after which the partially completed vehicle component is automatically repositioned, ready for the next panel to be welded in place."

PTG is widely considered to be a leader in the development of FSW technologies for transport applications. Organisations involved in the manufacture of aerospace components and the production of aluminium carriage panels for high-speed trains were among the first to recognise the benefits of Powerstir friction stir welding.

Working with 5000 and 6000 Series aluminium alloys, and magnesium alloys from 3 mm to 6 mm in thickness, PTG is currently developing new FSW processes for several automotive OEMs. Through the use of industry standard CNC systems,

equipped with PTG Powerstir software, data-logging and interpolation technologies, 2D welding, guided by laser tracking, can be carried out on precise tool paths, with force control ensuring consistent welded seams. QR codes are used to identify each extrusion before welding commences. Each completed panel is then DMC coded to identify the panel, for complete and ongoing traceability throughout the manufacturing cycle.

## Coolant units and body panels

In addition to building Powerstir machines specifically for the production of battery tray floor assemblies, PTG is also creating FSW techniques for the production of coolant units, control box panels and car body panels, as well as body panels and components for commercial vehicles. Through its recently opened friction stir welding research centre, the company is also assisting a number of organisations in developing FSW processes for specific manufacturing challenges.

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