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- SAWING & CUTTING OFF

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Editor: John Barber - 01403 266022  
Email: [john@rbpublishing.co.uk](mailto:john@rbpublishing.co.uk)

Accounts: Jackie Barber - 01403 563791

Production manager: Anna Rodrigues - 01472 210712  
Email: [studio@rbpublishing.co.uk](mailto:studio@rbpublishing.co.uk)

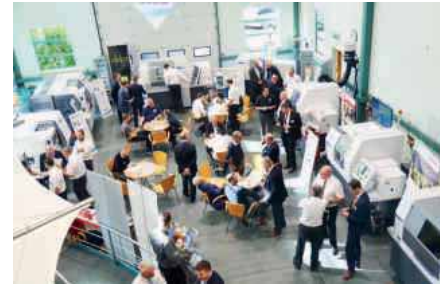
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## CITIZEN Open House to showcase 16 machines

Low Frequency Vibration (LFV) machining technology will be an important theme to customers at Citizen Machinery UK's annual Open House event being staged at its UK headquarters, in Bushey, between 16th



and 18th October. Amongst the 16 machines on view will be the UK launch of the LFV versions of the Citizen Cincom L32-VIII LFV sliding head turn-mill centre and the Miyano BNA-42GTYLFV sliding headstock turning centre.

In addition, Citizen will be demonstrating 5-axis machining technology on the latest Cincom D25-VIII sliding head turn-mill centre using the ground breaking latest Mitsubishi 800. It is a true 5-axis simultaneous machining control platform combined with Citizen's Cincom operating system.

As part of Citizen's progressive introduction of feeding the patented LFV technology across its range of Citizen and Miyano machines, the L32-VIII LFV and Miyano BNA-42GTYLFV's have been eagerly awaited to provide major advantages from programmable control of chip size on larger capacity machines from both stables.

Why progressive inclusion of LFV? LFV is fundamental in the machine design and is not achieved through simple macro programming. It is selectable at the machine control to provide rapid oscillation of the cutting tool creating, in effect, precise air gaps in synchronisation with the rotation of the machine spindle.

The Citizen L32-VIII LFV, with 38 mm bar size option and removable guide bush, can carry up to 30 tools. Both main, 7.5 kW, and sub-spindle, 3.7 kW, have 8,000 revs/min motors with 1 kW driven tools with 6,000 revs/min motors. Rapid traverse rates are fast at 32 m/min.

Adding LFV to the Miyano moving headstock hybrid BNA-42GTYLFV design, it features plain, hand scraped slideways on each axis with special ballscrews and roller bearings on the X1 cross feed to the headstock. Through the Cincom 'Superimposition' operating control software, simultaneous cutting with up to three tools can be achieved.

A further 18 companies will be supporting the Open House event covering CAD/CAM, tooling, quality, materials and machine accessories.

Lunch will be provided each day and, on Wednesday 17th, the Open House will be extending its visitor hours of 09.00 to 17.00 until 21.30 when all are welcome to the traditional Citizen curry evening.

While Citizen Machinery UK has an open invitation to all, to help with catering, those wishing to attend are able to register online at: [citizenmachinery.co.uk/open.house.event](http://citizenmachinery.co.uk/open.house.event) or telephone 01923 691500.

**Citizen Machinery UK Ltd Tel: 01923 691500**  
**Email: [sales@citizenmachinery.co.uk](mailto:sales@citizenmachinery.co.uk) [www.citizenmachinery.co.uk](http://www.citizenmachinery.co.uk)**



# Success and growth

## Mills CNC's half year results show no let-up in demand

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, has announced that machine tool sales in the first half of 2018 'have been "exceptionally strong". The headline news is that for the period January to June 18, orders for 240 new Doosan machines were taken by Mills.

These figures demonstrate the continuing popularity and 'pulling power' of Doosan machine tools, backed by Mills' range of best-in-class after-sales services, with component manufacturers, and provide the company with momentum as it moved into the second half of the year.

Kevin Gilbert, Mills CNC's managing director, says: "Clearly we are delighted



with the results. Over the last six months we have launched a number of new Doosan machines into the market. Many of these new machines like the Doosan DVF 5000, 5-axis machine, the Doosan DNM 4000, compact 3-axis vertical machining centre, the Doosan V8300M, vertical turning lathe, and the Doosan NHP4000/5000,



high-performance horizontal machining centre range, are already making a significant contribution to our sales performance."

Many of the new machine models, including the ones above, were exhibited by Mills at the MACH 2018 show in April. In total Mills showcased 16 machines on its stand and sold 20 machines during the week-long event.

Kevin Gilbert says: "We had a great MACH and we welcomed over 3,000 visitors onto our stand during the week. The depth and breadth of the Doosan range was clear for all to see on our stand, and to sell 20 machines during the event really was a tremendous result."

Prior to MACH sales of new Doosan machines, in the first quarter of 2018, were already 'on the up'. Since the event this upward trend has become more marked which demonstrates the importance of MACH, the momentum it creates and the impact it has on future sales.

### Turnkey

Over the last 18 months there has been a noticeable upturn in demand for Mills turnkey and process improvement solutions. This trend has continued throughout 2018 and shows no sign of abating.

Kevin Gilbert says: "Delivering often complex right-first-time turnkey solutions is a hallmark of Mills."

### After-sales services

Although the main headlines surrounding Mills' half-year performance naturally focus on machine tool sales, it is important not to lose sight of the company's 'other' business operations and the positive contributions they make to Mills' performance.

These operations, which include the company's CNC Training Academy, Mills

CNC Finance and Mills CNC Servicing all experienced steady and profitable growth in the January to June 2018 period.

In the second quarter the CNC Training Academy added 'new strings to its bow' and, in addition to its comprehensive range of FANUC, Heidenhain and Siemens CNC programmer and operator training courses, now offers spindle and table probing courses and Predator Software, machine tool monitoring and shop floor control technologies, training.

### Looking to the future

To maintain momentum throughout the second half of the year and beyond, Mills has its sights set firmly on the future. Constantly innovating and evolving, Mills CNC is committed to creating positive partnerships with a number of leading UK and Irish academic institutions and research organisations. As well as its continuing work with the AMRC (The Advanced Manufacturing Research Centre) and the Boeing Factory, both in Sheffield, Mills is also actively involved in collaborative projects with the MTC in Coventry and Queen's University, Belfast.

Working in collaboration is nothing new for Mills and, later this year, the company will be attending Seco Tools UK's two-day Inspiration through Innovation manufacturing best-practice event where it will be showcasing a new Doosan NHP 5000 horizontal machining centre.

Over the next six months new Doosan machine tool launches are planned. These include Doosan's latest mill-turn machine tools, the 6" chuck MX 1600/735 range, designed for machining small precision parts in one hit.

Kevin Gilbert concludes: "The first half of 2018 was an extremely busy and successful period for Mills, but there is no room for complacency. The plans and programmes we have put in place for the remainder of the year will, I'm confident, maintain our momentum and drive further growth."

### Mills CNC Ltd

Tel: 01926 736736

Email: [sales@millsncnc.co.uk](mailto:sales@millsncnc.co.uk)

[www.millsncnc.co.uk](http://www.millsncnc.co.uk)



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# Vert Rotors wins top Made in Scotland award

Vert Rotors, based in Edinburgh, has won the Innovator of the Year title in the Made in Scotland awards, for its innovative, patented conical screw compressors.

At the heart of the compressor are male and female conical screws which are manufactured to very tight tolerances. The new Vert Rotors Nautilus product packages this technology with the necessary motor, pipework and electronics to produce a plug and play desktop unit, designed for the future of disruptive technology. It is much quieter, more efficient, smaller and lighter than existing technology.

The Made in Scotland awards are sponsored by the University of Strathclyde and the Advanced Forming Research Centre (AFRC) recognising excellence in innovation, manufacture and the best new products developed in Scotland. The Innovator of the Year award recognises the most outstanding entry of all the winners of the different categories, making it a highly prestigious achievement for Vert Rotors.

The company now has two DMG MORI machines: the HSC 20 linear 5-axis machine and a CLX 350 universal turning centre with sub-spindle and Y-axis. The CLX 350 was added primarily to manufacture the casing for the Nautilus compressor which includes drilled and tapped features. However, the HSC 20 linear provides the essential technology required for producing the conical helix parts.

Oly Dmitriev, managing director of Vert Rotors says: "There are three factors involved in achieving the accuracy we need for the helix and these are: the machine tool, the tooling and the CAM program. We need to optimise all three for best results. To make this process even more complex, if we change one variable the others are affected. This leads us to a holistic approach to solving the problem.

"Six months ago, we were achieving  $\pm 10 \mu\text{m}$  while now we are achieving sub  $\pm 5 \mu\text{m}$  despite having changed the material of the parts from brass to 4140 alloy steel, which is much harder to machine. The key factors that help us to achieve such accuracy with the HSC 20 linear are the linear drives and its 40,000 rpm spindle speed. This machine allows us to manufacture with 100 percent repeatability and zero scrap, then move on from the development phase to production and shipping of products to



customers. Now we can minimise the quality sampling necessary to check that tolerances are achieved and also look at unmanned machining out of hours to expand our manufacturing capacity."

The iterative manufacturing development process involved testing many different cutting methods and customised tools with different coatings and took around 12 months to achieve.

Oly Dmitriev continues: "Our compressor technology is patented and the manufacturing process will be difficult to replicate, so we are a long way ahead of our competitors. We chose to manufacture the parts ourselves, as subcontractors would find it difficult to achieve what we have, and the whole design and development process would have been slowed down considerably. In that respect, DMG MORI has been a key partner in applying the technology."

Having achieved the  $5 \mu\text{m}$  tolerance, Vert Rotors saw energy efficiency of the compressor increase by a further 11 percent. The Nautilus is already 55 percent more efficient than conventional scroll compressors.

Oly Dmitriev explains: "We can produce

21-bar from a single stage compressor compared with 7-bar for conventional compressors. In addition, the air is class 1 purity. The Nautilus weighs just 35 kg and we are investigating ways of reducing this to 21 kg.

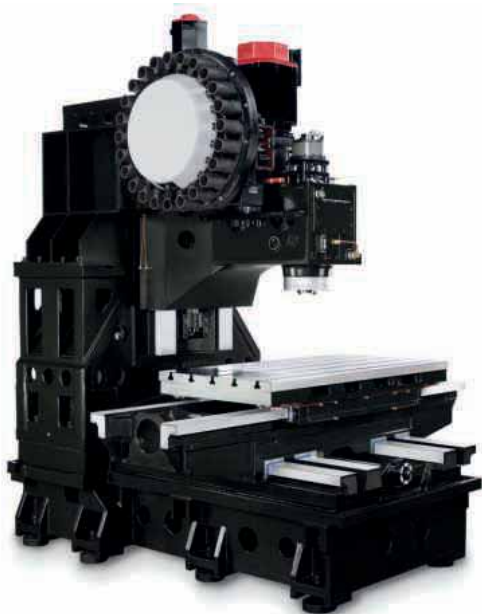
"Noise is a major factor for compressors and the Nautilus can be used in an office environment due to its low noise level. Essentially, the Nautilus is designed to meet the needs of trends for future manufacturing methods and locations, which are already becoming a reality with 30 percent yearly increases in the uptake of 3D printing technology.

"What we have achieved has been made possible following our partnership with DMG MORI. The company is highly professional, open to collaboration and the results we have achieved together are a source of pride. The Innovator of the Year, Made in Scotland award shows what can be attained with inspirational ideas, dedication and technology partnerships."

**DMG MORI UK Ltd**  
**Tel: 0247 651 6120**  
**Email: [steve.finn@dmgmori.com](mailto:steve.finn@dmgmori.com)**  
**[www.dmgmori.com](http://www.dmgmori.com)**

## New agent for WELE in the UK and Ireland

Whitehouse Machine Tools has been appointed, with immediate effect, sole agent to sell and service in the UK and Ireland the full range of machine tools manufactured by WELE Mechatronic. Founded in 2007, the Taiwanese firm produces vertical and horizontal machining centres with X-axis strokes up to 2,500 mm, B-axis and trunnion-type 5-axis machining centres with up to four metres travel in X, large bridge-type mill-turn centres with capacities up to 16 x 5 x 1 m, horizontal borers, and both horizontal- and vertical-spindle turning centres.



Tim Whitehouse, managing director of Whitehouse Machine Tools, Kenilworth says: "We are delighted to represent WELE and its wide portfolio of machines, which have won numerous awards at international machine tool shows. The group's product range greatly enhances Whitehouse Machine Tools' offering to British and Irish manufacturers and dovetails neatly with machines from our other principals.

"They include Japanese 30-taper turret machine producer, Brother; German machining centre and lathe manufacturer, Spinner; Taiwanese builder of mid-capacity machining centres, Averex; Italian CNC turning centre manufacturer, Biglia; and machining centre, grinder and automation system provider, Toyoda."

One of the latest new products to be introduced by WELE is the AA1165 vertical machining centre. It is a powerful, high accuracy machine that has undergone extensive hand scraping and offers a working volume of 1,100 x 650 x 600 mm.

Tim Whitehouse mentioned that the first one has been sold to a market-leading manufacturer in the UK of split valves for the pharmaceutical industry, complete with a tailstock and Kitagawa 4th CNC axis. Another has been ordered for stock at the agent's Kenilworth showroom and technical centre. Its website will be updated imminently to include the complete WELE machine range.

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# Are you ready to take a big leap?

Hexagon certainly is, as John Barber discovered when attending HxGN LIVE in Las Vegas

"Arrive curious and leave inspired," this was the message that Hexagon had for delegates in attendance at its annual digital solutions conference, held in June. 3,500 attendees, over the course of the week, from 70 countries around the world, would have certainly left impressed by the technology and stirring speeches that were a common theme of the experience. HxGN LIVE, is a four-day, annual event that welcomes thousands of business leaders from around the world who join together to experience digital solutions that improve productivity, and quality, across manufacturing, infrastructure, safety, and mobility applications.

The event allows attendees to engage first-hand with pioneering technologies, gain a unique perspective from the industry's top thinkers in educational keynotes and sessions, enhance their skills with interactive training and forge new connections that grow their professional network.

This year's conference was hosted at the Venetian hotel in Las Vegas, a suitably grand and inspiring setting. This world-renowned venue was the ideal place to absorb new ideas, network, and to meet industry peers.

### The importance of HxGN LIVE

Norbert Hanke, president of Hexagon Manufacturing Intelligence, said: "This is an event where we can engage with our



customers. It's a fantastic opportunity to demonstrate the capabilities of Hexagon. It is important for us to show these capabilities and to have discussions with our customers."

Steve Sivitter, CEO of VERO Software, said: "For the group, as we expand, it is really important for our customers to know the scope and the scale of the technology that we have available. One of the most important things is the problems that we can solve for customers across a wide variety of industries."

Brian Shepherd, CTO of MSC Software,

added: "The event brings together customers, partners, industry analysts and press all in one place, at one time, which is hard to do otherwise. It enables one to one conversations and it is great for networking. The relationships that are formed, the contacts that are made and the discussions that are had, all of this is hugely valuable and impossible to replicate in say a webcast."

HxGN LIVE brought together thousands of professionals to inspire forward thinking, disrupt the status quo, and accelerate innovative change across business and industry.

The conference presented an exciting line-up of breakthrough technologies driving Hexagon's Autonomous Connected Ecosystem (ACE) strategy, the delivery of industry-specific solutions that leverage sensing technologies, software, and data orchestration to create smart digital realities, where data is connected seamlessly through the convergence of the physical world with the digital, and intelligence is built in to all processes.

Ola Rollén, Hexagon president and CEO, said: "HxGN LIVE gets more exciting every year. Each conference becomes more diverse and packed with new and exciting innovations. We are proud to host change-makers from around the world whose visionary ideas and actions are moving industries forward in remarkable ways."



The conference officially opened with Ola Rollén's keynote address, where he inspired attendees to take that quantum leap forward as a next step in their digital transformation journey.

### The big leap

Addressing the audience on the opening night, Ola Rollén said: "Tonight, we are going to talk about the big leap. Big leaps make great things happen. You are going to have to jump, your organisation is going to have to take that great leap and it takes courage to take a great leap.

"IOT (Internet of Things) is an avalanche that is bearing down on all of us. It is going to change everyone's everyday work life. All industries are going to have to transform. There are no safe havens, it is not going to happen. What you need to decide is what are you going to do? Are you going to optimise the status quo or are you going to acquire the mindset to transform?"

"The need is constant, and we are always striving for better and better and better. There are going to be ideas coming through that will improve the things that we do, but these ideas are based on pillars of disruption. First of all, you need to understand what you are doing. You need domain expertise and you need to understand the industry that you want to disrupt. Then you need the disruptive force and you need the third cornerstone and that is technology that works. In our industry we need to add a fourth pillar and that is data. Data is entrenched in everything that we do in all industries. What we need to ask ourselves is data and technology are they in synch?"



"With IOT it is like opening the floodgates. Now you don't have people producing data, but you have machines and they never sleep. They produce data 24/7. In the past two years we have produced more data than has ever been done throughout the history of mankind and this is going to continue to accelerate.

"We need to find an accelerator, something that can propel us back to the same level as data creation, so we are in synch again. We need to change the flow of information and data. There is hope for us in the form of technology. We need much less data, but it needs to be enhanced, it needs to be visualised and it needs to be mobile. Now we have a system in harmony again and you could call this system an ACE (Autonomous Connected Eco-System)."

### Harness the power of disruption with Xalt

Xalt is a radical new approach for harnessing the untapped potential of IoT data. Xalt is a powerful framework for accelerating digital transformation, fast-tracking a customer's ability to fully leverage IoT data. The goal of Xalt is to create ACE, a state where data is connected seamlessly through the convergence of the physical world with the digital, and intelligence is built-in to all processes, from the core to the edge of a customer's network.

Xalt's framework leverages disruptive technologies that address the critical IoT points of leverage: enterprise integration, cloud orchestration, data visualisation, built-in mobility, intelligent edge connectivity and artificial intelligence (AI) everywhere. It is the cornerstone of Hexagon's ACE strategy: delivering industry-specific solutions that integrate sensors, data, and software to create smart digital realities.

Ola Rollén continued: "Tonight, we are going to talk about how we can make ACE a reality. This is Hexagon's big leap. This is our commitment to you. Tonight, we are launching something called Xalt. Xalt bears the promise to do exactly these things. If you look up the word exalt it means raised to a higher rank or position, and that is what we want to do. We want to accelerate back so that we are in synch with the data generation again. You will not be able to buy Xalt. Xalt is gradually going to be embedded into the products that you already use from Hexagon. In the next four or five years it is going to be a complete, wrap-around technology for all of our platforms, systems and products."





Norbert Hanke said: "I am a big believer in cyber physical systems where you make decisions on the lowest level. I need the data to create and use artificial intelligence to make predictive, maybe even prescriptive maintenance or answers and I need notifications, I need visualisations. Xalt is a wrap-around of these things. We are only just launching it and it will be developed further. There is a roadmap behind it of how it will work, and we are not selling it. Just to be clear is not a product launch, it is to a certain extent, a product and a vision and a mindset of where we want to go."

Brian Shepherd said: "From my perspective Xalt is all about data. It's a rich set of capabilities for data in the enterprise. Where data is created there is connectivity to those devices. There are capabilities for visualising the data, for making it mobile and for analysing it. The common thread is data. It's a set of components, that we call a framework, that allows us, inside of Hexagon and others that may be able to use it, to realise their dreams around data in the smart factory."

"Customers are drowning in data. They just have so much data from all of these machines, smart machines, but harnessing that is not easy. Xalt is really going to help them with that."

Ola Rollén added: "Perhaps the single greatest need in business today is autonomous insight. This means much more than operational line of sight, it means being able to leverage vast amounts of data behind the scenes, where connected devices and machines interpret what's happening and why, and then act accordingly autonomously. Customers need

to operate based on the whole picture, not just the big picture, something not humanly possible without the aid of AI and visualisation technologies.

"The promise of the IoT era has always been the vast amounts of useful data it generates. The challenge has always been our ability to put it to use. Now, with Xalt, our customers can not only transform more data into actionable information but also introduce active knowledge into industry ecosystems through autonomous processes and communications between machines. Moving forward, Xalt's framework will be used to build the foundation underneath all our solutions. So essentially, it will come standard."

By converging the digital and physical worlds of Information Technology with Operational Technology, Xalt will significantly accelerate a customer's ability to extract the full potential and value of IoT data across businesses and industry. Robust and scalable, the Xalt platform equips companies to quickly adapt to technology shifts and innovation, new business models, and changing market demands.

### Celebrating the past and looking to the future

The story of Hexagon Manufacturing Intelligence stretches back over 200 years and incorporates some of the biggest names in measurement and industrial metrology. This rich tapestry of experience, expertise and innovation forms a solid foundation for the development of new measurement technologies, integrated manufacturing solutions and process standards of the future.



Hexagon Manufacturing Intelligence's parent company Hexagon AB is continuously evaluating opportunities to strengthen the product portfolio, global footprint and service capabilities of the business through a combination of acquisition, collaborations with other Hexagon businesses and research and development driven innovation.

Norbert Hanke said: "Historically, over the last five or six years there has been a bigger and bigger acquisition in a totally different area. In 2005 it was Geo-Systems, in 2010 it was Intergraph and more recently MSC and VERO. Acquisitions will continue to happen in the future, I am pretty sure of that, but we are also focussing on our own developments and so it will be a nice balance moving forward. Whatever we see, when we think we cannot do it quickly ourselves, then we buy companies. It is always a make or buy decision."

"Our main expertise is manufacturing intelligence and with technology in design, engineering, production and metrology, we are uniquely positioned in this space. The concept of smart factories is about improving productivity. Here, at Hexagon Manufacturing Intelligence, we believe that quality drives productivity."

Brian Shepherd concluded: "We really need to re-think our perspective on quality. We need to change our mindset in terms of how we think about quality. It's not simply about inspecting a product and determining its specifications. Quality has to be built by the perceived value of the customer and we have to drive products to excite and delight customers."

"We have a unique portfolio, a broad portfolio with production software, with inspection and metrology quality software. Now, we have a unique opportunity to solve some problems for our customers."

**Hexagon Manufacturing Intelligence**  
Tel: 01952 681300  
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# The heart of metalworking beats in Stuttgart



Experts from the machining and metalworking industry will meet at AMB for the 19th time from 18th to 22nd September 2018. More than 1,500 exhibitors will present developments and innovations on a gross exhibition area of more than 120,000 sq m<sup>2</sup>. There is every indication that AMB 2018 will be the biggest AMB ever as around 90,000 international trade visitors are expected to attend the event in Stuttgart, Germany.

Ulrich Kromer von Baerle, CEO of Messe Stuttgart, says: "With the new Paul Horn Hall, Hall 10, the special AMB show "digital way" and the related congress, we have created ideal conditions to make AMB 2018 even larger and better."

According to Reiner Fries, sales director at Schwäbisch Werkzeugmaschinen GmbH, AMB is a magnet for visitors and exhibitors alike: "Southern Germany is the country's strongest region in terms of the production of machine tools and accessories. Every renowned manufacturer will be represented at AMB 2018. They will present genuine innovations and provide a good overview for investment decisions.

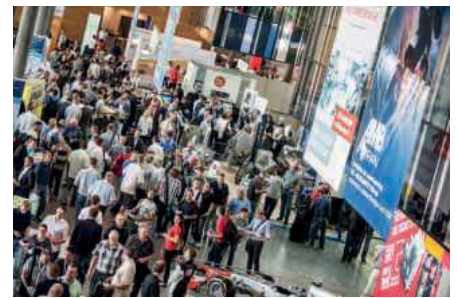
"AMB in Stuttgart is one of the most important exhibitions for our company since the entire industry meets there and the event therefore becomes an attraction for our target group. As the largest mechanical engineering exhibition in southern Germany, AMB is becoming increasingly more important due to its location in Stuttgart. It is the ideal counterpart to EMO. During AMB 2018 we will show our innovations from the machine portfolio in the area of universal machines and will present GROB automation solutions."

Jochen Nahl, sales director, says: "Industry 4.0 will be a key topic in the context of our latest GROB-NET4Industry applications."

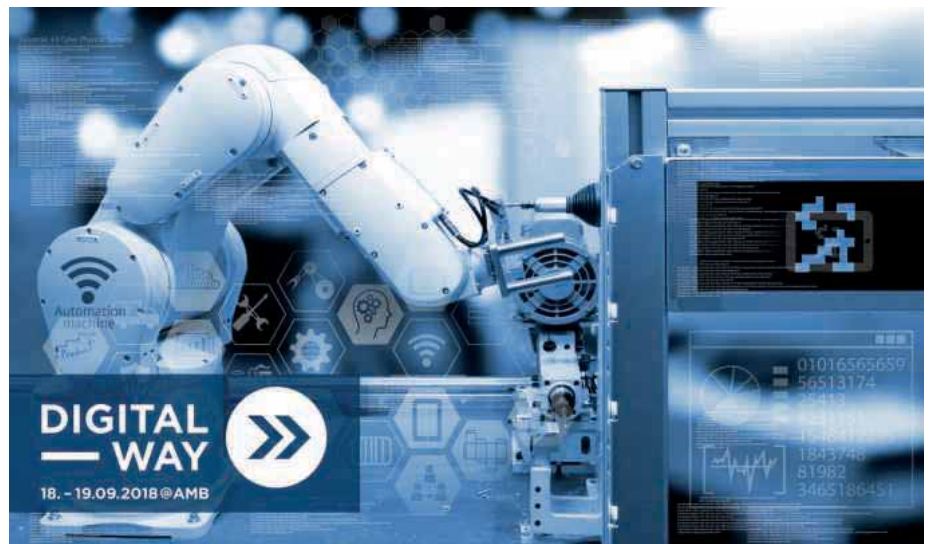
Sales manager Marcus Steudel also believes that now is the perfect time for

investments and digitalisation in production. He summarises the exhibition focus of Schneeberger Maschinen AG as follows: "We will show the technically future-oriented level of grinding technology both from the aspect of mechanical engineering and in regard to the man-machine interface and will present the entire range in our capacity as the manufacturer with the world's largest spectrum of 5-axis grinding machines.

"The metal cutting industry is faced with major challenges at present. We believe that AMB, as the leading exhibition in the metalworking industry, has the potential to provide fresh impetus for positive growth in sales."



important marketplace for Europe. Every world leader in metal cutting will also again be present at AMB 2018 in Stuttgart while visitors will be able to experience hundreds of machines live in operation. The good news is that the economy couldn't be better. Important sales markets in Europe are



## More exhibition space, more innovations, more contacts

In the past all the capacities of the trade fair grounds were exhausted. This won't change either in 2018 despite an increase in the amount of exhibition space. Ulrich Kromer von Baerle says: "An additional 15,000 sq m<sup>2</sup> will be available in the new Paul Horn Hall. We will therefore be able to satisfy the demand by exhibitors and also make the event more attractive for visitors by presenting even more products and innovations.

## Boom phase continuing in 2018

While in autumn, every two years, manufacturers present their innovations for North America in Chicago and for Asia in Tokyo, AMB in Stuttgart is the most

currently in a boom phase. Economic experts are predicting that gross domestic product in Germany and the eurozone will rise by 2.2 percent and 2.3 percent respectively in 2018.

Gunnar Mey concludes: "Exhibitors have confirmed to us that the capacities in industry are currently running at the highest level since 2008. Now would be the right time to make necessary investments. AMB provides a unique platform in this respect since exhibitors present the latest state of the art here and show what is now possible in regard to digitalisation in production."

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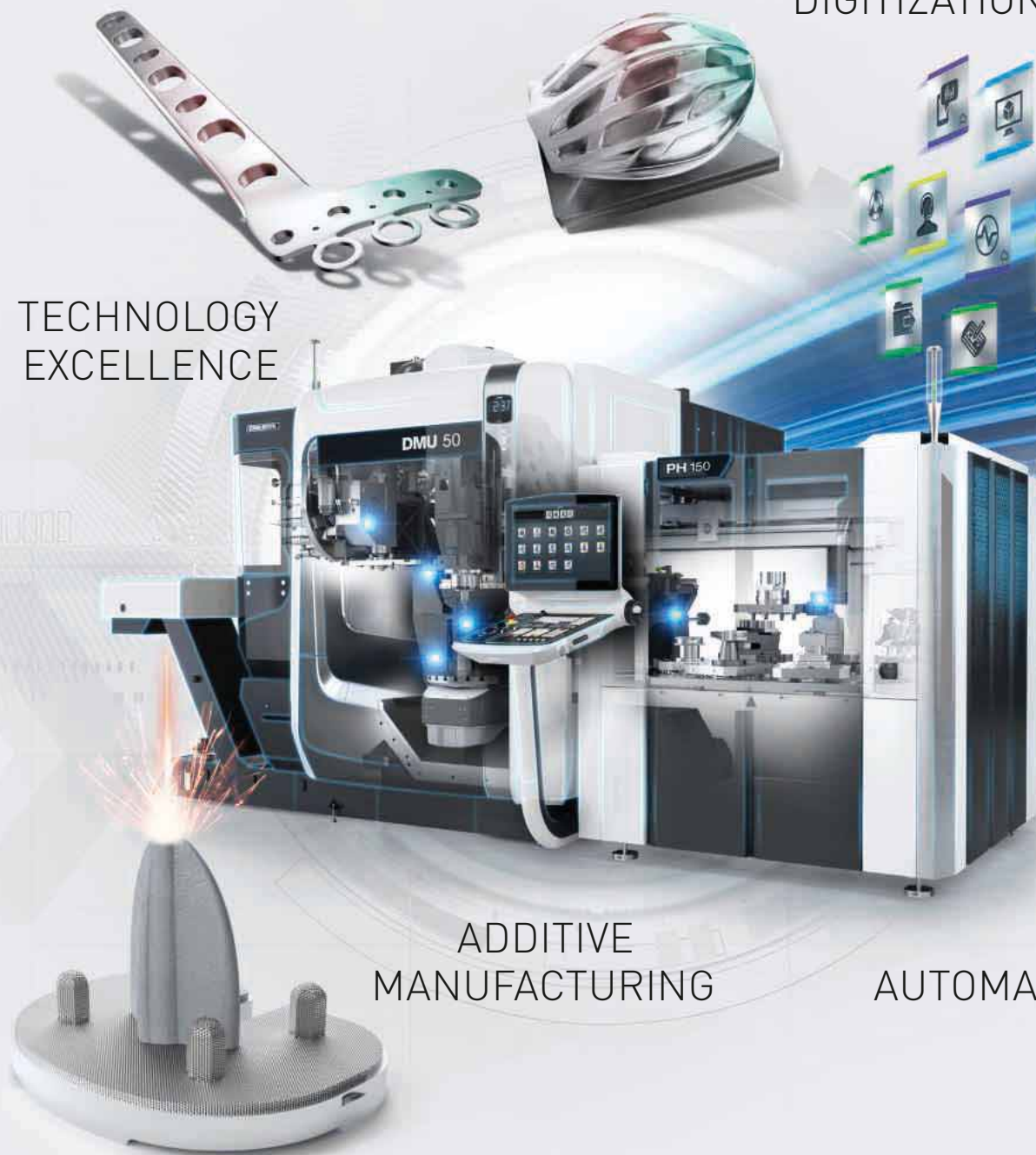


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# DMG MORI



# Shaping the future of manufacturing at AMB

## Sandvik Coromant showcases new paths to success in Stuttgart

At this year's AMB exhibition, Sandvik Coromant intends to show how customers and partners can achieve significantly higher productivity levels, more flexible machining processes and more sustainable production under the strapline 'Shaping the future together'. The global specialist in cutting tools and tooling systems will be revealing how it is revolutionising the world of turning, improving the entire manufacturing process with digital connectivity solutions and offering fascinating possibilities for the automotive and aerospace industries.

On its stand, the company will present digital solutions designed for smarter machining and greater manufacturing efficiency. These innovations will include CoroPlus® ToolGuide, which provides fast and precise tool recommendations for the specific operation and material type, as well as CoroPlus® ToolLibrary, which enables users to integrate tool assemblies directly into their digital machining environment. Along with software that helps improve design and production planning, the company will showcase networked tool and process-control solutions.

Trade visitors can also discover the latest technologies in the fields of turning, milling and drilling at the 375 m<sup>2</sup> stand. Included will be turning solutions such as CoroCut® QD for cutting with the Y axis. CoroCut QD uses the potential of modern turning centres and multi-tasking machines to guide the tool in the Y direction, positioning the upper side of the indexable insert parallel to the end of the blade. This capability enables faster feed speeds and the machining of longer overhangs without loss of stability.



Also, being promoted at the show will be the PrimeTurning™ process for turning in all directions. Manufacturers in the automotive and aerospace industries, in particular, can benefit since PrimeTurning is extremely versatile. Indeed, the process is suitable for turning short, compact components, for longitudinal turning, and for machining contours and front-end geometries.

Josse Coudré, sales manager for Central Europe at Sandvik Coromant, says: "We are looking forward to another great AMB because this trade show always offers an excellent opportunity to meet customers and partners personally in order to optimise future cooperation. We are proud to present our high-end solutions in Stuttgart, all of which are designed to help manufacturers become more efficient, productive and profitable."

Thanks to numerous cooperations with machine manufacturers, including being a co-exhibitor on the DMG MORI stand, solutions from Sandvik Coromant will be on display in many places around the exhibition. Sandvik Coromant is also one of the sponsors and speakers at the special two-day AMB show 'Digital Way 2018 – Digital Paths in Production'.

The Sandvik Coromant service team will again support and advise customers before and during AMB. A five-man technical crew will be available one week before the start of the trade fair in **Hall 5, Room 5.3**.

### Innovative solutions

If you are looking for advanced tooling solutions for turning, milling, drilling, manufacturing top-grade components or tooling concepts for the automotive and aerospace industries, Sandvik's experts are looking forward to seeing you at AMB 2018. Digital solutions enable not only the connection of design, planning and metal cutting but also effective process analyses and improvements. Our CoroPlus solutions make you ready for Industry 4.0. It allows the



linking-up of the different process steps, operations planning, process planning and machining as well as the extended production analyses in order to secure a more profitable and sustainable production.

### Smart innovation for maximum productivity

Most machines offer tremendous performances, however, sometimes suitable processing methods or tools to successfully exploit their maximum levels of potential are lacking. With PrimeTurning™ and CoroCut QD for Y-axis parting, Sandvik Coromant has created groundbreaking solutions that take turning to the next level.

Company experts would be happy to advise how you can improve on flexibility, productivity and tool life with CoroTurn® Prime. PrimeTurning™ allows you to perform longitudinal, forward and reverse, face and profile turning with just one tool. Here you have a unique competitive advantage.

The combination of innovative process methodology and reorientation of the resulting cutting force significantly improves the stability of the tool on the CoroCut for parting off with the Y-axis. Find out from the experts at AMB how this new process methodology can increase your productivity and process reliability.

### Sandvik Coromant

Tel: 0121 5045400

Email: [uk.coromant@sandvik.com](mailto:uk.coromant@sandvik.com)

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Hall 1 - Stand 1E50

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# New tools, inserts, dispensing machine and digital technologies at AMB

Walter AG, one of the world's leading metalworking companies, will be announcing a host of tooling innovations at AMB, all designed to improve productivity and boost users' profitability.

In addition to new solid carbide drills, new indexable inserts for turning and new thread milling inserts and cutters, Walter will also have on show a new tool dispensing machine, examples of its digital solutions for medium-sized companies and, in a world first, a new generation of tooling which the company says will bring benefits in multiple areas of applications.

While details of the new tool generation are being kept under wraps until AMB opens its doors, Walter AG Chairman Mirko Merlo says at the show the company will reinforce its policy "of supporting customers throughout the entire value chain with digitisation solutions and innovative precision tools."

Visitors to the stand will be able to discuss customised process optimisation and digitisation solutions that allow plug-and-play installation to address the production challenges faced by medium-sized companies, including the Comara appCom production assistance system.

Able to be configured in just under an hour, appCom analyses and visualises machine data in real time and actions the appropriate optimisation procedures.

In addition, visitors can also hear about the Comara iCut software tool, that measures spindle output at up to 500 times per second then, in real time, automatically adjusts the feed to suit current cutting conditions.

Also, on show at AMB will be a new tool dispensing machine, which can be configured and expanded on a customer-specific basis. Walter can also provide customer-specific tool management solutions, from simple tool dispensing through to component cost concepts.

Another launch at AMB will be new indexable insert thread milling cutters and a new thread milling cutter insert with D61 geometry, to increase the ability to produce different thread pitches and lengths.

The T2713 single-row thread milling



cutter ensures good chip evacuation and prevents the tool being deflected from its course by chips. The process produces perfectly cylindrical threads, even where there are large overhangs. The multiple-row variants T2711 and T2712 are designed for maximum productivity by processing multiple thread sections in parallel.

Made from an extremely fine-grain titanium carbon-based cermet substrate, the new WEP 10 indexable inserts for turning will also be making a debut. The new substrate not only results in longer tool life than conventional carbide but it also minimises fluctuations in dimensions. WEP 10 inserts produce mirror-finish surfaces.

Adding to the new tool announcements, a range of solid carbide drills in the advance product range have universal use in all ISO material groups and for various applications with all machine concepts. With these, a new end-face geometry facilitates chip-forming, primarily with soft materials, and a steep pointing angle enhances both precision and hole quality.

Walter AG was founded in 1919 and is now one of the world's leading metalworking companies. As provider of specialised machining solutions, Walter offers a wide range of precision tools for milling, turning, drilling and threading applications. Walter 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. The company demonstrates its Engineering Kompetenz at every stage of the machining process. As an innovative partner capable of creating digital process solutions for optimal efficiency, Walter is pioneering Industry 4.0 throughout the machining industry. With over 3,500 employees worldwide, together with its numerous subsidiaries and sales partners, Walter AG serves customers in over 80 different countries.

Walter stands for solutions that mark milestones in machining, helping you reach your goals right on target more rapidly and reliably. Solutions that make your projects more efficient and effective.

**Walter GB Ltd**  
**Tel: 01527 839450**  
**Email: [ria.kalia@walter-tools.com](mailto:ria.kalia@walter-tools.com)**  
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**Hall 1 - Stand 1H30**

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# Always the right cut

KASTO will present numerous innovations at AMB and visitors can look forward to the completely new KASTOmiwin bandsaw series, more new models for the KASTOmicut workshop saw family and the completely revised high-performance saws in the KASTOtec series. Proven solutions such as the universal sawing machines of the KASTOwin family, the UNITOWER compact tower storage system with energy recovery and the KASTOspeed circular saw with robot connection will also be on display.

With the KASTOmiwin, which premiered at KASTO FutureDays 2018, the Achern-based company is supplementing its range with a brand-new double mitre bandsaw for cut-to-length and mitre cuts between -45 and +60 degrees. Initially available as a semi-automatic KASTOmiwin U 4.6, and an automatic A 4.6 version, the KASTOmiwin is designed especially for parts cut to size in steel construction, the steel trade, plant construction and special machine construction. KASTO will also be offering the swing-frame bandsaws of the KASTOmicut series, especially designed for use in workshops. Users can choose between manually-operated, semi-automatic and fully automatic variants, and now they can select different cutting areas too, as KASTO has added three new models to its range.

KASTO will also be introducing something new in the field of high-performance saws for large series, as the saw specialist has comprehensively revised its KASTOtec range of bandsaws. Here the company's designers focused on the best possible use of carbide saw blades. Using the intuitive control system, the operator can adjust all the parameters to match the type of bandsaw blade used. Depending on the blade, this can reduce cutting time by up to 50 percent. Another feature of the new KASTOtec is KASTOrespond. This intelligent system continuously records the forces on the tool without additional sensors and converts them into the optimal digital feed rate. This results in maximum performance which is also gentle on tools.

The saw technology company will also be showing the KASTOspeed, a high-performance automatic circular saw designed for cost-efficient mass production. This saw also excels in continuous operation thanks to its reliability and excellent results;



and a robot link can also be used to easily integrate KASTOsort into a uniformly-controlled material flow. The KASTOspeed is available in two versions: for steel and for non-ferrous metals. Users can also choose between two sizes, with a cutting range of 90 or 153 mm. The universal KASTOwin bandsaw will also be showcased at the exhibition. This successful range convinces users with its extensive standard equipment and an attractive price-performance ratio. The KASTOwin bandsaws offer a productive and economical solution for the mechanical engineering, toolmaking, steel trading and automotive industries, the aerospace technologies sector and many more.

Visitors to AMB, that are interested in the world of storage technology, will see KASTO demonstrate the advantages of its

compact UNITOWER tower storage system. This system is available in two different versions: UNITOWER for the storage of long workpieces and UNITOWER B for sheet metal, flat products and containers. The tower storage systems are designed as modular systems, so customised solutions can be realised with ease. Cassettes, pallets or supporting frames are used as the load carriers. Thanks to their variable loading height, these tower storage systems can save much more space and are consequently more economical than conventional floor and cantilever storage systems. The UNITOWERS are also characterised by their high level of efficiency. The load carriers are handled by a Storage and Retrieval Machine (SRM) an operating gantry crane with a central crossbeam loading traverse. Together with the superbly-efficient drives, this ensures fast access times and saves energy. The advanced conveyor systems, and processing machines, can also be used to connect storage and retrieval stations fully automatically, ensuring a highly-efficient and smooth internal material flow.



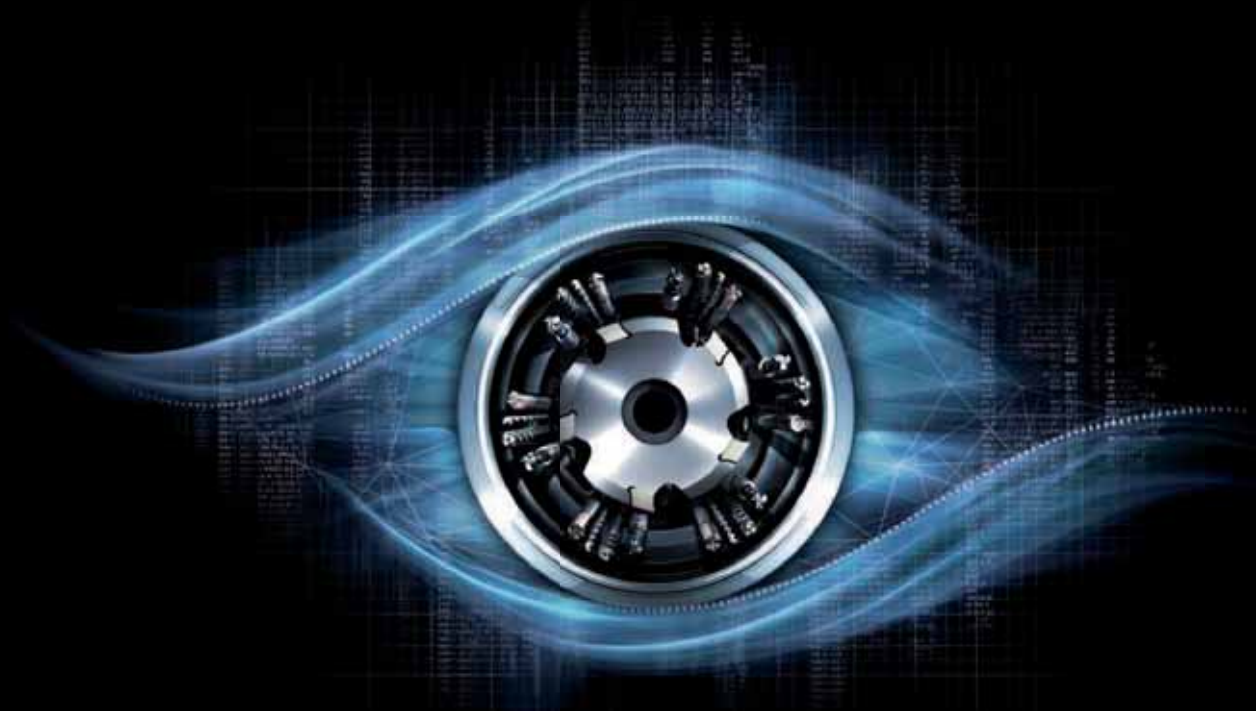
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**Email: sales@uk.kasto.com**  
**www.kasto.com**

**Hall 8 - Stand 8B11/8B12**



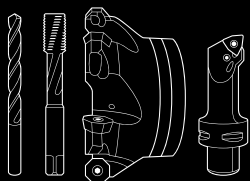
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# DMG MORI to promote integrated digitalisation at AMB

Integrated digitalisation for Industry 4.0, holistic automation solutions, additive manufacturing, and technology excellence in the die & mould and medical sectors will be presented on DMG MORI's stand in Hall 10 at the AMB exhibition this year.

For Industry 4.0, the core topic is the proprietary CELOS app-based interface for mapping digital workflows. There will be a new production planning system that can optimise value creation by continuously and digitally planning and monitoring fundamental workflows and processes in manufacturing. There are modules for material management, personnel deployment, detailed production planning and order tracking.



DMG MORI will also showcase NETservice, which includes a new SERVICEcamera and IoTconnector. This is a tool for remote servicing via a multi-user conference and enables direct collaboration between users, service technicians and other experts in a communication network designed to facilitate joint solutions to service issues. Everyone involved in the maintenance and repair process can be networked with one another with the help of the web-based and manufacturer-independent platform, WERKBLiQ.

Thirteen of the 32 DMG MORI machines at the exhibition will be exhibited with automation and, every 30 minutes there, will be demonstrations of digitalisation and automation highlights in the 'digital factory' area of the stand. There will, for example, be a PH 150 pallet handling system on a CMX 800 V vertical machining centre, a DMU 50 3rd Generation vertical machining centre with a WH 15 workpiece handling device, and an NHX 5000 horizontal machining centre with RPS 14 rotary pallet storage.

For automating lathes, a second



generation Robo2Go will be demonstrated. The flexible robotic solution for CLX and CTX series turning centres features new software. Using pre-defined program modules, processes can be created quickly and easily, even without any prior robot programming knowledge. The process of teaching-in a new program can be completed in just 15 minutes, robot operation then taking place via the machine control system. New gripper geometry has a reduced interference contour and higher load capacities of 10 kg, 20 kg or 35 kg.

Joint venture company DMG MORI Heitec GmbH acts as automation partner, focusing on customised workpiece handling systems and automated pallet handling, the latter being much in evidence in the group's own production plants.

Manufacturing expertise for the die & mould and medical industries will be a focus of attention at AMB, as DMG MORI regards both as growth drivers in the machine tool industry. The company has been supporting users in these sectors with practical experience and specialist know-how for decades.

The Die & Mould Excellence Centre at group factory Deckel Maho Pfronten makes use of a wide range of machines, from monoBLOCK and duoBLOCK machining centres and LASERTEC 3D machines for additive manufacturing, which is becoming increasingly important, to the XXL range of very large machining centres. Deckel Maho Seebach is one medical excellence centre location, as it is a production plant for high-precision DMU eVo linear machines and for the high-speed MILLTAP 700 compact machining centre.

DMG MORI will highlight at AMB the latest generation of the successful LASERTEC 75 Shape. High quality, geometrically defined surface structures, fine contours and filigree cavities can be produced for the manufacture of injection moulds and press dies with maximum process reliability and reproducibility.

Z-axis travel has increased from 1.5 m/s to 4 m/s, while a new, optional, high-speed focusing system, and up to 1,000 kHz pulse frequency, allows texture quality to be optimised at high process speeds. The results are up to 69 percent shorter processing times and hence lower production cost per component.

The dynamic LASERTEC 75 Shape combines the stability benefits of the monoBLOCK design with the advantages of challenging 5-axis machining with the NC swivelling rotary table. With a footprint of 7.9 square metres and a 750 x 650 x 560 mm working volume, it is the most compact machine in its class. Maximum workpiece dimension is 840 mm diameter by 520 mm.

Additionally, in the field of additive manufacturing, DMG MORI will be showing four complete process chains for powder bed and powder nozzle production.

**DMG MORI UK Ltd**  
**Tel: 0247 651 6120**  
**Email: [steve.finn@dmgmori.com](mailto:steve.finn@dmgmori.com)**  
**[www.dmgmori.com](http://www.dmgmori.com)**

**Hall 10 - Stand 10C11/10C31/10D01/  
10E11/10E31**

## Complete range of turning machines at AMB

Colchester Machine Tool Solutions is exhibiting a complete range of turning machines with its distributor, Haberstroh GmbH & Co. KG, at AMB.

Alongside regular favourites, such as the Colchester Student centre lathe and the Harrison Alpha manual/CNC lathe, will be the brand new range of CNC turning centres, the Colchester Typhoon. Recently launched in April, at the MACH 2018 exhibition, the Colchester Typhoon has already created great interest with orders now being taken.



The new Typhoon series introduces Colchester's next generation of CNC turning centre, following on from the highly successful Tornado range. The Typhoon range offers exceptional cutting performance and highly accurate component finish at every stage of your operation.

Colchester offers new Typhoon models as a choice of either linear, L series, or heavy-duty, box way, B series, turning centres, all available with variations of 2-axis, c-axis, subspindle and Y-axis functions in a range of bar capacities to suit all turning applications from 45 mm up to 165 mm spindle bore.

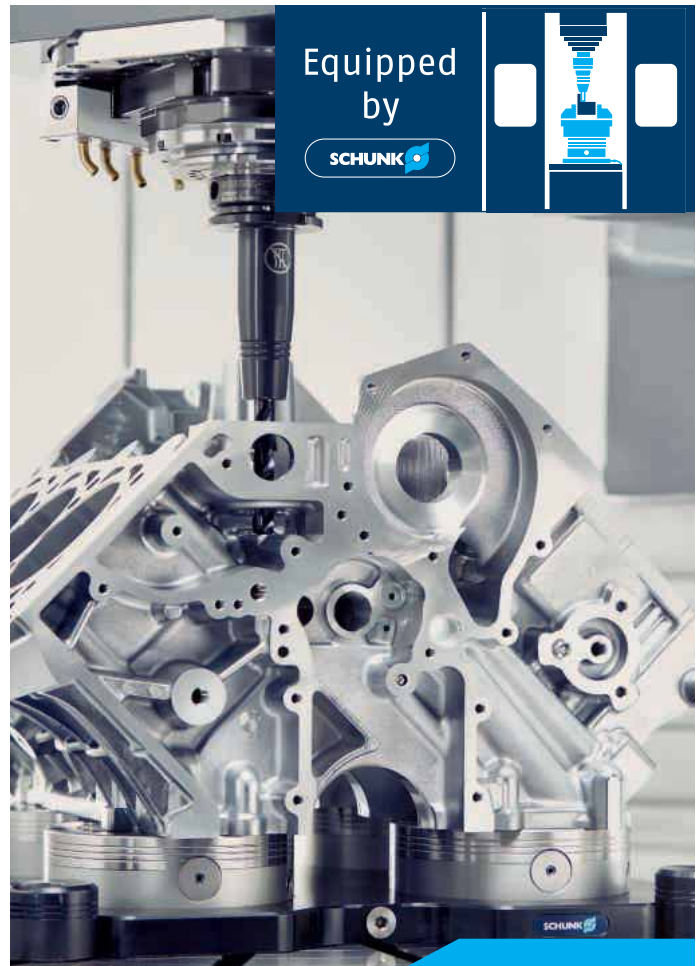
All Typhoon CNC turning centres are fitted with the latest FANUC Oi-TF control system with Manual Guide i and are all manufactured with a one-piece cast iron base with a 30° slant-bed design. It provides a low centre of gravity, and a better ergonomic design, maximising precise cutting regardless of your component complexity.

Additionally, the new Typhoon models come packed with a huge amount of options for customers to get the best out of any complex machine tool requirements.

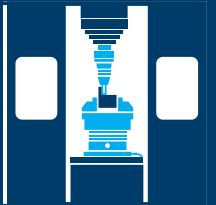
Paul Rushworth, Colchester Machine Tools sales director, concludes: "AMB is one of the highest profile European shows in the machine tool calendar and after considerable success in the UK, Spain, Russia and Austria already this year, we are looking to continue that trend with AMB Stuttgart and demonstrating the new Typhoon capabilities directly from the stand.

**Colchester Machine Tool Solutions Tel: 01924 415000**  
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**Hall 9 - Stand 9D12**



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# LACH DIAMANT reflects on the past and looks to the future at AMB

Horst Lach, chief executive officer and general manager of Jakob Lach GmbH & Co. KG., looks back on the the first twelve months after introducing the first polycrystalline cutting tools

Where do we come from and what is our destination? This was the question after the first introduction of this new cutting material Polycrystalline Diamonds (PCD) at the Hannover Trade Show in 1973.

Despite the word poly, the basis here is diamond, naturally created from carbon in the depths of the earth under heat and pressure over millions of years. Diamond, in its monocrystalline form, is still the hardest of all things. Even before people discovered its beauty, they made use of the hardness of this indomitable material in the earliest archaeological sites in India, for the turning and levelling of mill stones.



The industrial revolution, starting in England around 1770 and its powerful continuation in Germany in the mid 19th century would not have been possible without diamonds. They were instrumental especially for the production of steam engines and locomotives. More precise grinding machines, studded with wheels for steel grinding, had to be developed, and without diamond dressing tools, only geometrically distorted surfaces would have



resulted. The demand for natural diamonds, from Brazil and Africa, skyrocketed during the following 100 years and gained strategic importance due to both World Wars.

It is no surprise that in 1954 engineer Tracy Hall was the first who succeeded in growing synthetic "man-made" diamonds in the United States, using a specially developed high-pressure press.

Once again, it was Tracy Hall who, in 1967/68, implemented the idea to bake very fine diamond grains with carbide as a carrier material during synthesis. He was successful. The first step towards a so-called polycrystalline synthetic diamond cutting material had been accomplished. Electrical Discharge Grinding (EDG), for dividing the round plates which at first had a diameter of approximately 3.2 mm, had not yet been discovered. Therefore, the carbide had to be scored with electro-plated diamond cutting discs in order to be able to break off either 90 or 60-degree segments afterwards.

What to do with this new innovation? General Electric's management must have been faced with the same question at that time. Nevertheless, the up-and-coming managers under the leadership of Louis Kapernaros must have prevailed within the big GE family. It was decided to provide samples of the new cutting material to three or four selected diamond companies, including LACH DIAMANT. Apparently, GE was curious to see whether the company, known as "Borazon Pioneer" since the introduction of the CBN grinding wheel in 1969, would once again come up with a lot of new ideas.

It was in the spring of 1974, shortly before the Hannover Trade Show, the second year after the first PCD presentation. Since the introduction of PCD for manufacturing copper commutators, we had practiced PCD turning instead of grinding and had tried to win new customers among aluminum processing companies such as Westinghouse, Voith, Solex and Oechsle, an enthusiastic PCD customer that is still



surprising to me today. The company worked with polyamide synthetic materials and produced small gears with imprinted numbers for the production of vehicle odometers.

At that time, the grinding wheel production moved into a neighbour building, a large facility which happened to become vacant, and stayed there until 1984 when we moved to Donaustrasse in Hanau.

Rapid growth, combined with the demand for shorter delivery times, forced the company to find better conditions for grinding this "beastly material", as our former master diamond cutter Konrad Wagner dubbed it at that time.

After a search for a suitable machine, we finally found it at the Kelch Company, in the following years, this machine was further adjusted to the particularities of PCD grinding. After taking over the license and construction, LACH DIAMANT is still building this machine, referred to as pcd-100/300.

It was therefore perfectly prepared for the manufacturing of so-called "single-tipped" tools for the trade show in 1974.

**LACH DIAMANT Jakob Lach GmbH & Co. KG**

**Tel: 0049 6181 103822**

**Email: office@lach-diamant.de**

**www.lach-diamant.de**

**Hall 3 - Stand 3E23**

## Brave new INDEX world

At AMB 2018, the INDEX Group will not only be presenting new machines and innovative machining technologies. Visitors to the exhibition booth can also experience the new digital INDEX world. With various modules, iXworld helps to further improve efficiency in machining and to sustainably increase business success.

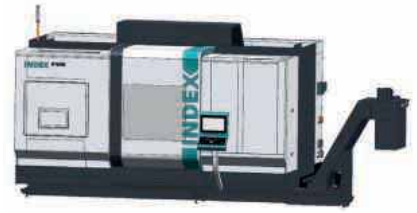
With the iXworld, INDEX will present first apps of a cloud-based platform at AMB 2018, which will profitably support the user in many areas. Through the iXplore, iXshop, iXservices or iX4.0 modules, the user can call up digital support for the entire process chain, from gathering information during the purchase of a machine through operating the machine to service and procurements of spare parts.

The simulation and programming software "Virtual Machine / VMPro" and TRAUB "WinFlexIPS" confirms that INDEX has been offering digital solutions for years. Based on the real machine geometry and software, but remote from ongoing production, new start-ups and workpiece machining can be virtually planned, tested

and even pre-optimised in real time, taking into account the automation provided in the working area, with one-hundred percent transferability into the real machine. The iXpanel operating concept, which has been offered for INDEX and TRAUB machines for some time, will also be presented in detail at the AMB trade fair. It provides special convenience and opens access to networked production.

Polygon turning, and high-speed whirling technologies are likely to develop into particular visitor magnets. They demonstrate their exceptional performance as well as the new ChipMaster chip breaking software.

However, the INDEX and TRAUB machines, seven of which will be on display at the trade fair booth, are and will remain the basis for the entire new INDEX world. The highlight will be the INDEX G420, a completely redesigned special category of a turn-mill centre, which is characterised by extraordinarily high inherent stability, a very favorable ratio of working area to external dimensions, and a user-friendly, ergonomic



design. The INDEX G420 alone is worth a visit, because live experience says more than a thousand words.

This also applies to the worldwide unique INDEX MS22-L, a CNC multi-spindle automatic lathe in a sliding headstock version, which can be used to efficiently produce slim components with high process reliability.

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**Tel: 023 9258 0371**  
**Email: sales@geokingsbury.com**  
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**Hall 4 - Stand 4B31**

## Flexible clamping technology

Workholding equipment for 5-axis machining, Industry 4.0 applications and automation will be presented on the Roemheld group stand at the AMB show.

On display for the first time will be the 'SPEEDY connect' double-acting, pneumatic, zero-point clamping system from Roemheld group member, Stark.

The units are compact, reliable and easy-to-automate, allowing their use in Industry 4.0 applications. Having a robust housing made of high quality tool steel and anodised, high-tensile aluminium, they can be used in harsh conditions.

The self-locking elements are clamped mechanically with springs, boosted pneumatically and also released pneumatically. Due to a 4.5 mm insertion stroke, a high insertion force of 3 kN at 5 bar or 8.5 kN at 20 bar and a retention force of 10 kN, the areas of application are varied and include robotic handling and gluing.

If components are to be held axially to save space, eccentric bore clamps from Roemheld are ideal. Their narrow design allows them to be placed close to workpiece

contours. Workholding is effected inside the bore, leaving the exterior free for machining.

Hydraulic workpiece supports from Roemheld are used wherever vibration or deflection of workpieces during machining must be avoided. A range of slim, threaded-body models is particularly versatile, being suitable for all installation positions and for use on low-pressure machines. Since the extension shaft can have a diameter of only 16 mm, difficult-to-access areas of a component can be reached. The new threaded-body supports are protected by wipers. The double-acting variant, which clamps and unclamps hydraulically, is particularly suitable for automated production.

For operation of hydraulic clamping elements, Roemheld will show intelligent power units of new, modular design at AMB. An integrated condition monitoring system shows in real time such parameters as the current operating pressure, the fluid level, the temperature and the degree of contamination. Data can be fed back to the



machine tool to support the manufacturing process. The system also helps to reduce downtime and assists planned maintenance.

From another member of the Roemheld Group, Hilma, a tower clamping system from the TS series will be presented. It is designed for manual, semi-automatic or fully automatic operation on horizontal machining centres. Four, eight or 16 components may be clamped at the same time. The systems are available with a third-hand function for safely mounting pairs of components and in versions for heavy workpieces.

**Roemheld UK Ltd**  
**Tel: 01462 459052**  
**Email: Terry@Roemheld.co.uk**  
**www.roemheld.co.uk**

**Hall 1 Stand 1H70**

# 50 years evolving a robot revolution

On a global scale it appears that the robot revolution has finally arrived. Seen as revolutionary over 50 years ago, robots were initially implemented primarily by volume producers with efficiency increases and safety being the main drivers. That revolution could now be said to be fully fledged; with global statistics highlighting issues such as aging populations, skill and labour shortages plus technology advances, robots are increasingly perceived as essential 'must have' tools for manufacturing.



Kawasaki MS Series robot a stainless-steel arm designed specifically for medical and pharma applications

Kawasaki Robotics joined the revolution at its beginning in 1968. An American scientist, Dr Joseph Engelberger, the founder of Unimation inc. and dubbed 'the Father of Robotics', was invited to speak in Japan to engineers and businessmen in that year. Hosted by Kawasaki Aircraft, Joe Engelberger's early experiences led him to believe no more than 10 people would turn up but in fact over 200 leaders of Japanese businesses attended with great interest. In a highly unionised 1960's America, robots were seen as a threat to the labour market while in Japan's booming economy they were of great interest to help overcome its severe shortage of labour.

As a result of this meeting, Kawasaki entered a technology agreement with Unimation to develop domestically produced industrial robots. Kawasaki shortly launched Japan's first hydraulic powered robot, the highly successful 'Kawasaki-Unimate 2000'. By the mid 70's

these robots were being used effectively by Nissan and Toyota for auto-body spot welding. The revolution had truly begun at this point and Kawasaki robots continue to be the preferred automotive spot-welding solution for many tier one and two automotive manufacturers globally.

Over the past 50 years, Kawasaki has developed the broadest range of robots available from a single manufacturer. From clean-room semiconductor wafer handling, Kawasaki has a 50 percent market share of this application, through to robots capable of precisely handling 1,500 kg loads, there is a wide spectrum of products. Kawasaki's understanding of robot requirements becomes clear when the extent of its own product diversity is explained.

Ian Hensman, Kawasaki's UK sales and marketing manager, explains: "Kawasaki is a large corporation with a very diverse engineered range of products including jet engines and turbines serving the aerospace and energy sectors, trains and carriages for the rail industry, shipbuilding and marine transportation systems. In addition, we also manufacture motorcycles admired and respected world-wide by enthusiasts and commuters alike.

"The diversity of production requirements, in our own businesses, provides us with a unique insight into the identification of robot tasks and analysis of procedures. We develop our robot range and apply our extensive experience of automation to our own facilities. This helps us to bring our customer's manufacturing to a more sophisticated level with solutions to improve the quality of their products. Without a doubt our ability to develop

technological solutions and invent new robotic applications is why prominent manufacturers choose Kawasaki as a preferred supplier."

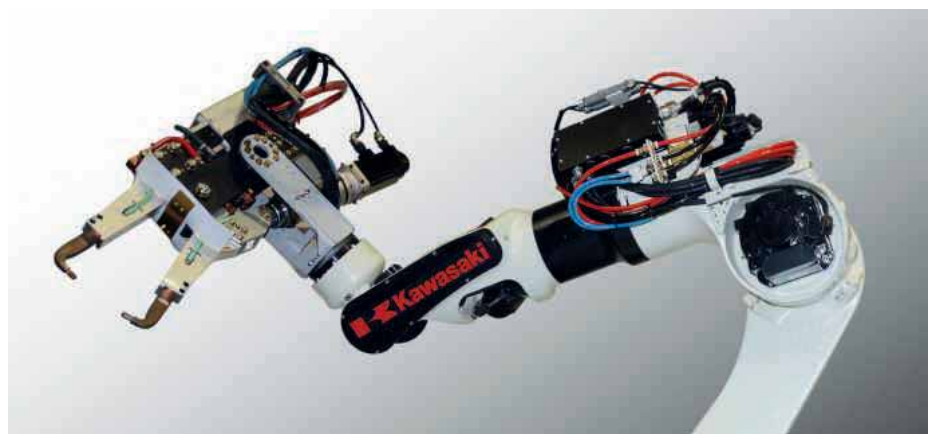
## The next 50 years

Yasuhiko Hashimoto, president of Kawasaki Heavy Industries Ltd, recently published the following 'future outlook' explaining his thoughts on the challenges for robotics over the next 50 years and the initial approaches and developments that have been made by Kawasaki.

For the last five decades, industrial robots have been a vital part of manufacturing in the auto, electric, and electronic parts sectors. With the development of digitised signal processing, and more sophisticated robotic mechanisms, they are now capable of performing more complicated tasks at a much faster speed, and their size has been reduced.

Today, the manufacturing of high-quality competitively priced products is not possible without robots. Manufacturing sectors in fast-growing China, and other parts of Asia, as well as in the U.S. and Europe, where much resistance to robotics applications was initially seen, are quickly adopting robots, showing that, worldwide, manufacturing without robots is no longer feasible.

Envisioning the next 50 years, future missions to be fulfilled by robots in industrialised nations are very clear: There is a need to accommodate labour shortages arising from aging workforces and to produce value-added products to support economic growth by leveraging passed-down expertise and skills.



BX Series spot welding robot illustrating 'through the arm/wrist' cabling routing



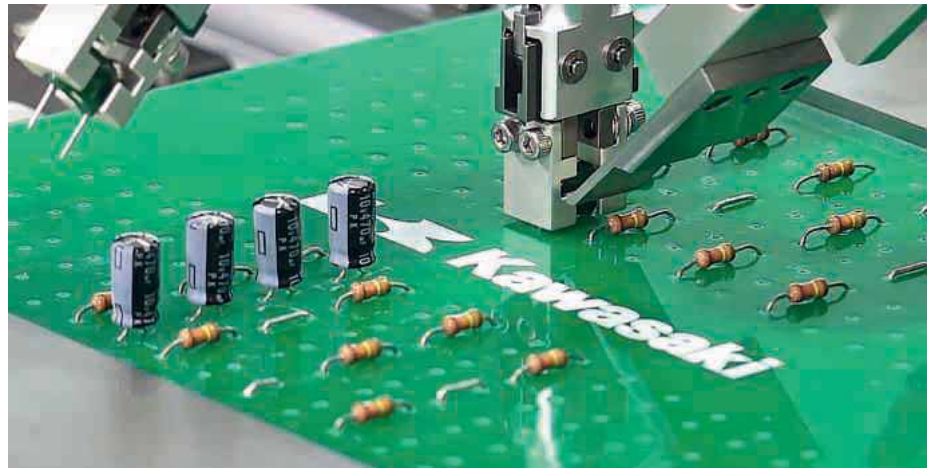
Challenges must be addressed that are associated not only with aging populations, but also with overall healthcare and welfare.

To achieve these imperatives, the functions and features expected of future robots will be very different than those of today. First, they must address shrinking workforces. Japan is the world's largest producer of robots, and until recently, it was also the largest user. However, according to statistics, only 300 units per 10,000 workers in the manufacturing industry were in operation, which came to a three percent utilisation rate, while in Korea, it was as high as six percent\*.

Since 2015, the Japanese workforce has been losing an average of 640,000 people annually, and this trend is expected to continue through 2060\*\*. If robots could take the place of half of the workers being lost each year, the Japanese industry could sustain itself.

To that end, we must seriously expand robotics applications. The duAro, a dual-arm SCARA robot, is a highly-versatile, compact robot which can perform a variety of tasks. It can work alongside humans, co-exist", as it is equipped with collision-detection safety features. Its low initial cost encourages manufacturers to adopt it for short-lived products. The duAro was Kawasaki's first countermeasure to the diminishing workforce.

The second invention to fulfill the robots' mission for the future is the Successor Series. This innovation was developed



Du-Aro Collaborative arm assembling flexible leads into PCB

based on remote collaboration technology and artificial intelligence to analyse the techniques of skilled technicians and teach those skills to robots and untrained personnel, thereby preserving and passing on specialised expertise to future generations.

The third focus is medical applications. Expectations for robotics applications in the medical sector are high. They can be applied to areas geared at reducing the risks of medical procedures, such as robot-assisted surgeries and surgical training, and can also be used for patient support, such as robotic beds which move patients automatically, preventing bedsores and other adverse conditions.

Robotics has evolved continuously, improving the efficiency of manufacturing,

and it will continue to do so, achieving greater coexistence and collaboration with humans. In such an age, Kawasaki is committed to driving forward new concepts focused on improving the coexistence and collaboration of robots with humans, as represented by the duAro, which works closely with us and can be easily adopted, as well as the Successor, which supports the continuity of superior expertise.

Fifty years since its inception, the industrial robot business has finally arrived on the threshold of a full-fledged robotics revolution.

\*Source: World Robotics 2017, International Federation of Robotics

\*\*Source: National Institute of Population and Social Security Research

Kawasaki Robotics (UK) Ltd is the UK robotics division of Kawasaki Heavy Industries Japan. Based in Warrington, Kawasaki Robotics (UK) Ltd occupies a 15,000 Sq. ft. building. Its location provides easy access to the main motorway network and is at the centre of its customer base.

The facility centralises all the sales and customer support operations, with areas for customer demonstrations, training, robot test and integration and a large area for stock machines. Over 1,800 machines are now operating in a wide range of industries and applications throughout the UK.

Operating through a network of system partners, automation integrators and also supplying direct to end users, Kawasaki Robotics (UK) Ltd offers experience in the widest range of industry sectors.

**Kawasaki Robotics UK Ltd**

**Tel: 01925 713000**

**Email: [info@kawasakirobotuk.com](mailto:info@kawasakirobotuk.com)**

**<https://robotics.kawasaki.com/en1/>**



Du-Aro Collaborative arm

# Tending towards improvement

## Why UK manufacturers need to move to robotic machine tending

Taking today's business environment into account, there are really five key reasons why a company should take the decision to switch to robotic machine tending.

Firstly, with the UK manufacturing sector facing a shortage of skilled workers, making sure that you are making the best use of the people you have is going to be increasingly important. Using robots should not automatically be about replacing people, but rather to handle the repetitive or arduous tasks that can help to free up people to work in other areas where their skills can be better utilised.

The next reason is competitiveness. When properly planned and implemented, automation can confer a major competitive advantage, enabling faster, more efficient and profitable production. With the UK lagging in the global league of robot adopters, there is a significant risk that failing to embrace the opportunities that robots can bring could see UK companies struggling to compete in the international market.

Connected to this is the ability of robots to help address uncertainty, an issue that is currently high on the agenda for many UK companies, especially with the outcome of the UK's exit from the EU still far from clear. To be as prepared as possible, it is important for businesses to ensure that their production processes are made as resilient as possible against unexpected changes. The ability of robots to be switched between different processes quickly and easily makes them ideal for handling fluctuations in demand or the need to use a single production line to handle multiple products, for example.

This flexibility can also be key to helping companies find new ways to become more profitable. As competition becomes more intensive and profit margins shrink, it is vital to find new ways to reduce the cost per manufactured part. Using robotic machine tending is one way to do this. Companies that do make the investment in robots can typically achieve a return on investment within a maximum of two to three years through quicker, smarter and more efficient production with less wastage.

It is important to remember that ROI should not be confined to potential



manpower savings, in many cases, introducing robots can be instrumental in helping to make workers more productive, but should also include improvements that can accrue in key areas such as wastage reduction, production throughput and health and safety.

Finally, contrary to popular opinion, today's robots are as well suited to handling low volume processes as they are for use in mass production.

A key benefit of robotic machine tending solutions is the ability to enable companies to get more both from their machines and their workers. Capable of operating around the clock and with little or no need for a manual worker to load up new parts between batches, robotic machine tending cells can offer a typical machine utilisation rate of 80-90 percent, compared with just 45-50 percent for a manual-based operation.

Worker utilisation can also be significantly improved, with operators able to be used for supervisory roles rather than for loading and unloading machines. As one person can typically supervise multiple machines in a robotic machine tending installation, the number of operators required per shift can also be reduced, enabling workers to be



deployed to handle other, higher-value tasks.

A combination of experience and advances in technology has seen the development of packaged robotic solutions incorporating all the equipment needed for a machine tending application. ABB's FlexLoader™ family of robotic machine tending cells, for example, combine a robot and robot controller, HMI, feed conveyor belts, buffers and visions systems into a range of pre-integrated packages, with different options available according to the scale and specific requirements of the operation. Simple to install and set up, these packaged cells can be up and running within just a few hours.

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## Breaking down the barriers to automation

There has never been a better time to invest in automation than with the introduction of the new Hanwha collaborative robots at Dugard. The HCR range of "cobots" proves safety is at a premium while installation costs are heavily reduced with units up to a third lower than regular industrial robots.

### Innovative sensor technology for anti-collision protection

Safety is a tremendously important factor for cobots as they can be fully integrated with your human team. With previous iterations of industrial robots, this has been impossible as they have required fencing and extensive guarding to prevent injury. Hanwha cobots, however, have successfully addressed this issue with collision detection at 25~150NM, equipping the cobots with innovative sensors that enable them to work safely beside their human teammates. They are built with joint rotation limit, joint speed limit, TCP speed limit and virtual safety fence to control the speed they operate at. This gives the user confidence in the cobots stability and safety.

### Cut investment and operating expenses

Automating the monotonous, repetitive details so your human team can concentrate on more challenging and, of course, more interesting tasks is so much more affordable with a cobot. At up to a third cheaper than installing an industrial robot, the Hanwha cobots make creating a new, blended workforce attainable.

### Highly adaptable with intuitive programming

The Hanwha HCR series of cobots are extremely precise with 0.01 mm positional accuracy and can be used anywhere, with any machine. The range starts small enough to fit into even the tightest production space and goes up to a heavy-duty model that can really hold its own in industry. They can be set up on the floor or mounted to a wall or ceiling and can be used in conjunction with any CNC machine tool, or even by themselves.

They are incredibly user friendly, programming can be as easy as hand guiding and progress can be monitored on



an app. This means that any member of your team can use and work with the Hanwha cobots without a lengthy training period, automating your production couldn't be simpler.

Dugard is showcasing the new cobot range at the Robotics and Automation event in October and at its Open House on the 17th & 18th October at its premises in Hove.

**C Dugard Ltd**  
**Tel: 01273 732286**  
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# Okuma provides insights into heavy-duty double column machining

In late June, Okuma Europe, represented in the UK by NCMT, welcomed international visitors to its technical centre east in Parndorf, Austria, to explore the large parts cutting and milling capabilities of its double column machining centres. Highlights of the dedicated workshop included live demos on an Okuma MCR-A5CII as well as an intriguing look ahead at the future of Okuma's double column giants. With more than 8,000 units sold and serviced around the globe, Okuma is a leading provider of double column machines for a wide range of industries, including aerospace, electronics and automotive.



### Live machining demos

Following an introduction to Okuma's impressive line-up of double column machines, attendees were treated to live machining demonstrations on the MCR-A5CII. The latest addition to the technical centre was shown to be the ideal choice when it comes to heavy cutting and dynamic machining. With a solid cast-iron construction, the machine provides high-speed multi-face machining in a compact footprint of only 6,830 x 12,550 mm. Live demonstrations included five-face general parts, and die and mould machining, as well as on-machine gauging and measuring.

### Auto attachment head compensation

Double column machining centres can be used for a wide range of applications by changing the spindle attachment head. However, this requires the operator to specify the swivel offset for each attachment, which is a very time-consuming process. Okuma's auto attachment head compensation was shown to dramatically



shorten setup times by automatically and quickly setting the required values. In this way, a process that would usually take several hours to complete only takes a few minutes regardless of the operator's skill level.

### Enhanced performance, lowered TCO

Increasing productivity by reducing downtime is one of many ways in which Okuma is able to significantly lower the total cost of ownership (TCO) of its machines. Visitors were introduced to Okuma's Intelligent Technology SERVONAVI. The application significantly increases throughput and surface quality by automatically adjusting servo parameters. A presentation on Okuma's Thermo-Friendly Concept highlighted its ability to stabilise thermal deformation and shorten warm-up times while reducing the need for dimensional correction during operation.

### Large parts laser metal deposition

Over the course of the event, Okuma invited guests to take a look ahead at the future of double column machining centres: The additive manufacturing capabilities provided by Okuma's LASER EX series will be available on double column machines. Customers will be able to apply technologies such as laser metal deposition (LMD), laser hardening and sectional repairs to large press dies and resin moulds.

Formed in 1964, NCMT operates from

three strategically located sites in the North, Midlands and South of England. It delivers high technology engineering solutions for metalcutting and grinding applications in the UK and across Europe, from stand-alone machines to complete production lines involving a high degree of automation. NCMT tends to specialise in the more demanding fields of engineering that are avoided by companies that just deliver a machine tool and little else.

The company prides itself on technical competence, innovative production solutions and reliable technology, based on some of the best machine tool platforms available anywhere the world. Its own agency ranges of toolsetting, tooling, workholding and shop floor diagnostic products often form part of the turnkey systems that it supplies.

Its business is all about satisfying customer demand, so responsive engineering support, training and back-up forms a core part of the NCMT service, from pre-sales through installation and commissioning and for the lifetime of the installation.

Okuma machines are available exclusively in the UK from NCMT Ltd.

**UK Agent:**

**NCMT Ltd**

**Tel: 020 8398 4277**

**Email: [daveburley@ncmt.co.uk](mailto:daveburley@ncmt.co.uk)**

**[www.ncmt.co.uk](http://www.ncmt.co.uk)**

## RK International signs agreement with integrated production specialist MCM

RK International Machine Tools has announced a new partnership, covering the UK and Ireland, with Italy-based MCM (Machining Centre Manufacturing), a specialist in the production of high accuracy 4- and 5-axis machining centres, which can also be combined to create flexible machining cells completely provided by MCM, with a strong focus on the aerospace sector. The partnership was officially unveiled at the Farnborough International Airshow in July.

Simon Rood, director and general manager of RK International Machine Tools, says: "The opportunity to work with MCM comes at an exciting time with strong growth in the aerospace sector within the UK and Ireland. MCM already has an incredible reputation across mainland Europe, and beyond, with installations in many of the leading aerospace OEMs and Tier 1 suppliers. Their ability to provide a full turnkey solution for a customer's requirements, customising the system to their specific needs, is also a major benefit in ensuring the right solution is delivered,

everytime. Farnborough will be the ideal launchpad for this new relationship between RK International and MCM, allowing us to bring to the attention of the aerospace community the potential gains that can be made in applying MCM's manufacturing technology."

MCM was founded in 1978 in Piacenza, Italy and has developed markets globally in the aerospace, automotive, industrial, energy, oil & gas and defence sectors. The machining centres it produces are highly rigid constructions that operate to accuracies of 4-5 micron with excellent dynamics to create performance-oriented technical solutions for customers. The machines range from the 800 mm cube of the Clock machines family to over 6,000 mm of the Jet Five machines family. Over 70 percent of the machines it manufactures end up in flexible manufacturing cells, with MCM being the single point of contact for customers throughout the manufacture and integration process.

Stefano Tirelli, sales manager for MCM, concludes: "We are very excited to enter



this new partnership with RK International Machine Tools, as we see good potential for our machines and systems within the UK, especially in the aerospace market. The expertise and experience with RK International will complement our skills and knowledge perfectly."

**RK International Machine Tools Ltd**  
**Tel: 01322 447611**  
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# Flexible manufacturing system for airfoil blade machining

In a world first, Starrag has designed, developed and fully integrated a Flexible Manufacturing System (FMS) for automated complete machining. This incorporates combined milling and turning on Starrag machining centres of Inconel and titanium airfoil variable guide vanes from forging to ready for assembly.

The system, scheduled to be commissioned later this year, is forecast to produce some extraordinary production benefits compared to the customer's existing machining routines.

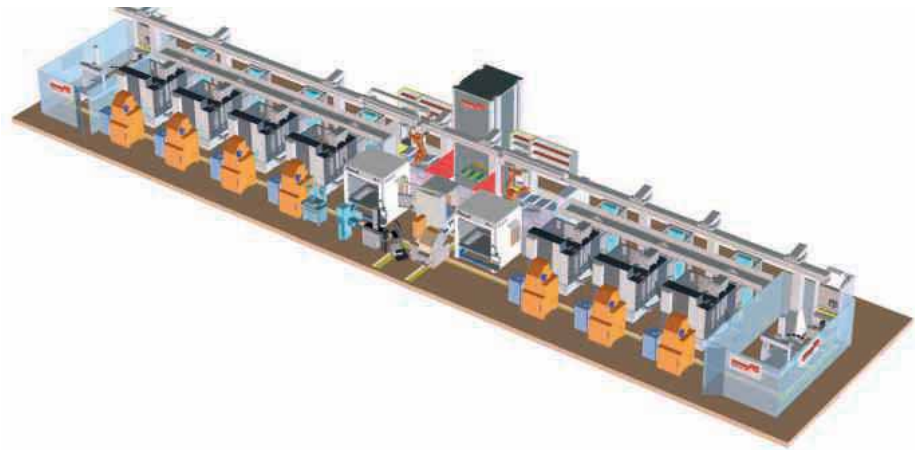
Developed over 18 months, the multi-million FMS comprises a mixture of best-in-class manufacturing technologies from various suppliers; machines brought together and integrated by Starrag.

The system is, however, based around seven Starrag LX 021 machining centres, which complete all blade turning and milling, as well as blade threading/parting off. The LX 021 has been specifically designed by Starrag for the highly-effective and efficient machining of blades.

Starrag's LX 021 is a 20 kW/22.5 Nm, 30,000 revs/min 5-axis vertical machining centre with a 4,000 revs/min turning capacity, axes A1 and A2. It has X-, Y- and Z-axis travels of 400 mm, 200 mm and 410 mm, respectively, plus 360 degree in the A-axis and -45/+95 degree in the swivel B-axis.

Importantly, any blade of any material type can be machined on any of the Starrag machines without operator involvement. This is achieved by establishing the same, single datum for every workpiece and using standardised fixturing, designed and built by Starrag.

The oversized 1 mm-3 mm forged blade blanks are held in storage cassettes, four before the overhead gantry robot picks up a



cassette and loads it into the system. The robot then selects grippers for handling the fixtures and for handling blanks/finished blades. The robot subsequently places a blank into the first fixture at the automatic setup station and the fixture is moved into one of the LX 021s where, initially, the blade's clamping faces, at the end of the shafts, are machined. Then follows an integrated sequence of washing of both workpiece and fixture before the blades are re-chucked for airfoil and shaft milling and turning.

The robot then moves the blades to the polishing and deburring cell where the airfoil and edges are polished, before fixturing and another clean prior to coordinate measurement using both tactile, touch probe, measuring and optical scanning. Finally, each blade is laser marked with a unique code.

The fixture and blade are then cleaned again before the blade undergoes thread cutting/cut-off of its clamping faces in an LX 021, to be followed by another clean before returning to the CMM for a second measuring sequence involving blade alignment and orientation.

After every individual feature has been measured/inspected on each blade, each finished blade is transported back to the automatic setup station and replaced into a cassette.

The only human involvement in the manufacturing process is the manual loading of the oversized forgings to cassettes that are taken into and removed from the cell via an access portal, plus all

tooling is pre-set offline and manually loaded to each of the LX 021's 90-station toolchangers. Tool change time is 1.2 secs and chip-to-chip time is 3.2 secs. All tooling, solid carbide, is Starrag-designed and manufactured.

Once in the cell, the entire movement of blades between the individual stations, including inspection, is achieved automatically via two gantry-mounted ABB 6-axis robots. The use of two robots not only minimises overall travel times along the 40 m long cell, but one robot could always take over all handling duties if one of the pair is out of action for whatever reason.

The system is designed so that there cannot be any single source of failure due to, for example, scheduled machine maintenance.

Apart from the seven LX 021 machines with a four-pallet buffer station, there are two Cellro washing machines, two Flexmill grinding/polishing machines with ABB 6-axis robots and two Hexagon-Leitz CMM's with three-pallet buffer.

A tower storage magazine holds workpieces, fixtures and robot grippers, as well as 1,500 blades to permit such extensive unmanned running times. In addition, there are two buffer stations for fixtures and two robot gripper stations.

**Starrag UK Ltd**  
**Tel: 0121 359 3637**  
**Email: lee.scott@starrag.com**  
**www.starrag.com**





# hyperMILL CAM strategies for aircraft construction

At the Farnborough International Airshow, OPEN MIND presented the hyperMILL® CAM solution for companies in the aviation and aerospace industry. The leading software for 5-axis machining pushes the limits of machining centres to meet the special industry requirements for complex parts and sophisticated materials. OPEN MIND provided information about milling, turning, and HSC, HPC, 2.5D, 3D, and 5-axis machining, as well as process chains involving PLM and simulations.

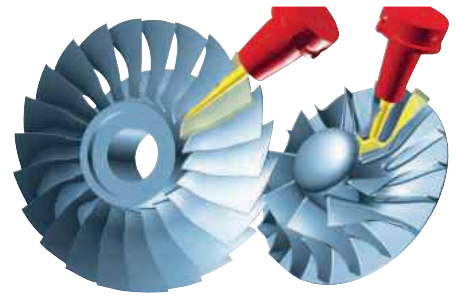
OPEN MIND showcased its proven solutions for the aviation industry with modules for easy, secure programming of impeller, blisk, and blade machining. hyperMILL also includes many interesting features for the challenges posed by other complex parts. These include a range of innovative 5-axis simultaneous strategies that enable efficient machining of challenging geometries such as free-form surfaces or deep cavities. For example, 5-axis helical drilling, a helical tilt milling method in which the milling tool is tilted in cutting mode, allows holes to be formed

easily and efficiently. A second tilt prevents collision with the hole wall. This is advantageous because only one tool is needed for different drill diameters, or open pockets of varying sizes. Pre-drilling is not necessary, and the strategy is very well suited for materials that are hard to cut.

### hyperMILL MAXX Machining

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

Illias Mustafa, director for global accounts, at OPEN MIND Technologies, says: "Aircraft manufacturers and their suppliers represent an industry that sets



high standards in terms of innovative materials, machining quality, and secure processes. At the Farnborough International Airshow we showed attendees how they can use innovative hyperMILL strategies to further increase their productivity and competitiveness."

**Open Mind Technologies**  
**Tel: 01869 290003**  
**Email: [adrian.smith@openmind-tech.com](mailto:adrian.smith@openmind-tech.com)**  
**[www.openmind-tech.com](http://www.openmind-tech.com)**

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NCMT Limited  
 Summer Road, Thames Ditton, Surrey KT7 0QJ  
 Tel 020 8398 4277 Fax 020 8398 3631



# Move into the fast lane in blisk machining

Blisk and bladed disk volumes in aircraft production are increasing massively. Large engines now have several of these high-pressure compressors that are manufactured from a single piece of high performance, often exotic alloy materials. The efficient machining of these materials is therefore becoming a focal point for project planning with a wide range of potential methods and combinations thereof available, from mechanical cutting to waterjet cutting. A recent study by the Fraunhofer Institute for Production Technology (IPT) and the Laboratory of Machine Tools and Production Engineering (WZL), at RWTH Aachen in Germany, has now shown that Precise Electro-Chemical Machining (PECM) from EMAG drastically cuts costs for users, particularly for dressing the component surface.

Components inside an aircraft engine are exposed to extreme stresses, high temperatures and long service lives. Developers, therefore, use very hard, heat-resistant materials such as nickel-based super alloys for the construction of blisks and disks with single blades. This development presents a range of problems to manufacturing engineers, since conventional cutting methods become uneconomical as the material hardness increases and the service life of expensive tools drops, therefore causing unit costs to rise. A recent study by the specialists at Fraunhofer IPT, together with WZL and EMAG ECM GmbH, compared a total of seven different blisk machining strategies, from multi-axis milling, combined with polishing to high pressure water jet cutting combined with PECM dressing.

The results are impressive. For an assumed production volume of 800 nickel-based HPC blisks, the unit costs can

be reduced by more than 50 percent compared to mechanical cutting if users adopt the correct machining strategy. PECM dressing proves to be the essential final process to make radical improvements to the efficiency of the production process.

In view of this, the PECM technology supplied by EMAG ECM, based in Germany, is currently being studied very closely by many OEMs and their suppliers. The electro-chemical process removes material without contact and causes minimal tool wear while being fast and reliable. The basic principle is simple to explain.

During the process, the workpiece becomes the positive anode and the tool the negative cathode. An electrolyte solution flows between them, removing metal ions from the workpiece. The form of the cathode (tool), with its active, conductive zones, results in material removal from the workpiece at the required component contours. Ring ducts, grooves, bell hollows and other contours can be produced without contact, but with very high precision and excellent surface quality. With its PECM technology, the experts from EMAG ECM have developed this process in a targeted manner and tuned it to perfection.

EMAG ECM has two machine types for the different machining tasks of engine production. The small model PO 100 SF is designed for machining single turbine blades, the larger PO 900 BF is for machining the complete, and therefore much larger, blisk. The systems differ in machining area size, footprints, generator capacity and the number of machining axes with precise PECM technology and EMAG high performance components available in both.

The PO 100 SF development was the second stage in 2013 when an ever-increasing number of customers demanded an electro-chemical machine solution for single blades. Both these machines also provide the user with central EMAG innovations such as a Mineralit® polymer concrete machine base, intelligent software and hardware interfaces and efficient automation solutions.



This method has already been implemented into actual production with top results. For example, a well-known engine manufacturer has already certified single blades made on the PO 100 SF, for use in aircraft in 2014, unusually quickly after the start of production of the machine at a supplier's plant. A similar stage is currently pending for blisk production.

The geometric machining precision is one of the main factors behind the technology's success. In addition, it produces high surface quality with low peak-to-valley heights. Subsequent finishing processes on the blades, such as slide grinding, are therefore no longer required or can be completed much quicker which results in a further reduction in unit costs. This is a massive plus point for a component which is becoming ever more important and whose volumes are rising massively.

**EMAG (UK) Ltd**  
**Tel: 01902 376090**  
**Email: info@uk.emag.com**  
**www.emag.com**



## UK manufacturing facility approved by Bombardier

With more than 70 approvals from leading North American and European aerospace OEMs to its name, Master Fluid Solutions is already world-renowned for providing the industry with solutions for its demanding high-tech alloy cutting and grinding needs. The company is therefore delighted to add another approval to its tally.

Master Fluid Solutions' production facilities in the United Kingdom have now been approved by Bombardier Aerospace to supply authorised metalworking fluids. The site will not only serve Bombardier, and its subcontractors in the UK and Ireland, but on mainland Europe too. This development is in addition to previous approvals received for Master Fluid Solutions' factories in Perrysburg USA, China and India.

Clearly this move gives Bombardier's supply chain even more flexibility and availability of approved Master Fluid Solutions' products in their local markets, throughout Europe and indeed globally.

One of the most significant Master Fluid Solutions' products to be covered by this new approval is MicroSol® 590XT that was specifically developed for aero-structures

and aero-engine applications. This is a coolant which not only meets the demands of Bombardier and other aerospace manufacturers in terms of performance but is also fully compliant with the most up to date European regulations.

### Boeing approves TRIM MicroSol 590XT for aerospace manufacturing

Sealants, paints, heat-treated steels, dissimilar metal stackups, exterior aluminum surfaces, titanium, and titanium alloys are commonly used in the aerospace industry, including Boeing and its subcontractors. These approvals allow Boeing, and its subcontractors, to use MicroSol 590XT to machine these high-tech aerospace alloys to make parts for all space and aircraft including the 737, 767, 777 and 787 families of airplanes.

Monte Dhatt, director of global aerospace strategic business unit at Master Fluid Solutions, says: "MicroSol 590XT not only meets the demands of specific aerospace customers, but it is also environmentally and regulatory compliant for the foreseeable future. The expanding



Image supplied courtesy of BOMBARDIER Aerospace

Boeing area approvals allows Boeing, and its subcontractors, to utilise MicroSol 590XT in many more manufacturing operations."

MicroSol 590XT improves on the validated performance of previous generations with a robust stability package using environmentally safe ingredients. The formula is a favourite of production managers, environmental advocates, and safety professionals. MicroSol 590XT is free of chlorine, triazine, formaldehyde releasers, phenols, boron, DCHA, and secondary amines. It dramatically extends useful life without the need for tank-side biocides or fungicides.

### Master Fluid Solutions

Tel: 01449 726800

Email: [info@masterchemicals.co.uk](mailto:info@masterchemicals.co.uk)

[www.masterfluidsolutions.com](http://www.masterfluidsolutions.com)

## Fives' new Cincinnati HMC 800

The new Cincinnati HMC 800 is a high-performance HMC solution for demanding aerospace, oil & gas, and other industrial hard metal manufacturing applications that require precision machining.

The Cincinnati HMC 800 combines high spindle torque and power with superior dynamic machine stiffness, plus, the dual ball screws provide exceptional feed rates: 45 m/min, and acc/dec rates of 0.5 G. The bridge and saddle, designed with enhanced dynamic stiffness, provide optimum finish and tool life in hard metal applications.

Brent Keller, engineering director at Fives Cincinnati, says: "The Cincinnati HMC 800 is the perfect solution for the aero or industrial customer who machines hard metal applications, from steel to titanium. The unified structural design allows for fast installation on existing shop foundations." the Cincinnati HMC 800, we are targeting those applications where accuracy, rigidity and reliability are priorities."

The Cincinnati HMC 800 is capable of 5-axis, 5-sided complex part manufacturing.

The 5-axis combines twin ball screw driven axes in XYZ, an infinite contouring B-axis table, and compact u-frame A-axis tilt spindle for full 5-axis contour machining of complex part geometries. All combined, the HMC 800 delivers 5-sided machining capability with balanced speed, accuracy and range for complex part manufacturing, with reduced part setups for better quality and lowest cost-per-part.

Brent Keller says: "We designed the Cincinnati HMC 800 with the customer in mind; reliable, hard metal machining, low parasitic time, all at an affordable price."

Additionally, it is equipped with high-torque spindle options for hard metal processing, 2 speed, 6,000 rpm, and all spindles have external flood up to 250 psi and internal thru-spindle coolant up to 1,500 psi (HSK100A/KM4X). Tooling options include: HSK-100A, KM4X100, Big plus 50.

As an industrial engineering group, Fives designs and supplies machines, process equipment and production lines for the world's largest industrials including the aluminium, steel, glass, automotive,



aerospace, logistics, cement and minerals, energy and sugar sectors. Located in over 30 countries, and with nearly 8,700 employees, Fives is known for its technological expertise and competence in executing international projects.

Fives' multi-sector expertise gives it a global vision of the industry which provides a continuous source of innovation. The effectiveness of its R&D programs enables Fives to design forward-thinking industrial solutions that anticipate clients' needs in terms of profitability, performance, safety and compliance with environmental standards.

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Tel: 001 234 217 9070

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# Goodman banks on Hartford machining centres for ultra reliability

The success of a pair of Hartford vertical machining centres (VMCs) at Goodman Metal Works has prompted the family-owned company to order a third machine from T W Ward CNC Machinery (Ward CNC), Hartford's exclusive UK and Ireland agent.

All three new machining centres are being used as replacements for ageing VMCs at the Nottingham-based firm and, while they are faster and consistently more accurate than the units they replace, it is the "unfaltering reliability" of the first two that has prompted managing director Richard Goodman to invest in another model from the Hartford range.

Richard Goodman says: "The Hartfords are well-built, sturdy machines that work day in, day out achieving consistent standards of machining. It is these characteristics, knowing that when we switch them on they will always work and work well, that were the prime considerations when we chose them.

"The bulk of our machining is straightforward milling, boring and drilling, but I need ultra-reliable and highly rigid machines because I cannot afford to let customer delivery schedules go awry. In fact, the first two Hartfords helped us gain two new customers due to the fact that we were able to keep our delivery promises."

Richard Goodman explains that the initial tranche of investments, firstly in a Hartford PBM-115A CNC horizontal borer, then three months later, the large capacity Infinity HSA-420 double-column VMC, was made on the realisation that the savings made on the maintenance costs, and downtimes, with his existing, older VMCs would simply pay for the new machines.

Richard Goodman says: "I contacted a number of likely suppliers, but I chose Ward CNC for a number of reasons. Ward CNC had plenty of machines in stock, so we could immediately see what we could be buying. However, the Hartfords stood out on a variety of counts. Not only could I see and 'feel' the quality of machine build that is based on a one-piece heavy-duty cast iron bed for superb accuracy and rigidity but, importantly, these machines also offered exceptional machining performance with first-class back up and training from Ward CNC.



"This is ideal for the workpieces we process; a machine handling fabrications, weighing up to seven tonnes every day (and night), can put a lot of stress on a moving table and I wanted machines that would guarantee to be operational all the time."

The two Hartfords in situ in the 45,000 ft<sup>2</sup> production area have all the capacity and power that Richard Goodman needs for the targeted work; the PBM-115A has a geared high power 3,000 revs/min spindle and X, Y and Z axes travels of 2,000 mm by 1,600 mm by 1,500 mm, the Infinity HSA-420 is rated at 6,000 revs/min and has X, Y and Z capacities of 4,000 mm by 2,000 mm by 1,000 mm.

With 91 employees including apprentices, Goodman Metal Works specialises in the fabrication and machining of a wide range of workpieces for a variety of industries, including work for customers in the oil and gas, nuclear, quarrying and mining sectors as well as, for example, Rolls-Royce.

The company added CNC machining to its portfolio of services some years ago in response to customer demand and it purchased a VMC (then others) for the occasional fabrications that also needed basic milling, boring and drilling routines. Today, the added-value machining of fabrications accounts for around 15 percent of business and high-quality CNC machining is also a service offered in its own right.

It was in 2010, however, that maintenance of four old VMCs being used for such tasks was effectively becoming the company's third highest overhead and Richard Goodman realised that if those costs could be reduced then the savings would easily pay for the finance on the new machines.

Richard Goodman concludes: "So, as long as the Hartfords weren't slower than the machines they replaced and, of course, they weren't, I knew the company would benefit, particularly in terms of minimal downtimes. In addition, customers also benefited because they knew delivery schedules wouldn't be hindered by machine breakdowns.

**T W Ward CNC Machinery Ltd Tel: 0114 276 5411**  
**Email: [sales@wardcnc.com](mailto:sales@wardcnc.com) [www.wardcnc.com](http://www.wardcnc.com)**

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# Keeping railway heritage rolling along

Built in 1903, the Welshpool and Llanfair Light Railway served the communities along the winding valley that joined the mainline at Welshpool. This narrow-gauge railway allowed livestock, coal and timber to be transported easily, as well as providing a passenger service until the early 1930's. The line operated until 1956 when British Rail deemed it uneconomic. A regular steam hauled public service once again returned to the line in 1963 when a group of enthusiasts took on the challenge of making it into a successful tourist attraction. Key to that success was the retention of two of the original locomotives and the acquisition of rolling stock from railways both in the UK and Europe. Now almost 120 years old, this historic collection requires regular maintenance and care, which is where the railway's engineering workshop comes in to its own.

A little bit of catching up was required as the first maintenance workshop wasn't built until 1968 and the locomotives lived outside in the elements until 2000. An extension to the workshop, in the 1980s, saw the development of the machine shop, with machine tools being 'begged, borrowed or stolen' from supporters of the railway. Things did improve in the 1990's when a Heritage Lottery grant allowed some additional machines to be purchased, but when mechanical engineering manager, Richard Featherstone joined the railway in 2016 he recognised an adequate, but not ideal situation:

"We had a lot of manual machines and work on them was time consuming and,



given that we rely on some skilled volunteer labour, time is at a premium. What we needed was bigger and faster milling and turning capacity that also had to be user-friendly to cater for the skills and work that we have. An appeal for funds went out and, as a result, we were able to order two XYZ machine tools, an SMX 4000 bed and an SLX 425 ProTURN lathe."

These machines made an immediate impact on the way that Richard Featherstone was able to support the maintenance of the engines. One example was spark arrester plates for the smokeboxes, which are made up of a sandwich of stainless steel plates and mesh held in place by 28 M6 screws.

Richard Featherstone continues: "These M6 drilled and tapped holes would traditionally have been marked out, centre popped and manually drilled, then adjusted by the fitters for assembly. We now machine

them on the SMX 4000 and every hole is in the right place and the comments from the volunteer fitters are typically 'it fits'. The time savings are significant."

Similarly, the SLX 425 ProTURN lathe is generating major benefits for Richard Featherstone and his team of volunteers. Each of the couplings between engines and rolling stock has an adjusting nut which has a 11/4 4TPI round thread form. A batch of 15 off has been manufactured by a semi-skilled volunteer in an afternoon on the SLX 425. Prior to this using manual machines this was a week's work. For traceability these parts are then put on the SMX 4000 and etched with the relevant details, again, this would have been done by hand with letter and number punches previously.

Programming is done at the machine by Richard Featherstone at present. He is then happy to hand over the operating of the machines to semi-skilled volunteers, although this situation should improve when he recruits an additional full-time machinist. One feature that Richard is particularly enthusiastic about on the SLX Lathe is the TRAKing facility, which allows him to use the handles to move through the program, while remaining in full control "I love the TRAKing feature as you know you can back off if you have any uncertainty about the tool path. That said, the ProtoTRAK control is so easy to use, with step-by-step instructions it is so easy to get things right first time."

**XYZ Machine Tools**

**Tel: 01823 674200**

**Email: [nigel.atherton@xyzmachinetools.com](mailto:nigel.atherton@xyzmachinetools.com)**

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# Quality and versatility with Haas machines

From its origins more than 40 years ago as a backyard business, Jim Stokes Workshops Ltd (JSW Group) has grown steadily over the years and now easily fills five spacious units on an industrial estate in Waterlooville, Hampshire.

The company employs a team of 65, many of whom are specialist technicians, in one of the most rarefied sectors of automotive engineering.

When he started the business, Jim Stokes was probably regarded as a little bit of an eccentric. This was in the years before classic cars had become collectibles for billionaires, and "safe" repositories for global capital, much like Old Masters have become, since.

Jim Stokes's almost singular obsession at the time was the Alfa Romeo 8C, which the Milan-based company built from 1931 to 1939.

The straight-eight engine and its chassis were configured in various guises for road and track over the years, by the likes of Enzo Ferrari's fledgling Scuderia, as well as the works Alfa team.

What no one really knew when young Jim Stokes first began his fettling and restoration activities, was that the 8C's scarcity and illustrious history would eventually make it one of the most sought-after vintage cars in the world.

In the intervening years, JSW Group has built a reputation around the world for 8C expertise, as well as in-depth knowledge for similarly rare and exotic Aston Martins, Ferraris, Jaguars, Lancias, Mercedes, and Rolls-Royces, which pass through for repairs, pre- and post-race TLC and, occasionally, full restorations.

The rate of expansion has been very impressive for a small, family-run business, with employee numbers tripling in the last 10 years.

Chris Green, marketing and design manager, says: "We have apprentices in every division. It's difficult to find the right kind of people so we grow our own. You need to be a natural when you are hand-creating car body parts; we have two former apprentices who have been able to do just that and, of course, they want to stay on with us; why wouldn't you?"

The "V8s", as Jim Stokes calls them, allow Triple M to produce one-offs or batches of better-than-new components, such as cylinder heads, cylinder blocks, valves,



crankcases, carburettors, oil and water pumps, and plenty more besides.

Jim Stokes says: "I like the American engineering and I like the way Haas machines work. They've proven themselves as hard working, reliable machines, and they've allowed us to bring so much more of our part manufacturing back in-house."

On any particular weekday, the JSW Group garage may contain several Alfa 8Cs, usually owned by media-shy big-name collectors or well-known, very successful business people. A frequent visitor to the shop is the 1932 Le Mans 24-hour race winner.

The Haas machines also produce parts for the group's Classics by JSW division. This is where the company restores, repairs, and rebuilds more "affordable" classic cars, including Porsche 911s, MGs, and even humble Morris Minors.

The Haas machines are used to make components that are simply no longer available. By machining in-house, Jim Stokes can control the quality of the parts; he can also subtly improve the original designs where appropriate.

Jim Stokes is unequivocal and outspoken about the usefulness and versatility of Haas

machine tools. "I can take a job, put it on any of the Haas machines, and get the same result in terms of quality and repeatability."

JSW now has five CNC machines, all of which are Haas. Chris Green concludes: "They're all permanently occupied. From the first machine we had in 1995 to our latest, nothing stands idle. Our latest investment is a VF-2TR 5-axis vertical machining centre. The minute it was plugged in it was running and it's been running ever since, earning money. It's exactly what we needed. The 5-axis has been put to some varied use.

"It's currently making cross-shaft seal housings for a pre-war 6C Alpha. These would have taken an hour to machine but with the 5-axis it's completed in six minutes, and it's very highly polished. Next, we'll be making oil pumps, it's very intricate, very fast work."

**Haas Automation Ltd**  
**Tel: 01603 760539**  
**Email: [cnc@haas.co.uk](mailto:cnc@haas.co.uk)**  
**[www.haas.co.uk](http://www.haas.co.uk)**

## Substantial investment at Dawson Precision Components

DAWSON Precision Components (DPC) has installed advanced new machines at its Greater Manchester engineering base, including one machine that is the first of its type in the UK.

DPC provides wide-ranging subcontract and engineering services to clients in the UK, Europe and beyond, across sectors including aerospace, aviation, defence, energy, environmental, marine, medical, motorsport and rail transport.

The new equipment, costing £230,000, represents the latest stage of its investment. Over £1 million has been invested in expanding DPC's workshops and premises in recent years by owners Simon Dawson, Paul Dawson and Julie Hughes.

The new machines installed at DPC's base in Shaw, Oldham, are a Miyano BNA 42 GTY with Low Frequency Vibration (LFV) and a Citizen L20 Type 8, also with LFV, which enables better swarf management in metal or plastics.

The Citizen is a 20 mm capacity sliding head with sub-spindle live tooling and magazine bar feed. It is particularly suited to

long, slender jobs and parts that require turning and milling in one operation.

The Miyano is 42 mm capacity and similar configuration to the Citizen. It is the first of its type to be installed in the UK with LFV Technology.

Paul Dawson says: "Citizen and Miyano hold an Open Day event every year and we recently went to Watford to see the new Miyano BNA 42 GTY. We'd heard about the machine in the pipeline but wanted to see it running. It has a 42 mm diameter capacity and has replaced two older machines we had. The new machine complements our other machining capabilities of 32 mm and 50 mm diameters.

"Staff at DPC have been trained on operating the new equipment, with in-house training and visits from trainers at Citizen.

"We have invested significantly, recently, in the latest machining equipment, new production control software, inspection facilities and skills to boost our already enviable reputation."



In other developments, DPC has received a strong number of enquiries linked to the recent Subcon 18 supply chain show at Birmingham's NEC. DPC took a newly-designed exhibition stand to the NEC, reflecting its brand-new website, and met lots of good contacts, both new and existing.

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# Citizen's non-guidebush Cincom L20 slashes lead time

The ability to change its recently installed Citizen Cincom A20-VII sliding head turn-mill centre into a non-guidebush variant for applications on plastic components, and shorter length parts, whilst retaining the guidebush assembly for longer parts, has enabled Colpa Precision Engineering to slash weeks from its lead time with significantly reduced material costs plus the ability to obtain greater number of parts from a bar.

Martin Branch, general manager of Colpa Precision Engineering, says: "The removable guide bush feature on the Cincom A20 has increased our competitiveness in a tight market as we no longer have to order pre-ground bar for plastics components, which has not only reduced material cost but also saved four weeks on our lead time to customers and has enabled us to pick-up new business."

He also confirmed that by replacing an aging Citizen Cincom C16 with the new A20, Colpa is slightly reducing cycle times, but more important to customers, improving productivity, consistency, uptime and machining accuracy, which is again helping to lower delivery lead times.

Colpa Precision Engineering was set up in 1946 and has had the current directors / proprietors Dave Fry and Steve Low running the firm for the last 25 years. Investment has been consistent with some £560,000 spent



over the last three years and, in addition to machining centres and fixed head lathes, some six Citizen sliding head machines are installed.

On the Watford site, 10 people are employed, and production batches vary between prototype and customer development parts to continuous production runs such as involving the supply of 32,000 parts a month. The recent Cincom A20-VII installation is now mainly used for plastic parts and some aluminium.

Martin Branch says: "We run our first production batch with the guidebush installed and then removed it in less than 45 minutes. So far we have never used it again due to the advantages we have gained without it on smaller parts."

He also added that a Cincom A32-VII, installed two years ago, has now been dedicated to mild steel and stainless-steel part production which uses a permanent guidebush.

Colpa's customer base covers a wide field including: optical, electronic, audio, music, pneumatics, commercial air conditioning and certain aircraft industry companies producing parts from brass, mild and stainless steel, aluminium, titanium and a wide range of plastics including PEEK and

acetal. Cycle times tend to generally vary between 45 secs and two minutes.

Martin Branch describes two typical parts produced on the new A20-VII, one a micro cable clamp produced in 1,000 batches in white acetal to  $\pm 0.05$  tolerances and a black acetal intricate, multi-featured anti-skate dial which is machined in cycle times of under two minutes in batch quantities of 500.

The cable clamp is 9.5 mm in diameter by 6 mm long and is turned on the outside diameter, spot drilled, drilled and tapped followed by use of a slitting saw to cut a slot along the length of the OD into the drilled hole. It is then picked-up by the sub-spindle, which has a pre-set tension so as not to collapse the part, to produce a cross hole dimple, the bore chamfered and the part deburred in cycle.

Meanwhile, the anti-skate dial has a cycle time of under two minutes and was transferred to the new machine from the existing A32 in order to free up its capacity for larger work and maximise the use of unground bar.

The component is 14 mm diameter by 14.75 mm long with key features that include the head of the part with 12 milled slots each having 1 mm radius at the bottom

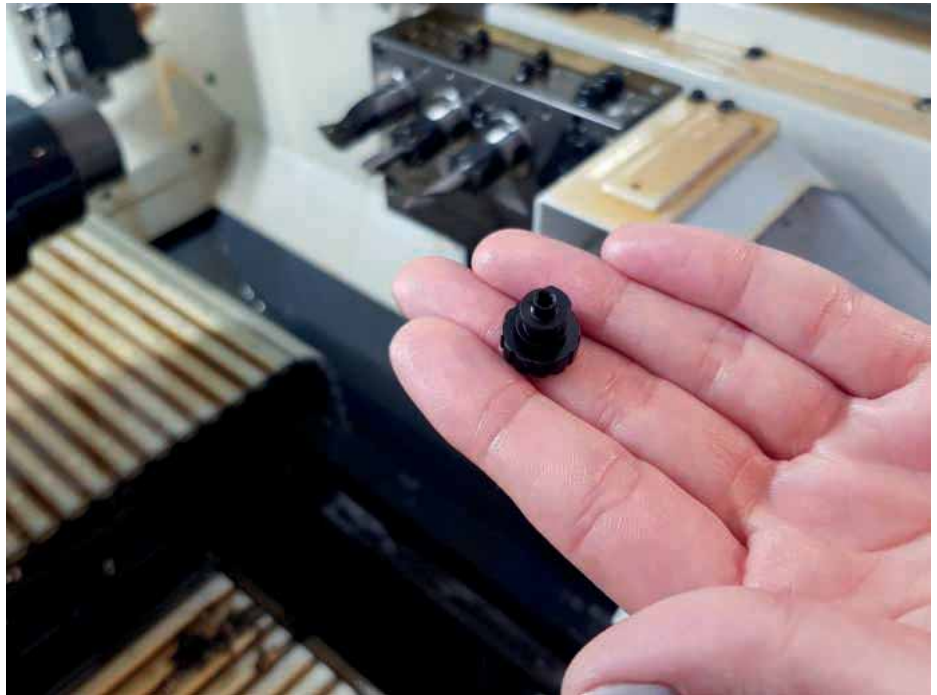


of the slot set on a 15 mm tool PCD. A spigot diameter has a waist, the head undercut with a cross hole 1 mm diameter which breaks into the 2 mm through bore.

The other end of the part has a cam form just 1 mm thick, produced with a 4 mm radius, and a 5.22 mm width cam lobe extended out to 4.75 mm and having blending radii of 1.5 mm. The part is also drilled and tapped M3 by 6.5 mm deep and the head counterbored to a series of 8.5, 10.5 and 12.5 mm diameters by 3.75, 3.0 and 1.75 mm respective depths.

The 5-axis Cincom A20-VII has a bar capacity extendable to 25 mm with 10,000 revs/min main spindle from a 3.7 kW drive. The 1.5 kW sub-spindle has a maximum speed of 8,000 revs/min whilst tool capacity is 21 tools with driven tools having a maximum speed of 6,000 revs/min from a 0.75 kW motor for cross machining. Positioning speed is fast at 32 m/min with a direct indexing C-axis enabling deceleration direct to the programmed position.

Martin Branch concludes: "The installation of the Cincom M32 two years ago, plus the new A20, has enabled us to take on more complex and profitable work. This has come from both existing and new customers and



proves that continued investment cements the future of the company. It also gives us the confidence to continue with improving, not only our production capability, but also support areas such as inspection and measurement."

**Citizen Machinery UK Ltd**  
**Tel: 01923 691500**  
**Email: sales@citizenmachinery.co.uk**  
**www.citizenmachinery.co.uk**

## Machinery investment helps Peter Day capitalise on 20 percent sales boost

A Christchurch-based subcontract machinist has invested in the latest CNC technology to help it meet a 20 percent growth in orders. Peter Day Precision Engineers, which is part of the Venture Precision Engineering Group (VPEG), has installed a Nakamura WY150 from the Engineering Technology Group (ETG) into its 14,000 sq ft facility on Airfield Road.

The twin-spindle, twin turret configuration gives the company the ability to remove a lot of secondary operations making the overall 'turning' process quicker for customers.

Pete Makosa, general manager for Peter Day Precision & Hightown Engineering, says: "Our work is very much around manufacturing complex machined components that have to perform in demanding environments. Whether that is for aerospace, oil & gas or the medical sector."

"Over the last twelve months we have seen a 20 percent increase in orders, which will see the wider VPEG group break through £10 m turnover this year. This,

combined with a strong pipeline of future orders, means we need additional CNC turning capabilities so asked long-term supplier Engineering Technology Group to come up with a solution.

"We go back more than eight years and have always been impressed with ETG's ability to understand our situation, what we want the machine to do and then deliver a range of different options.

"Our first Nakamura, a super NTJ, was installed in 2010 so we know how reliable they are and the fact they offer fast metal removal rates while still holding tight limits. The WY150 is a very impressive machine and has the added benefits of being twin spindle and twin turret. That was a very big plus for us."

Peter Day, which supplies components for blue chip customers including Curtiss Wright, Planer, Armfield and Eaton, installed the new Nakamura in June and it is already having the desired impact of freeing up capacity and meeting increased volumes generated by the clutch of contract wins.

Technical experts from ETG took just five



days to install and configure the WY150, with two staff now fully trained and getting the most out of the new technology.

Peter Day Precision Engineers, which is over 30 years old, is planning to expand its manufacturing facility even further to help it accommodate a further 20 percent increase in sales.

**Engineering Technology Group**  
**Tel: 01926 298128**  
**Email: mdoyle@engtechgroup.com**  
**www.engtechgroup.com**



# YMT products deliver efficiencies

Since YMT's inception in 1981, the company's profound understanding of machining applications has allowed it to source an unmatched range of cost-effective equipment that enables machine tools to realise their full productive potential. Rather than being an added cost, the efficiencies made possible by YMT's tooling division provides users with rapid ROI's and improved profits. A perfect example of YMT's range is the popular OMG products.

With over 50 years of experience within the global machine tool business, OMG has developed unmatched levels of expertise in the design and manufacture of high-quality tapping spindles, multi spindle heads and spindle speed increasers. The company boasts a comprehensive series of robust, high quality Angle Heads that cover a wide range of application.

The comprehensive OMG TA range is now regarded as the ultimate heavy-duty Angle Head series by users throughout the world.

Whether a requirement is for higher spindle speeds, or to machine components at various angles, OMG's high-quality TA spindles are able to increase machining capabilities and to boost efficiencies. The use of OMG's TA Angle Heads allows users to release the full latent potential of their machine tools, to broaden the scope of the work they undertake and to enter new markets.

Recognising the need for high levels of adaptability, complementing its application specific range of TA Angle Heads, OMG has developed an advanced modular TA Angle Head system that allows users to achieve cost reductions and to increase profits. Also, on the rare occasion that a product from OMG's standard TA Angle Head range will not meet a customer's specific

requirements, the company is able to design and manufacture special Angle Heads to satisfy the most challenging of applications.

All OMG TA Angle Heads are supplied with an internal channel coolant system. OMG TA Angle Heads' standard torque arms allows the head to be changed automatically. The coupling system between the conical pin, which can be axially adjusted, and the "V"-housing of the stop-block, allows the closing of the space between the parts. This results in a rigid, backlash free system that delivers maintenance savings, in addition to extending both tool life and bearings life.

Also available, for maximum stability, is the OMG TriBlock and QuadBlock torque arm systems, each with an adjustable pin, allowing both radial and axial thrusts to be effectively opposed and providing the possibility of milling or finishing with total security.

All standard OMG TA Angle Heads are made from solid steel resulting in maximum strength, minimum possible size, ideal for thin wall milling, and less weight. Each body is niproly treated and anti-corrosion coated, giving the guarantee of high levels of protection against rust as well as acid and aggressive lubricant-coolants. Each TA Angle Head contains precision bearings, or when models are intended for high stock removal conditions, tapered roller bearings. Lubrication is provided by long-life grease.

The OMG "MO" series of spindle speeders has been designed and developed to provide a high-quality product that ensures maximum reliability and precision in milling, drilling and engraving applications. OMG's technically superior spindle speeders are a result of decades of accumulated know-how and intense R&D. The MO series delivers a maximum speed 35.000 rpm, while the range allows the machine tool to rotate at low rpm and also



provides the possibility of using hard metal tools. The series' compact design, robust construction, heat-treated steel parts, and the use of involute ground gears, guarantees the transmission of high power ratings with amazingly low noise levels.

Available with manual or automatic tool change options, and with coolant through the tool centre as standard or on request, the MO series spindles are supported by a set of preloaded precision ball bearings with oblique contacts that ensure greater strength and rotation precision of less than 0.01 mm.

The new generation of TA.CP angle heads represents an innovative range that is ideal for use on smaller machine tools. Although the reduced weight and size of the TA.CP angle heads applies less of a load to tool changers, the innovative, strong product delivers high levels of performance.

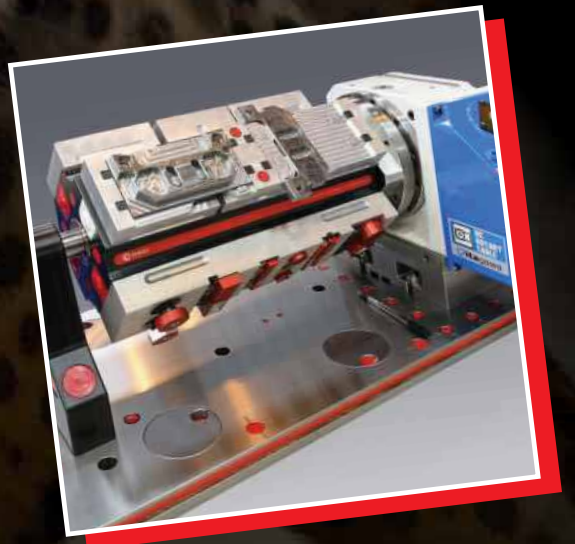
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# Fast and precise component workholding?

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# Standard or bespoke workholding: 1st MTA has the economical answer

Whether parts need to be held for prismatic metalcutting on a machining centre or for turning on a lathe, quick and reliable workholding is essential. Speed of loading and unloading during a batch run is needed to maintain production output and to lower unit manufacturing costs, while rigidity of clamping minimises vibration, leading to high machining accuracy and long tool life. The first prerequisite of any workholding solution is to provide secure and consistent location for the workpiece. Using traditional machine vices, a single workpiece is typically clamped by a moveable jaw against a fixed jaw, which normally deflects as clamping pressure is applied, making it difficult to achieve repeatable results.

In contrast, modern workholding systems such as Chick Qwik-Loks from Salisbury-based 1st Machine Tool Accessories squeeze the moveable jaws against a central fixed jaw, cancelling the opposing forces to provide a reliable reference point. Moreover, the units enable two components to be machined in a single cycle, rather than just one, immediately increasing productivity. To improve workpiece retention when machining castings rather than billets, Chick gripper inserts tilted to match the draft angle of the casting ensure maximum grip. Such advanced systems allow a modular approach to workholding, enabling productivity to be raised progressively.

Instead of Chick Qwik-Loks holding components directly, an aluminium faceplate with two machined recesses on the underside can snap onto the Qwik-Lok slide assembly in its base, after removal of the jaws. It allows the faceplate to be secured in seconds to a repeatability measured in microns, like during zero-point pallet change. The faceplate can then be used in conjunction with other workholding devices, such as Mitee Bite machinable clamps from 1st MTA, to secure dozens of components quickly.

To take better advantage of the available vertical space in a machining centre, components can be mounted on an indexing sub-system, such as Chick's System 5 ISS unit. Each comprises a Multi-Lok four- or six-sided tombstone mounted between a



4th axis indexer and tailstock on the table of a machining centre to present four, or six, components or sets of components to the spindle. Throughput and operator walk-away time are increased dramatically, the more so if several ISS units are mounted side by side.

Another clamping system in 1st MTA's range, which is particularly suitable for 5-axis machining, is the programme offered by BEST GmbH, Germany. The company is a leading manufacturer of low-profile, centric, self-centring, vices with high clamping forces up to 100 kN. Notable qualities are an ability to clamp on only 3 mm of material and  $\pm 0.01$  mm centring accuracy with five microns repeatability for manual and pneumatic vices, or one-micron repeatability for hydraulic types.

Two highly repeatable zero-point clamping systems for machining centres are also in the 1st MTA portfolio of products. One range is from Czech manufacturer V-Tech. The pneumatic quick-change system features powerful retraction of the clamping pin in each receiver and a positioning accuracy of better than 5 microns. A second zero-point system on offer is from Engineering Data, France, a long-established manufacturer of special fixtures that now uses its workholding equipment expertise on its own range of EasyBox robotic pallet storage and handling systems.

Finnish clamping equipment manufacturer OK-VISE is also represented in the UK by 1st MTA. Recent introductions are two new systems for checking how tightly a component has been clamped. During automated machining in particular, verifying holding force is always a challenge. The approach that OK-VISE has taken is to integrate measurement directly into the company's modular Multi-Rail RM fixturing system. An on-screen digital readout of clamping pressure from a Digiforce device enables the operator to verify that a hydraulically secured component is held correctly. A second device, Dotforce, allows the holding force of manually secured workpieces to be checked.

Most workholding solutions are compatible with Japanese-made Kitagawa rotary tables, which add 4th and 5th CNC axes to a 3-axis machining centre. Offered in the UK by 1st MTA, they reduce the number of separate machining operations and increase the complexity of parts that can be produced. Many options are available to complement the rotary table range, such as manual, pneumatic or hydraulic tailstocks, tail spindles with built-in clamping system, trunnion assemblies, rotary joints, air/hydraulic intensifiers, and manual, pneumatic and hydraulic chuck systems.

In the area of rotational machining, 1st MTA's workholding solutions include Kitagawa's wide range of jaw chucks and



collet chucks. An example of 1st MTA's bespoke problem-solving approach to workholding involved clamping an irregularly shaped automotive pump housing, in this case using a jaw chuck. The component has two through-holes in a flange that are specified to extremely close tolerances in relation to the central bore. In addition, the taper of the cast body called for a chuck capable of providing substantial pull back characteristics.

Following a detailed evaluation, 1st MTA recommended a purpose-designed back



stop and two jaws with a custom profile mounted in a Kitagawa power wing chuck with draw-down action. The solution was subsequently confirmed successful through a series of tests and the component is now in volume production at a leading component supplier to the motor industry.

Collet chucks have the advantage of applying clamping pressure evenly around the circumference of a part, leading to tight concentricity during turning. They also open and close rapidly, boosting productivity for both long and short runs. For example, a Kitagawa QCRL42 collet chuck supplied with requisite adapter plate is used on a twin-spindle Colchester lathe at Dawlish hydraulic equipment manufacturer, Hy-Pro. Machine shop manager Kevin Saunders prefers the collet design, as it allows higher accuracy of machined components and the inconvenience of having to set and bore out chuck jaws is avoided.

Another workholding product range recently introduced by Kitagawa is the KEM series of expanding mandrels for ID clamping, allowing full access to the outside profile of a component for machining. The number of operations can be reduced and the Takt time shortened, leading to more



economical production and better accuracy. A typical example of a special workholding arrangement using this equipment is a dual sleeve expanding mandrel system mounted on a lathe for internally gripping thin-walled pipe. Parallel expansion offers optimum accuracy and grip force and the sleeves are sealed for complete protection.

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# Leading workholding solutions

In 1939, two draughtsmen from Coventry went into business together and Brown & Holmes was born. Now based in Tamworth, Brown & Holmes has built a formidable reputation for delivering superior quality workholding, precision machining and subcontract machining solutions.

Brown & Holmes is one of the leading providers of workholding solutions in the UK. Based in Tamworth, Staffordshire, it offers a complete, bespoke, workholding service. Its engineering solutions enable customers to improve the consistency and quality of their product as well as increase productivity.

As well as supplying nationally, to a wide range of end-users and subcontractors within the UK and Ireland, the company also export to Asia, the Middle East, Europe, Africa and America. It has broadened its services over the years to offer high-quality workholding, automation, mechanical handling, machining services and Internationally renowned products to the automotive, aerospace, power generation, nuclear, construction and machine tool industries.

A great deal of its success can be attributed to its commitment to training. Many employees have been with the company since starting work and it trains new apprentices every year.

Its skilled engineers will work with customers from concept, design and manufacture, through to installation and beyond, to a timeline to suit requirements. Brown & Holmes works with all size of companies from International organisations to independent businesses. From designing and manufacturing a workholding fixture, for an automotive turbo charger, to a



3.5 tonne power generation cylinder block, it offers the same attention to detail and commitment to customer satisfaction whatever the size of project.

By keeping services in-house, it maintains the highest standards. Quality is monitored at every stage of development and metrology calibration is traceable to National and International standards.

### Specialists in fixture design and manufacture

Brown & Holmes specialises in the design and manufacture of workholding fixtures. It supplies to customers within the machine tool, construction, power generation and nuclear industries, however it offers particular expertise within automotive and aerospace sectors. For example, the company are skilled at designing and manufacturing aerospace component fixtures and blade fixtures. It has years of experience in supplying automotive powertrain component workholding solutions and it is able to offer fully automated, robot loading workholding fixtures for blue chip companies and Tier 1 suppliers.

### New premises at Brown and Holmes

In July, Brown and Holmes announced a further expansion, with the opening of an additional site on Anders, Lichfield Road Industrial Estate in Tamworth.

The facility is conveniently located close to its existing premises and will house a new robot demonstration area and a dedicated apprentice training section as well as manufacturing, assembly, test and inspection facilities.

Having refurbished and upgraded the unit, it gives Brown and Holmes an additional 9,000 square feet of manufacturing space. Investment in five additional machines has been made to



complement its existing manufacturing of workholding equipment, as well as equipment to provide a lifting capacity of 10 tonnes.

The new demonstration robots are a key part of its customer experience area and will also be used on its apprenticeship scheme and staff training.

### Technical support to keep production lines moving

The company takes pride in customer service and its commitment does not stop when its solutions are delivered. It provides an ongoing tooling and installation support, and full technical back-up, to all of its customers.

It offers a 24-hour reaction service, as well as a planned maintenance programme, for workholding fixtures and mechanical handling to maximise production uptime.

Different companies have different technical requirements, so Brown & Holmes will work on-site with customers shop floor teams to assist with any installation, training and maintenance support they need.

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## A new member of the Hainbuch end-stop systems family

### Small, inexpensive and efficient

Clamping specialist Hainbuch is now offering users of its mini-series, or the earlier Toplus or Spanntop chucks, a clever part that saves time and costs into the bargain. The vario part and vario quick end-stop systems, already in the product portfolio, are joined by a third variant: the vario flex. The pneumatic workpiece ejector ejects the workpiece from the chuck automatically. The pneumatic workpiece ejector depth can be adjusted flexibly by means of a clever retaining mechanism and positioned in the machine exactly as required for the workpiece. This automated function increases process security and reduces cycle times. The vario flex workpiece ejector can also be used as a basic end stop for coolant wash or air flush. To do this the pneumatic spring is removed and a feed tube is attached. The optional workpiece specific end stop, with holes for the wash and air flush, can then be mounted directly on this flexible interface.



### Two systems, even more flexibility

Valuable time can be saved using the standardised end stops. Setup times are drastically reduced and the user always has the right end-stop ready to hand. Whether to use vario quick or vario part is just a matter of preference. For precise, rigid clamping, Hainbuch recommends using the vario part system. It works on the same principle as a gauge block, and its height can be finely adjusted in 1 mm steps with gauge discs. With an axial run-out of < 0.02 mm at the part of the end-stop that touches the workpiece, vario part is ideal for machining finished parts. The vario quick variant is intended for fast, flexible clamping. It has a precise, trapezoidal thread screw to allow the clamping length to be adjusted quickly. A half-turn is equivalent to an axial adjustment of 1 mm. Hainbuch also offers end stop blanks for workpiece or front end stops.

More than 65 years ago HAINBUCH started in a small garage in Germany. Over the years its customer family has grown to include manufacturers in industries as diverse as automotive, aerospace, medical tools and appliances, energy, and pure research.

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# Interface for process-reliable machining

Schweiger GmbH & Co. KG from Uffing, Staffelsee in Bavaria specialises in one of the most demanding industries: the automotive industry. For managing director Anton Schweiger and his approximately 75 employees, this means having to meet the highest standards of precision and quality with every injection mould produced. Additionally, they are competing in a global market, which, among other things, is subject to enormous cost pressure.

However, facing the strain of global competition, the qualified toolmaker and his team adjusted and positioned themselves accordingly. They rely on an automated process chain which ensures absolute security and ends with injection moulds that meet all requirements. In 2016, for example, the company built a new production hall and invested in two DMC 210U and 270U 5-axis DMG MORI machining centres, which are capable of processing even XXL components in one clamping operation. Equipped with an appropriate pallet automation, the machines run around the clock seven days a week and all with just one-person shifts. On weekends, they run completely unmanned. This requires highest process reliability across all relevant components and functions.

In this respect, Anton Schweiger has also focused on tool clamping technology, the often-overlooked interface between spindle and tool. It bears great responsibility for the quality of the machining, the service life of the spindle and the tool life. The milling specialists at Schweiger swear in this respect by the support and counsel of



Haimer GmbH, Igenhausen. In 40 years, the family-owned company has become a market leader for tool clamping technology in Europe and is considered to be a leader in tool shrinking and balancing technology.

### Quality makes the difference

For Andreas Orterer, production manager at Schweiger, the main argument for this strong partnership is the quality delivered by Haimer: "With Haimer products, we can be sure we will always receive the quality that meets our high standards. Schweiger currently uses thousands of Haimer toolholders with shrink fit technology. In addition, there are two power clamp shrinking devices and a tool dynamic balancing device in the production. Andreas Orterer adds: "From Haimer, we get all tooling from a single source, which suits us very well. In addition, you notice the shrinking and balancing devices have been

developed by machinists, they are easy to use and lead to fast results."

This is also true for the Microset presetter UNO autofocus 20 | 70, which has its place between the shrinking and the balancing devices at Schweiger. This machine has become a 'Haimer' product since the Bavarian company took over Microset Tool Presetting Technology in Bielefeld at the beginning of 2017. Compared to the manual version, the UNO autofocus is able to automatically focus the cutting edge for measurement of the C-axis. Especially when it comes to tools with several cutting edges on the circumference, this option proves to be enormously time-saving. All in all, the device allows setup time reductions of up to 70 percent just from presetting outside of the machine.

Andreas Haimer, managing director of Haimer GmbH, explains: "With the acquisition of Microset Tool Presetting Technology we have become a system supplier for tool management. Microset perfectly complements our existing portfolio of high-precision tooling, clamping, shrinking and balancing technology, in such a way as to enable us to provide even greater support to our customers."

### Automatically highest runout accuracy

The level of satisfaction Anton Schweiger, vice president of the Association of German Tool and Mould Makers (VDWF), has in his partnership with Haimer and his toolholders can be measured by the fact that he has been using them for more than two decades.

When the toolmaker bought the first HSC





machine about 20 years ago, he switched from mechanical collet chucks to Haimer shrink fit chucks because of the improved runout accuracy. Compared to the products of other suppliers, the Haimer shrink fit chucks won him over with its superior quality.

Anton Schweiger says: "A company goal that Haimer and ourselves have in common, if you take the example of the shrink fit chucks, this can be seen in the runout accuracy, which is, by default, below 3 µm."

This is an important prerequisite for the toolmakers from Uffing. After all, they do not produce injection moulds for cheap consumables, they create highly sophisticated moulds used in premium vehicles, for example used to make headlight end plates in 2-component injection moulding. These customers place high demands on the end products and do not accept the slightest blemish. Accordingly, the injection moulds have to meet similar requirements: as a rule, surfaces should be smooth as glass and tolerances of less than 2/100 mm must be maintained.

One of the company's main areas of focus

in production is the milling of large complex moulds, whereby individual workpieces can weigh up to nine tonnes. The cavities are often very deep. Typically, between 300 to 400 mm, sometimes even up to 500 or 600 mm deep. This requires slim shrink fit toolholders, the use of shrink fit extensions as well as tools with extremely long shanks.

### A long tool life enables unmanned operation

In general, a longer spindle life means considerable costs savings, but the tool life is even more important in automated production.

Schweiger machines many large injection moulds automatically in one clamping operation, for 40 to 50, sometimes even 100 hours, non-stop. A broken tool or even a spindle damage during unmanned operation would be fatal. In addition, a rigid and stable connection is important to achieve the requested surface quality.

Anton Schweiger says: "A key to this is the Haimer toolholders, they enable process-reliable machining."

Not every requirement of the toolmaker can be optimally fulfilled with standard toolholders. Anton Schweiger especially



appreciates the close cooperation with the Haimer specialists and the flexibility of the company in Igenhausen.

Anton Schweiger concludes: "For us it is important that Haimer listens to the users. These toolholders are perfectly adapted to the tool diameter and the respective cavities. That is how I can, without any concerns, let the machines work without supervision, even for roughing."

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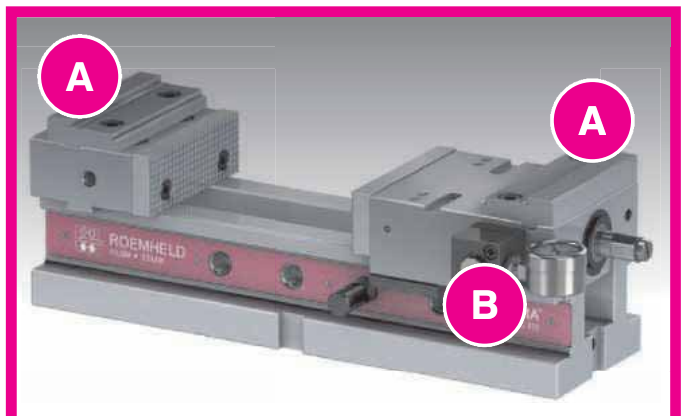
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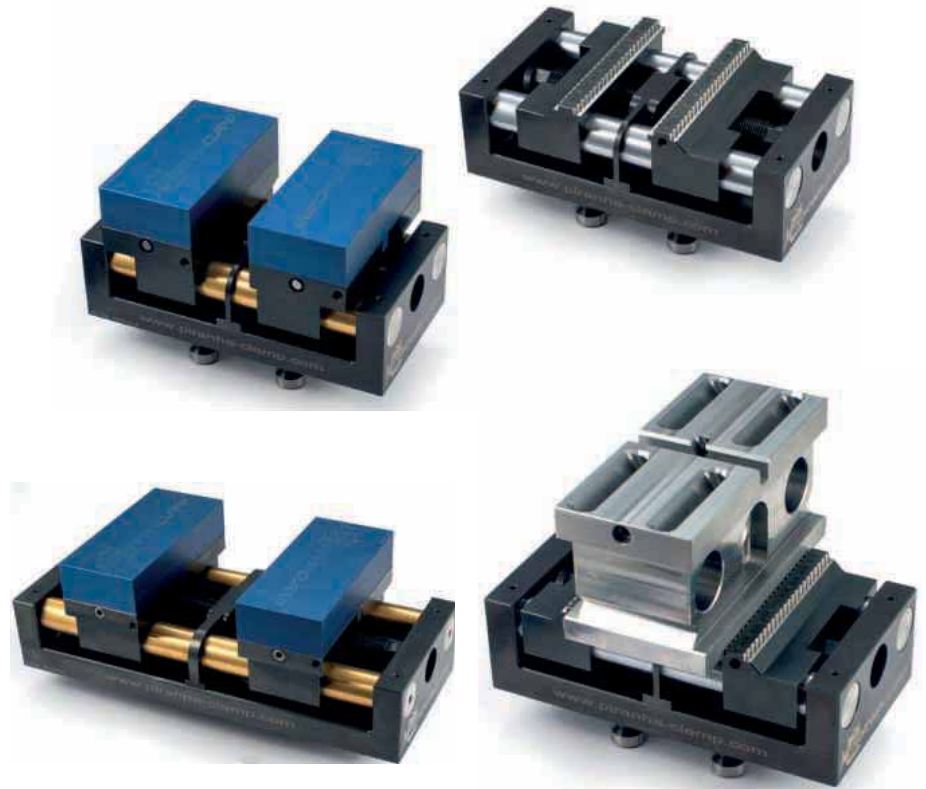
# Piranha range takes a bite out of production inefficiency

Available from Leader Chuck Systems, the Piranha Clamp range of high precision centring vices is 100 percent Swiss manufactured and offers a number of performance advantages for machine shops using prismatic machining techniques.

It is no coincidence that the vice range is called Piranha, named after a fish that has a reputation for a strong bite and, relative to body mass, achieves one of the most forceful bites measured in all vertebrates. In place of the usual dovetail guides found on many vices the Piranha features parallel, twin cylindrical jaw guiding bars that ensure high precision and an unbeatable clamping force. Designed to act much like a hydraulic press, the hardened and specially coated spindle guides provide an increased surface area for load distribution, whilst the drive spindle has been tested to withstand pressures above 1,300 Nm<sup>2</sup>.

This capability supports high pressure workpiece clamping with a minimal depth of just 3 mm, so raw material waste is kept to a minimum. The nature of the twin guide design results in an open construction for easy chip evacuation, with any swarf flushed away by the coolant, and an extremely low construction height that makes the most of any machining centre's working envelope. The very low built-in zero-point clamping system on the base of the Piranha Clamp also provides the optimum interface with the machine tool's worktable and achieves a repeatable loading accuracy of 0.01 mm as standard. The quick-change location system requires less than half a turn to lock and unlock and it can be specified to fit any existing manufacturers' zero-point design making the vices totally interchangeable.

Two base sizes are available: the Piranha Clamp 170 is 170 mm long by 90 mm wide, while the larger Piranha Clamp 300 is 300 mm long by 120 mm wide. The base can be specified with changeable top jaws where a patented quick-change system for the jaws uses an eccentric 'cam' pin to support production efficiencies. Within just a few seconds, and only a quarter turn of the locking key, a wide range of different standard or pre-machined clamping jaws can be quickly and accurately exchanged. These include aluminium and steel 'soft'



jaws, that can be machined to profiles that match the workpiece, as well as straight and serrated 'Snapper' jaws designed to secure raw billet materials.

Alternatively, the vice can be specified in 'Snapper' format, where the base is fitted with serrated jaws as standard. The two rows of teeth on the Snapper jaw face effectively 'bites' into the raw material, pulling it down with the bottom row of teeth and providing an extremely secure hold with the upper row for aggressive machining applications. With the Snapper jaws the raw material does not require pre-stamping saving time on every workpiece machined, the initial capital expense of purchasing the necessary hardware to perform the stamping operation and the on-going regular expense of sending the stamping dies back to the vice manufacturer for regrinding.

Managing director, Mark Jones concludes: "Designed for the efficient processing of prismatic components or billet raw material, especially using simultaneous 5-axis machining techniques or aggressive raw material removal toolpaths, the Piranha Clamp range of centring vices, with Snapper or changeable jaws, can improve the

precision and productivity of almost any machine shop. The clamping forces achieved are phenomenal and, as you would expect from a Swiss manufacturer, the quality and precision is class leading. Tested against established vices that use pre-stamped raw material, at the same clamping pressure, the deflection measured in the Piranha range is just one-tenth of that measured in the competitor's vices. This makes the vice more accurate for both first operations and more repeatable for second operation work."

Leader Chuck Systems has an enviable reputation for the in-house design and production of Leader chucking, stationary clamping, gripping and workholding products. A respected brand name for high quality equipment with more than 60 years' experience, the company also stocks products from the very best suppliers.

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# JJ Churchill reduces machining operations by half with Blue Photon

Aerospace engineering firm JJ Churchill has announced that it has reduced its tooling costs by 5 percent with a 50 percent reduction in the number of machining operations on a specific critical part. This has been achieved with Blue Photon technology which is marketed in the UK and Europe by NCMT Ltd.

This technology is applied to a titanium aluminide aerofoil blade component which is an extremely difficult material to fixture and machine. Blue Photon fixes the component to the tool with an adhesive which, cured under UV light, is strong enough for the most rigorous machining techniques including 5-axis CNC. The process is a replacement for encapsulation, providing reduced fixture complexity.

Each machining operation can need its own fixturing, so any reduction in the number of operations will have a huge impact on the efficiency of the process. The reduction in machining operations are achieved by fixing onto a single face of the component, as opposed to potentially many-faced attachments.

Locating on a single face provides access to other faces, enabling several complex features to be machined at the same time. This delivers greater precision during machining, with much tighter tolerances achievable between features. It ultimately reduces the amount of metal wasted/scrapped, providing resulting benefits.

Once the blade root and tip has been machined, held using the Blue Photon technology, the workpiece is transferred to a Starrag 5-axis machining centre, in this case a 28 kW/18,000 revs/min LX051. The workpiece is held in specifically developed fixturing for the fast and effective complete machining of the aerofoil from forged blanks that are, at most, 5 mm oversize.

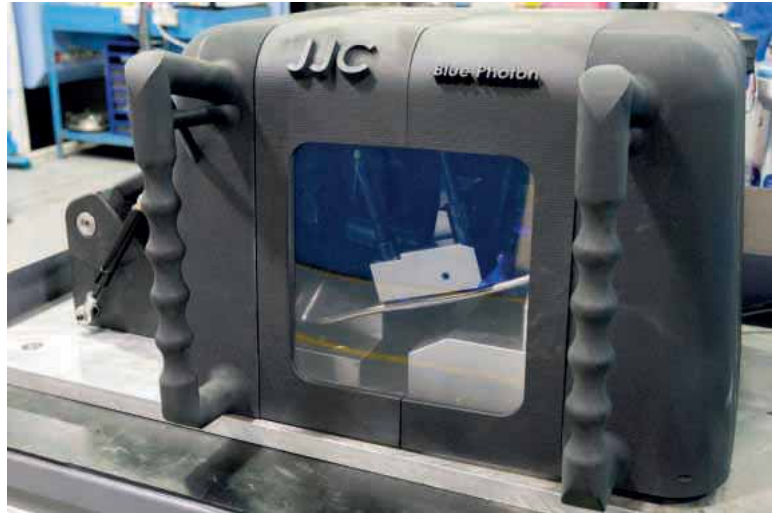
The impact on JJ Churchill's overall production is to increase capacity which is essential as the company continues its high growth trajectory, while also benefitting the environment, another of JJ Churchill's key performance measures. Using Blue Photon reduces the energy, electricity, required for the process.

The current encapsulation method requires a molten metal case being applied to the part to aid holding, a process which requires significant energy to heat the encapsulation material to a sufficient temperature. In comparison, Blue Photon uses a 12 V low power UV curing box.

Mark Cooper, JJ Churchill's managing director, says: "Blue Photon has substantially increased the capacity and accuracy of our machining operations. We have always manufactured the highest quality components.

"Now we can do it more quickly and more precisely than before. We will build on this by continuing to invest in the latest technology and apply it to the benefit of our aerospace and power generation customers around the world."

Adrian Maughan, NCMT engineering director, says: "Blue Photon technology enables engineers to realise benefits not possible previously with mechanical fixtures alone. JJ Churchill has utilised the Blue Photon technology in a very innovative way to deliver productivity benefits for its customers."



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# When the dreams of logisticians come true

With its drone grippers, RÖHM shows what will be possible in the future in in-plant logistics

What was a future vision a few years ago is tangible reality today. With its drone gripper, the clamping and gripping specialist, RÖHM is making the wishes of in-plant logisticians come true. This is because the gripper enables the unmanned transport of tools or other products in production halls. All of this harbours enormous future potential. The gripper came into being in cooperation with the Fraunhofer Institute for Industrial Engineering (IAO) and the Industry 4.0 experts from Digital Worx.

Drones show images from impressive perspectives and deliver packages. In the future, they will offer even more support from the air. The possibilities are almost endless and a great deal that will be just a matter of course in the future seems to be unimaginable today. Here, it is not enough for the drones to fly from one point to the next for complex handling tasks. They must perform other tasks above and beyond this. For example, products have to be gripped reliably and accurately and distributed unmanned in the shortest possible time. This challenge is also found in innumerable manufacturing companies worldwide.

The fact that this can already be reality is shown by RÖHM with its new drone gripper. Moreover, it provides other features that are needed for effective work and easy operation. The gripping technology specialist has an indirect and a direct



gripping system in its programme for a great variety of applications. With the indirect gripping system, the drone flies with the mounted gripper and approaches an object equipped with an adapter ring. It can be a rectangular container, for example. With the optional limit switches, which are placed around the gripper at  $3 \times 120^\circ$ , it is possible to check the correct position of the gripper. As soon as all three limit switches send a signal, caused by resting on the adapter ring, the electrically powered servo motor can be triggered.

With the direct gripping system, the drone flies with the mounted gripper to the object directly and accurately. In the process, the drone is first of all positioned exactly. During the landing, the dead weight of the drone is cushioned by centrally located damping and ensures that the drone lands gently, and simultaneously the curved gripping surfaces are uncovered. The servo motor controls how the gripping arm swings out. The gripping process is supported by lead-in chamfers on the gripper arms.

Typical of RÖHM, the system is very service friendly. No lubrication is required for smooth operations, and the long-lasting servo drive is electric. An integrated damping system is included for gentle docking on delicate parts as well. In addition, the gripper jaws can be individually adapted. And the gripper offers even more: the jaws are printed by RÖHM using an additive process. In this way, even complex shapes can be gripped. RÖHM

offers self-centring in part, which makes the handling even easier.

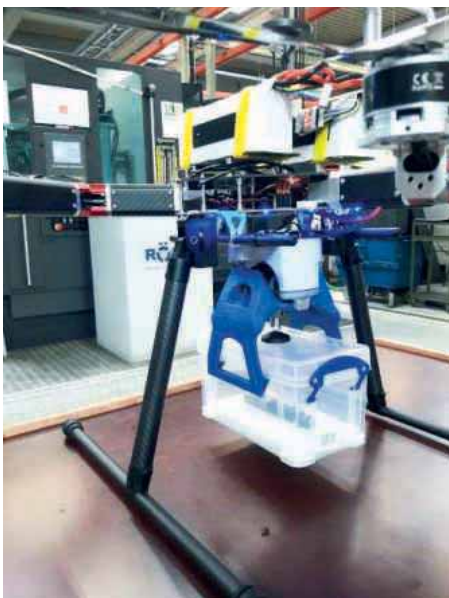
Logistics drones will not be the only and ultimate solution in each of these areas, but they can at least meaningfully expand the "mix" of delivery possibilities in many cases. Sometimes in large-size company buildings, the drones can take over hundreds or thousands of "delivery flights" each day. The autonomous navigation in indoor environments is a major challenge due to the complexity and dynamics of the environment.

Founded in 1909, RÖHM is now one of the leading chucking tool manufacturers with a wide and powerful product range.

The company offers drill chucks, live centres, lathe chucks and vices, gripping technology, power chucks, cylinders and mandrels, tool clamping systems and a major potential of special designs.

When it comes to efficient clamping devices, RÖHM is able to offer everything the customer needs. To produce products which meet the highest expectations, all requirements from the consulting, over the engineering and production up to the service are fulfilled right from the start. RÖHM is regarded as a driving force which has a decisive influence on how progress develops.

**ROHM (GB) Ltd**  
**Tel: 020 8549 6647**  
**Email: rohmgb@roehm.biz**  
**www.uk.roehm.biz**



# Kurt vices for a wide variety of mounting options

Mounting newer Kurt vice models is easier, faster and more precise. Through the use of Sine Keys, vice alignment and lockdown is simplified. Kurt Sine keys are positioning devices that insert and lock quickly, and accurately, into pre-drilled dowel holes in the base of every newer model Kurt vice. They provide for fast mounting of vices onto t-slots, machine tables, grid plates with pre-machined hole patterns, sub-plates, fixture plates and tombstones.

Kurt Sine Keys are an improvement over traditional bolt-on keys used to locate vices on mills and machine T-slot beds. Bolt-on keys require mounting and unmounting using a hex wrench and SHCS screws which are tedious and slow.

By comparison using Kurt Sine Keys, no screws or wrenches are needed. They insert smoothly into pre-drilled dowel holes in the base of the vice and the Sine Key O-ring locks them into position accurately. For unmounting, they release just as quickly.

The pre-drilled dowel hole pattern in the Kurt vices, also eliminates the need for a machinist to drill its own hole patterns for

mounting purposes and risking potential damage to the vice and voiding a warranty.

All new Kurt vice models incorporating the Kurt Sine Key Dowel hole feature include: DX4 and 6 series, 3400, 3600 and 3800 series, HD690 series, XL6 series, HDL 4 and 6 series and HDM6 vice series.

For further details and an overview video, visit [www.kurtworkholding.com/mounting](http://www.kurtworkholding.com/mounting)

Kurt's mission is to provide the highest quality workholding products and solutions whilst developing the most innovative new products and services to meet its customer's changing needs.

Kurt brings more than four decades of experience in providing solutions to CNC machine workholding problems and a deep understanding of how workholding integrates into today's quality driven manufacturing process.

The company provides the complete spectrum of workholding solutions, from a full line of single and multiple station vices, to complete modular vice systems, to custom engineered workholding. It has built its reputation, as a workholding specialist, by assisting automotive, aerospace and other metalworking-intensive industries to improve quality and reduce cycle times.

**Kurt Manufacturing Company Tel: 001 8772267823**  
**Email: [workholding@kurt.com](mailto:workholding@kurt.com) [www.kurtworkholding.com](http://www.kurtworkholding.com)**



# More productivity, less cost

Available exclusively from REM Systems, the F-Tool CentroClamp 180UP is aimed at 5-axis machine tool users running both manually loaded single piece workflow and full or partial automation.

Managing director, Ian Holbeche says: "While developing the CentroClamp the focal points were function and good value. So, it can be used in 5-axis machining centre applications that are loaded manually or automatically, where a wide variety of workpiece sizes must be clamped. As a universal clamping device, it simplifies the programming and targets fast component

change, even at a batch size of one, with shorter changeover times, greater flexibility and subsequently higher production output at a lower cost."

The CentroClamp 180UP has a tightening torque of 60 kN providing a jaw pressure of 18 kN. Over a clamping range of 18 to 125 mm with standard jaws the vice has a repeatability of +/- 0.01 mm. A wide variety of jaws are available to suit most applications. An adjustable Zero Point base makes the vice compatible with most proprietary pallet and automation systems available, such as the Erowa range also available from REM systems.

One of the key jaw options is the F-Tool 'clamping jaws can be fitted and used for clamping raw material and components, as well as for loading pre-punched parts that can be remounted with high repeating accuracy. Besides the pull-down effect, the fixing teeth also feature a reference mark, which reflects a known datum position of the part. Non-ferrous metals, plastic, aluminium and steel can be very quickly and tightly clamped in the grip area to only 3 mm in



height for five-sided and full 5-axis machining.

Offering even more powerful grip is the F-Tool pneumatic/hydraulic precision angle lock vice FT-PH-130V. A precision vice with integrated pneumatic/hydraulic aggregate system that offers a jaw clamping pressure of up to 60 kN. With a 6 mm hydraulic stroke for the fast clamping and unclamping of workpieces, the vice has a quick manual adjustment over its 0 to 150 mm travel range, so it can be quickly adjusted to suit the workpiece.

**REM Systems Ltd**  
**Tel: 01452 750581**  
**Email: [sales@remsystems.co.uk](mailto:sales@remsystems.co.uk)**  
**[www.remsystems.co.uk](http://www.remsystems.co.uk)**





# ITC drills provide 400 percent cycle time improvement

In 2016, Surrey-based GPR Ltd made its first strides from 3- to 5-axis machining and it was Tamworth cutting tool manufacturer Industrial Tooling Corporation (ITC) that fully supported the subcontractor in selecting the optimal tooling solution for the new machine. Two years after the Matsuura MX-520 was installed, to complement the company's 3- and 4-axis HAAS machining centres, ITC technical sales engineer, Dave Cleeve has once again stepped-in with a solution.



The relationship between ITC and the Camberley subcontractor company spans almost 15 years and, during that period, ITC has always been on-hand with its extremely vast product range that is backed by first class technical support. In the last five years, ITC has massively added to its product portfolio with the addition of BIG KAISER tooling and toolholding products and the inclusion of the Widia indexable insert turning, drilling and milling lines that add to the already impressive range of UK manufactured ITC solid carbide tooling.

Always endeavouring to provide a complete solution for customers, ITC has continually met the needs of GPR with its unsurpassed product lines. When GPR installed its Matsuura, and received a contract for Hooke Joints used on Earthquake simulation tables, ITC fully tooled the new machine with everything from Widia M200 indexable shell mills, BIG KAISER BBT40 toolholders with face mill

adaptors, BIG KAISER HMC milling chucks, WIDIA 5777 Series solid carbide end mills, standard and extended length WIDIA VariMill 2 end mills with the WIDIA HPV shrink fit toolholders, 7-flute VariMill 3 Series tools, the 47N0 Series ball nose tools and much more. It is the unparalleled service levels and extensive product portfolio that now sees ITC supply more than 50 percent of GPR's cutting tools.

Dave Cleeve suggested the Widia range of VDS solid carbide thru-coolant drills to eliminate tool failures and the associated time and costs involved with changeovers. GPR also wanted to improve the cycle times for drilling operations.

Each of the four centre guides had an overall cycle time of one hour 10 minutes and the application of the Widia VDS drills immediately reduced the cycle time to 49 minutes. This 20 minute reduction per part is credit to a number of factors that include the elimination of tool burnout and subsequent changeovers, the ability to run the VDS drills at higher speeds and feeds and also the ability to feed the drill straight through the part with no pecking cycle. The thru-coolant feature on the VDS drills eliminated pecking cycles by flushing the swarf away from the cutting area whilst keeping the cutting edge at its optimal operating temperature.

Commenting upon the success of the VDS drills, Vernon Ward says: "We completed the entire batch of 80 sets that consists of



480 parts and approximately 24,000 holes with a single set of drills. Upon completion of the project the VDS drills are still in an 'as-new' condition. The drills may have been more expensive than our previous drills but they paid for themselves by the time we machined 20 parts."

The VDS drills had an immediate payback on the aluminium components and it wasn't long before the Surrey subcontractor enquired about drilling holes in Duplex. The inherently challenging stainless-steel grade is commonplace in the oil & gas industry and when GPR won an order for drilling oil well monitoring equipment, ITC again recommended the flexible VDS drilling range.

The batch of 10 Duplex bars required four 10 mm deep holes per part and with a pre-drilling and drilling cycle, the complete drilling time was four minutes 58 seconds per part. Upon completion of the small batch run, GPR won an order for a consecutive 130 parts. Aiming to reduce this cycle time on the company's HAAS Mini Mill, GPR approached Dave Cleeve who suggested the 3XD VDS drills in 3.2 mm and 4 mm diameters. Unlike the thru-coolant solid carbide drills applied on the Matsuura, the drills used on the Mini Mill were used with flood coolant. Despite not having the thru-coolant facility, the drills reduced the cycle time from almost five minutes to just 44 seconds, a cycle time reduction of over 400 percent.



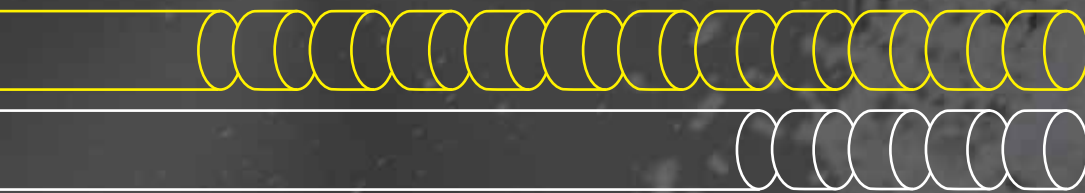
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**Tel: 01827 304500**  
**Email: sales@itc-ltd.co.uk**  
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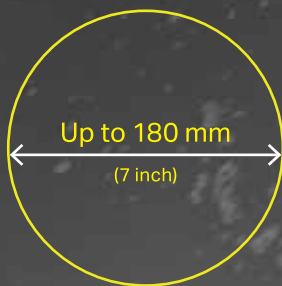
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# CERATIZIT Group generates strong interest at Farnborough



Nathan Paxton concludes: "Our commitment to working with the AMRC has opened up many new opportunities for us as a group and it highlights our determination to provide the best solutions to any aerospace machining applications that we may be presented with."

For over 95 years, CERATIZIT has been a pioneer developing exceptional hard material products for cutting tools and wear protection. The privately owned company, based in Mamer, Luxembourg, develops and manufactures highly specialised carbide cutting tools, inserts and rods made of hard materials as well as wear parts. The CERATIZIT Group is a leader in several wear part application areas, and successfully develops new types of carbide, cermet and ceramic grades which are used for instance in the wood and stone working industry.

With over 9,000 employees at 34 production sites and a sales network of over 70 branch offices, CERATIZIT is a global player in the carbide industry. As a leader in materials technology, CERATIZIT continuously invests in research and development and holds over 1,000 patents. Innovative carbide solutions from CERATIZIT are used in mechanical engineering, and tool construction, and many other industries including the automotive, aerospace, oil and medical sectors.

CERATIZIT UK & IRELAND's decision to exhibit at the Farnborough International Airshow has paid dividends with strong interest in the Group's aerospace capabilities throughout the event. The four key brands in the group: Cutting Solutions by CERATIZIT, Klenk, Komet and WNT, was represented to highlight the combined expertise at hand for those manufacturing companies operating within the aerospace sector.

The CERATIZIT Group has a longstanding association with the aerospace industry, with cutting tool products aimed squarely at that sector of the market. These include Klenk one-shot drills for use in airframe assembly, the WNT AluLine solid carbide cutters with DLC (Diamond Like Coating) for milling aluminium and the recently launched CTCS245 milling insert grade, developed by CERATIZIT's industry solutions team specifically for milling nickel-based alloys in the aerospace market, but now seeing applications further afield.

Nathan Paxton, UK & Ireland business development manager, says: "As a Group we have a wide variety of cutting tool solutions for the aerospace sector, and the diverse range of materials found within it. In addition, we have the applications expertise to work with customers to define the optimum metalcutting solution in order to maximise productivity and reduce manufacturing costs."

This expertise was recognised at Farnborough, with many existing and potential customers taking time to discuss specific projects with the CERATIZIT specialists who were on the stand. CERATIZIT UK & IRELAND has worked closely with aerospace customers for many years, but these relationships have now been strengthened following the decision by the Group to become a Tier One Member of the Advanced Manufacturing and Research Centre in Sheffield.



The internationally active CERATIZIT Group unites the four competence brands of Cutting Solutions by CERATIZIT, Hard Material Solutions by CERATIZIT, Tool Solutions by CERATIZIT and Toolmaker Solutions by CERATIZIT. The carbide expert also includes the subsidiaries WNT and CB-CERATIZIT, as well as the tool manufacturers Günther Wirth, PROMAX Tools, Klenk, Cobra Carbide India, Becker Diamantwerkzeuge, Best Carbide Cutting Tools and KOMET.

**CERATIZIT UK & IRELAND Ltd**

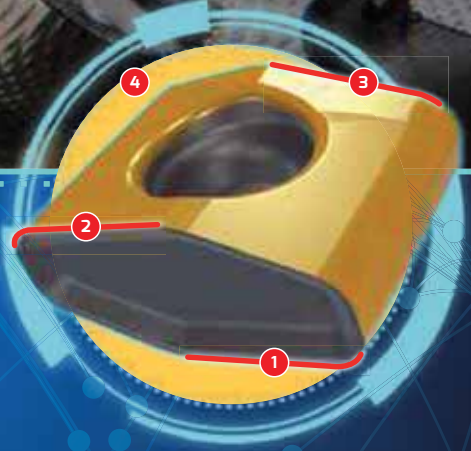
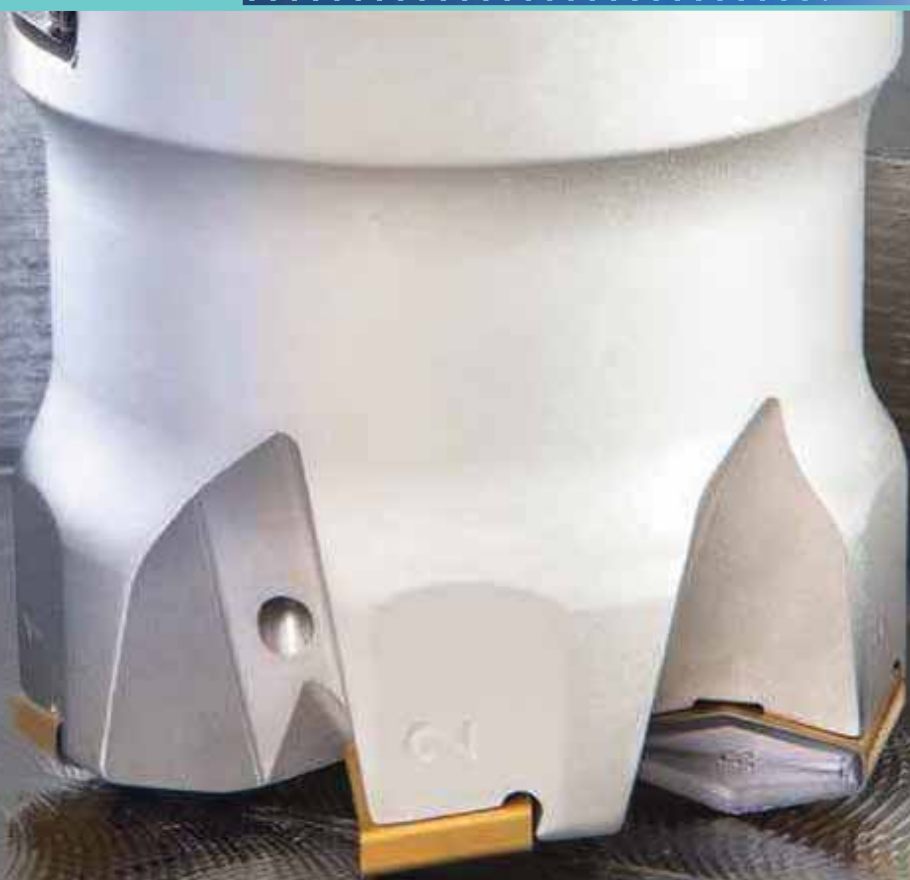
**Tel: 0800 0732073**

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# The LOGIQal conclusion

Back in March, in a blaze of publicity, 300 people witnessed the biggest cutting-tool launch in ISCAR Tools history at the ICC in Birmingham. Since this time, as the comprehensive new ISCAR LOGIQ range offers highly efficient solutions to the vast majority of machining operations and materials, many end-users have switched to LOGIQ cutting tools. Here, ISCAR UK sales manager, David Jones explains the success of ISCAR's all-embracing new range.

Charles Eames, the famous US designer, once said: "Recognising the need is the primary condition for design." Observing this wise maxim, ISCAR employ a team of industry specific machining experts who are able to act as a bridge between companies involved in all aspects of metal cutting and ISCAR's Research and Development team. The invaluable, continuous feedback delivered by ISCAR's industry specific experts to our prolific R&D team, enables global industries' diverse and ever evolving needs to be recognised and to be acted on.

In addition to the invaluable intelligence received from global industry, ISCAR's staff work closely with the world's leading machine tool manufacturers to ensure that the company is kept aware of all new technical developments. Last but not least, ISCAR's metallurgical experts constantly monitor advances across all classes of materials.

This unceasing flow of high-grade information ensures that, rather than launch a cutting tool solution then look for a machining problem to solve, each of ISCAR's products are painstakingly researched and when launched constitute highly-efficient, cost-effective solutions to real-world machining problems.

As many of ISCAR's recent R&D programs were nearing completion at approximately the same time, and as each new product series represented a major advance in a particular aspect of machining, rather than launch every cutting tool range separately, the obvious synergy between each new ISCAR product suggested that a major, mass launch was the way forward.

### The application of LOGIQ

Why LOGIQ? ISCAR has taken the company's very successful IQ concept of machining intelligently even further by applying a wide range of logical



developments to cutting tools. The application of LOGIQ has allowed the creation of advanced new ISCAR ranges, it has enabled existing product lines to be further upgraded and has also inspired many innovative new product series that assist users in maximising equipment utilisation and optimising performance.

### Perfect timing

When the LOGIQ range was launched in the UK earlier this year, the subject of productivity was near the top of the political agenda. ISCAR LOGIQ's focus on boosting users' output, increasing efficiencies and improving machine tool yields, chimed perfectly with the Government's push for increased productivity. Also, immediately after its launch, the advanced new ISCAR LOGIQ range made its MACH 2018 debut. As the high-profile LOGIQ launch had prompted many potential users to visit the ISCAR stand, our staff was kept busy throughout the exhibition explaining the multiple benefits of the new range and making appointments to visit potential users.

### The LOGIQ of Industry 4.0

In an age when sophisticated process monitoring, and instantaneous acquisition of machining data, is becoming increasingly important, the instant availability of state-of-the-art manufacturing consumables, such as advanced cutting tools is equally vital.

To ensure the most appropriate cutting tool is always available when needed, tools can be stored in Iscar's range of 'smart' Matrix vending machines that can be integrated into customers' advanced management systems.

The installation of a vending system is motivated by users need to guarantee the instant availability of tools that will ensure that production does not stop. In addition, businesses see the implementation of a vending machine system as a way to minimise the cost and risk of stock ownership by optimising stock levels

### The proof of the tool is in the cutting

Since the end of the MACH exhibition, to help prove the spectacular machining efficiencies that can be achieved by the use

of LOGIQ cutting tools, ISCAR sales engineers have performed multiple machining trials in existing and potential customers' premises in all parts of the UK. This has resulted in many users of other cutting tool brands converting to ISCAR LOGIQ products. As further cutting trials are due to be made in the near future, it is anticipated that many other users will soon switch to the use of LOGIQ cutting tools.



The extremely positive feedback we have received from ISCAR LOGIQ users indicates that in all cases, the promised machining performance improvements have been realised, and in many cases exceeded. Impressed by their early experience, numerous customers are now investigating other company machining processes that could benefit from the impressive efficiencies already delivered by the use of ISCAR LOGIQ cutting tools.

The multiple advantages provided by the use of ISCAR LOGIQ cutting tools can be illustrated by the recent turning trial conducted within the UK on an application related to the machining of stainless steel. The customer was using a premium grade carbide tool provided by a major global cutting tool manufacturer. With the use of the recommended LOGIQ 4 TURN cutting tool, cutting speeds were able to be raised from 114 m/min to 134 m/min and feeds boosted from 0.2 mm/rev to 0.22 mm/rev. In addition, the depth of cut was increased from 0.75 mm to 2.15 mm and the number of passes needed dropped from 3 to just a single pass. As the hard wearing LOGIQ product resulted in the production of 9,000 parts per cutting edge, compared to a previous 3,000, not only were far fewer cutting tools needed for production runs, much less time was lost in stopping to change cutting tools. As well as producing comma/helical chips, rather than the previous tangled chips and also enhancing the part's surface finish, the advanced LOGIQ 4 TURN tool improved many other machining parameters, such as raising metal removal rates from 16.04 cm<sup>3</sup>/min to 53.69 cm<sup>3</sup>/mm. The impressive trial data, verified by the staff of the company concerned, proved that a remarkable saving of 72.3 percent would be achieved by the use of the advanced ISCAR product. This new ISCAR customer is now reaping the benefits of the use of innovative LOGIQ 4 TURN tooling.

**ISCAR UK Ltd**  
**Tel: 0121 422 8585**  
**Email: david.jones@iscar.co.uk**  
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## BIG KAISER



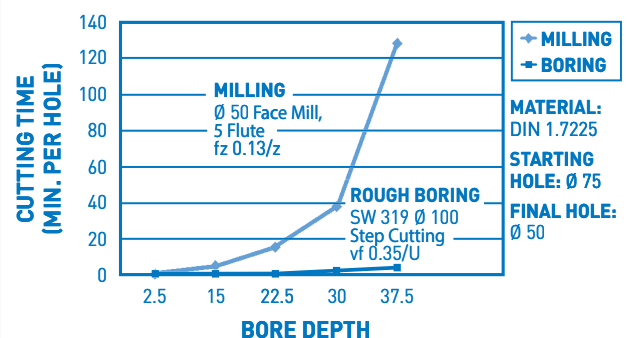
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# Hoffmann Group publishes its 2018/2019 catalogue

Up-to-date and with around 8,000 new products in the range, the Hoffmann Group presents its new 2018/2019 catalogue. The updated reference guide for the metalworking industry includes around 80,000 quality tools, workstations and storage and products for personal protective equipment (PPE). As in previous years, there are many new products offered under the GARANT premium brand. The 2018/2019 catalogue comes into effect on 1st August 2018, in 18 languages. From that date, all the items will also be available from the Hoffmann Group eShop.

Martin Reichenecker, sales and marketing director at Hoffmann SE, says: "Last year we successfully launched our PPE volume on to the market. This year we have further extended our PPE range and also extended the other three volumes of the catalogue with innovative products. For our customers the selection of products is becoming ever more difficult, because the range on offer is continually increasing in all areas. Our pre-selection has therefore been even more rigorous, so as to provide reduced complexity for our customers and make tool selection even easier for them."

The Hoffmann Group has revised its catalogue in all areas and added around 8,000 new items from leading brand manufacturers and the GARANT premium brand. More than 60 percent of new items fall within the area of machining, a core competence of the Hoffmann Group. The innovations in machining include, for instance, new tools for high-performance machining in the 'GARANT Master' product family, such as the GARANT MasterTap and the GARANT MasterTM for thread cutting. Further innovations include the GARANT Xpent vice, available with immediate effect with a centre jaw for clamping two workpieces. Attractive new products from GARANT and other brands are also on offer in the area of hand tools and measuring tools. For instance, GARANT has added a new product family of digital calipers. The area of workstations and storage is ready with the first products from the new GARANT GridLine series, including self-propelled workbenches and workbenches with electric height adjustment.

Martin Reichenecker concludes: "Our customers know that in the Hoffmann catalogue they will find the most innovative products from over 500 leading brands and also the exclusive GARANT brand. As a system partner, it is important that we can provide comprehensive service and advice to our customers. But it's equally important to deliver the goods to the customer on time. Therefore, we are currently investing in a new logistics centre in Nuremberg. That's because we want to be a reliable high-performance system partner not only today but also in future."

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



service competence. To more than 135,000 customers this combination guarantees reliability in supply, quality and productivity, in the tooling sector and also in the workstations and storage sector. Optimum and reliable advice, from individual needs analysis through to the efficient use of products, is assured at all times. Alongside tools for machining, clamping, measuring, grinding and cutting, the portfolio also comprises hand tools, protective work-wear, workstations, and storage and workshop accessories.

**Hoffmann GmbH**  
**Tel: 0870 417 6111**  
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## Sumitomo's WFX-Type Wave Mill expanded

Sumitomo Electric Hardmetal has extended its highly successful WFX-Type Wave Mill screw-locking shoulder milling cutter range using the proven, economic advantageous series of four corner inserts into the WFXH, high feed rate multi-purpose roughing, and the WFXC chamfering-type bodies.

By maintaining the use of existing inserts in the WFX Series, tool management and stock holding of inserts becomes more economic extending use to a wider range of applications. The combination of the existing inserts and new cutter bodies offer high stability and are able to create optimal levels of axial run-out within 0.03 mm on materials.

The original WFX Wave Mill high precision cutters were developed to provide optimised squareness up to 90 degree shoulders. For depths-of-cut up to 10 mm, the cost-efficient four corner insert with the high-performance Sumitomo developed ACE-Coat Super ZX multi-layer PVD coating, in-cut life was some 1.5 times greater than conventional inserts.

This high productivity return is also due to

the precision machined seating in the body, and controlled insert manufacture, to enable high orders of shoulder squareness on the milled component which is also achieved with excellent levels of surface finish.

The extended Wave Mill cutter bodies are available in shell and endmill versions each using four-corner inserts. For high feed rate applications and roughing cycles, WFXH inserts are set at 15 degree cutting edge angles while the WFXC chamfer-type bodies have a 45 degree cutting edge.

The optimised edge strength of the WFX indexable inserts is achieved using a convex shape, whilst a flat between its corners minimises marking of the machined part due to any differences in levels when step cutting using sequential cutting depths. In addition, a wiper insert with 15 degree cutting edge to its single corner is also available in order to achieve even greater surface flatness and finer finishes.

There is a range of chipbreakers, L for low



cutting forces, G for general purpose, H having a strong edge and S with a sharp edge. These can be specified to optimise milling of specific materials and cutting operations as well as the application of the latest Sumitomo multi-layer Super ZX Coat.

There is also a series of seven different insert grades for finishing, medium cutting and heavy duty cutting available.

**Sumitomo Electric Hardmetal Ltd**  
**Tel: 01844 342081**  
**www.sumitomotool.com**

## Rainford Precision introduces high accuracy end mills for toolmakers

Specifically aimed at the toolmaking industry, Rainford Precision has now introduced the new series of HSB-S Unimax ball nose end mills from Union Tool. The new range of small short shank end mills is targeted at manufacturers who demand the utmost in precision, performance, and longevity, when machining intricate features and challenging materials.

The new 2-flute short-shank end mills are ground to an H4 tolerance of 0/-0.004 mm, demonstrating that this product line is the tool of choice for precision machine shops that demand performance levels that are beyond the realms of most tooling vendors. Designed for application with precision machine tools and toolholders such as shrink-fit holders, the HSB-S is offered with an overall length from 35 to 40 mm to minimise tool protrusion and maximise rigidity.

Importantly, a key feature of this range is the  $\pm 0.003$  mm tolerance of the ball nose radius to improve surface finish when machining this is aided by having a +0/-0.004 mm shank tolerance ensuring concentricity of the cutting edges is at its

highest. The HSB-S Unimax is offered with a ball nose radius of R0.1, R0.15, R0.2, R0.3, R0.4, R0.5, R0.75, R1, R1.5 and R2 mm with a length of cut from 0.2 mm to 4 mm.

Designated as a series for machining materials of 40HRC and above; this range delivers uncompromising levels of tool life and performance. This is guaranteed through the innovative HardMax coating technology, negative rake angle geometry and overall precision of the tool geometry. These features combine to provide the ideal balance of tool hardness, heat-resistance and durability. The negative rake reduces as the radius transitions to the periphery and this minimises tool deflection and generates mirror-finish surfaces that far exceed the quality of anything seen before.

As well as offering precision, performance, uncompromising surface finishes and tool life, the HSB-S also delivers flexibility with its ability to effectively machine materials such as carbon, alloy, pre-hardened and hardened steels up to 70HRC.

For manufacturers looking for a long-necked version for reaching difficult to



access surfaces, Rainford Precision can also offer the HSLB-S series. Available with a ball nose radius from R0.1 to R3 mm, the HSLB-S range has a maximum clearance length of 20 mm with an overall length from 35 to 50 mm depending upon the selected tool diameter.

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# FARO's precision and portability aids Weir Minerals

Weir Minerals Europe, part of the Weir Group PLC, is a leader in the provision of mill circuit technology and services and tin slurry handling equipment for abrasive, high wear applications. The company's products are used in the mining, oil and gas and general industrial applications.

Weir Minerals has an established reputation around the globe for its superior quality products. To ensure the company maintains its reputation, Weir Minerals administer a stringent quality regime and make regular investments in the best available quality control equipment. At Weir Minerals' production facility in Lancashire, products are manufactured that can be over 4 metres in diameter. Given the demanding accuracy requirements of the company's Warman® slurry pumps product range, consistently maintaining levels of precision over such large dimensions proved to be time consuming.

The ideal answer to Weir Minerals Europe's large capacity/high accuracy metrology needs was found in a FARO titanium measuring arm with an 8 ft capacity. The use of the precise, yet portable, measuring arm meant that rather than carry out the slow, laborious removal of a large, heavy component from a machine tool with the company's overhead crane, then transporting it to a fixed Coordinate Measuring Machine (CMM) for an in-process measurement routine, the use of the titanium measuring arm meant that accurate



measurements could be made whilst the company's products were still located on the machine tool. Not only did this new method slash inspection times, whilst delivering the required levels of precision, the difficulties associated with disturbing large components' setups, then returning them to the machine tool for further operations, were brought to an end.

The success of Weir Minerals' original FARO arm meant that, as the company introduced even larger products, a second 12 ft capacity FARO quantum measuring arm was soon purchased. To complement the company's FARO tactile probing products, and to provide additional inspection capabilities, Weir Minerals has also invested in non-contact FARO scanning devices. As recent increased levels of production had the potential to place a strain on the company's existing inspection provision, two FARO arms were purchased.

Andrew Horsfall, quality supervisor at Weir Minerals Europe, explains: "Weir Minerals products are used in demanding, abrasive areas such as slurry transportation and mineral processing plants, and includes market leading products such as Warman® and GEHO® pumps, Cavex® hydrocyclones and Linatex® rubber products. Our expertise lies in the delivery of excellent wear resistant engineered products and our products have a reputation for delivering outstanding reliability and longevity. To uphold our hard-won reputation for the quality and long-lasting nature of our products, we oversee a strict quality system, in addition to in-process quality checks being made at each stage of manufacture, on completion each product undergoes a comprehensive final inspection routine.

"Before our use of FARO products,

although our large, fixed CMM had the capacity, and accuracy specification, to enable it to undertake the inspection of all of our products, we were aware of the time being spent in removing large, heavy products from machine tools mid-cycle to allow the necessary in-process dimensional checks to be made. Having searched for a suitably precise, portable means of inspecting large products, while still on our machine tools, we witnessed several system demonstrations. As we were extremely impressed with the FARO titanium measuring arm, we were happy to place an order.



"Following a brief training course, the simplicity of our new measuring arm's controls and the logical nature of FARO's software meant that I soon became proficient in the system's use. I was then able to train my colleagues in the measuring arms operation.

"The use of our first FARO measuring arm was a real game changer, it meant that the need to remove large components from machine tools for in-process inspection, then to replace them for further machining, was completely eliminated. Our new inspection method also removed the problem of interrupting a component's setup in the machine tool, then attempting to return it to the same position.

"The success of our first FARO titanium soon resulted in the purchase of several further FARO arms and also two FARO non-contact laser scanning devices."

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# INSIGHT INTO THE INSIDE INDUSTRIAL CT

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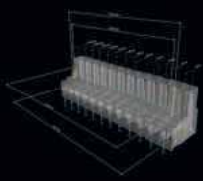


- ✓ Non-destructive CT avoids cutting of samples/parts
- ✓ Powerful 225-450 kV microfocus X-ray source inspects metals, composites, etc
- ✓ Micro-focus detail allows structural analysis of voids, cracks or internal features
- ✓ Dimensional inspection of complex internal geometries
- ✓ Inline CT Automation ready

## Application examples



Connectivity issues in electrical components



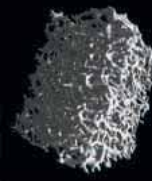
Measuring small internal geometries



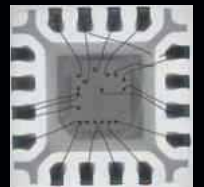
Internal voids or cooling channels in AM parts



Assembly verification of one-off or critical use components



Material analysis (foam)



PCB(A): BGA voids, broken bonds, wire sweep etc



## INSIGHT INTO COMPLEX COMPONENTS WITH MICRON DETAIL

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# See the light with CT

### Nordic Lights uses CT to verify dimensions and check for defects

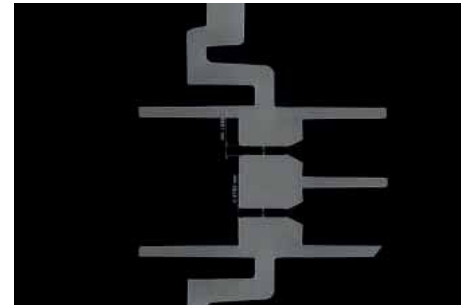
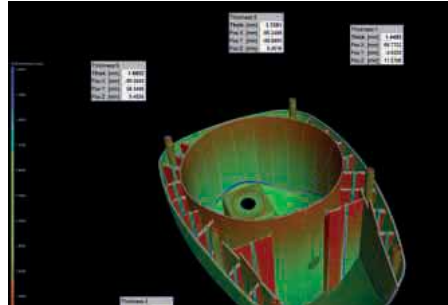
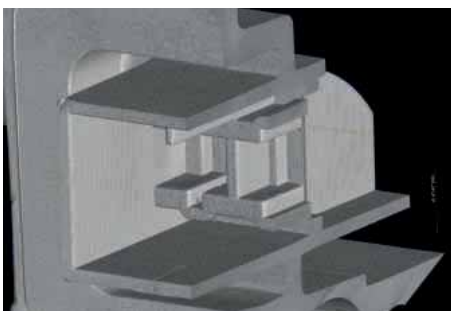
Nordic Lights is a Finnish company based in Pietarsaari and was founded in 1992. It is part of the Herrmans Oy Ab Group and is a manufacturer of premium, high-tech work and driving lights for heavy duty vehicles in extreme conditions. Its products are used throughout the mining, construction, forestry, material handling and agricultural industries, with clientele including Caterpillar, Liebherr, Sandvik, Komatsu and Volvo.

The company has developed to become an expert in lighting technology through its productive collaboration with partners in different branches of the industry.

Continuous strategic investments in the R&D department, laboratories and the latest simulation software keeps Nordic Lights at the forefront of the industry.

Complete assemblies are typically made from aluminium, steel, plastic and glass. The components are manufactured through a range of processes including die-casting, injection moulding and machining. Before passing inspection, all new products undergo extensive testing. These tests include lumen output and light distribution, vibration and shock, dust and humidity, heat and cold exposure, thermal cycling, thermal protection, electromagnetic compatibility, full functionality, abnormal conditions, chemical resistance and usability.

For inspection purposes, Nordic lights previously relied on a white light system. A lot of components with ribs, pins and cylindrical holes are used in production, and the white light system typically has difficulty examining these. Scanning components with narrow or tight features is incredibly difficult when details are too deep for the light to detect. As the white light system is only capable of line-of-sight external surface inspection, internal defects were neglected.



To gain a comprehensive picture of the inside, samples and products were subject to expensive and time-consuming destructive testing.

Another problem with this inspection solution is that it requires parts to be painted and marked with alignment dots. Painting or powder spraying is needed as a part-preparation method for smooth surfaces to avoid reflections in the white light system. This however introduced critical measurement errors on optical surfaces, where precise tolerances are required. Not only did this result in critical errors, but the whole process was slow and time consuming.

A new measurement solution, capable of analysing a variety of materials and both internal and external features with high precision and efficiency was required. The team consulted various suppliers to determine the best solution for its requirements.

The Nikon XT H 225 ST, with reflection and transmission dual-target system, has since been installed at Nordic Lights, for R&D and troubleshooting requirements. It is critical for all components to be approved before they can be used in product assembly. The primary purpose of the CT system is to validate supplier samples and new parts, or modified parts from new moulds.

A secondary purpose for the system is troubleshooting. During the test phase, if there are any failures, complete assemblies can be scanned to identify the root cause without having to open up or destroy the product. For troubleshooting, it has been used to search for air pockets or voids in the silicone glue between the aluminium housing and the lens, that have caused leakage.



A major factor in the decision-making process was the straightforward maintenance of the open tube source. A system with an open tube source makes for lower maintenance costs and vitally, reduced down time. The fast and competent service from Nikon support engineers, was also a critical point in the decision-making process.

The Nikon Metrology CT system represents a significant step up from the previous method used in the R&D department. The white light system offered limited repeatability and low speed, which was a hindrance. The CT system addresses these issues and now makes it possible to scan almost every component before approval. The CT system reveals internal defects including air pockets and voids which is not possible with the white light system.

Now with a non-destructive inspection system, Nordic Lights notes significant time savings, especially in the development phase. Defects can be identified, traced and eliminated before parts pass to production. For supplier submitted samples, new parts or new moulds can be compared to the CAD models before being used in the assembly of complete products.

**Nikon Metrology UK Ltd**  
**Tel: 01332 811349**  
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# Starrett on the road with metrology solutions

By Caitlin Steele, The L.S. Starrett & Co Ltd

Industry 4.0 is on its way, and it's true what they tell us, "you can't stop progress." Driverless technology and AI robotics are taking to the stage, swooping in to solve all our manufacturing problems. What we can be sure of is that the industry, as we know it, will never be the same again. Despite all the exciting movements going on in manufacturing right now, we've been listening to some of our customers concerns over this new age technology business. These are the same concerns that also sparked the recent changes in privacy laws and data protection this year. The way we communicate with each other has already changed so dramatically over recent years that it has become unrecognisable to our former selves. Now, it is clear to us that the challenges businesses face no longer lie in the traditional areas of design and logistics, but in the areas we assumed would never become replaced by a machine.

Having bought my first mobile phone when I was just 13 years old, I am familiar with the challenges of 21st century communication. Back then if you received at least 30 text messages a day, then you knew you could call yourself a flourishing social butterfly. Then things started to change. Not only were you expected to own the latest £600 devices, but you had to be fluent across all communications platforms that those devices provided. Suddenly, thirty text messages a day became, emails, page likes and followers. Communicating was no longer an optional activity but a way of life and the more ways we found to connect with each other, the more disconnected we seem to become.

Recently, we learned that over 70 percent of adults in the UK now own a smart phone and spend on average one full day each week looking at them. With so much unfiltered access to the wider public opinion, we should be living in a world of fluent and constant conversation, we should know everything about everything, understand everyone's opinion and have achieved world peace three times over by now. In fact, the exact opposite has happened. We are flooded with colossal surges of data, every second of every day, that aim to alter our perceptions. The more sophisticated these communicative



technologies become the more blended the content becomes.

In 60 years of UK manufacturing, Starrett has built its trust on the simple promise to deliver metrology solutions. We have prided ourselves on our ability to do this at top industry standards while also maintaining the value of simplicity in a complex industry. Communication is key to establishing this. With Industry 4.0 looming in our horizon, and with it a whole army of new digitalised communications platforms, our focus becomes, how can we ensure that simplicity remains?

The answer is again, simple. Starrett are pulling back on industry 4.0. Not on the products and not on the progress, but on the way we chose to communicate. This year, we are introducing "Starrett On The Road with Metrology Solutions", a new project aimed at cutting through the confusion and reclaiming our voices in an automated world. By bringing the solutions directly to you, along with some of our trained experts to provide demonstration and training, we are creating the opportunity to meet the minds behind the

machines. Getting away from the flatness of a computer screen and re-engaging with the human side of business. Bringing you the chance to experiment on products for yourself, ask any questions you need and then get the answers straight from the horse's mouth.

We are creating a level field between business and consumer. By stepping away from the screens that seem to control our actions and seeing the industry work magnificently with your own eyes. To embrace these exciting new times and maintain the simple skills that helped us get here. Industry 4.0 promises to be the star of the show in the years to come, but it still remains that it is people and communication that controls the future, not the machines.

**The L.S. Starrett Company Ltd**

**Tel: 01835 863 501**

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# Mitutoyo speed increases Bushell & Meadows production

Bushell and Meadows Ltd is a renowned subcontract manufacturer of high quality, precision engineering components. The business has invested heavily in state-of-the-art, high-speed CNC machine tools and serves a range of demanding markets including the medical, aerospace and defence sectors.

Bushell and Meadows specialise in the production of complex components from a variety of materials including titanium, plastics, aluminium, stainless steel and other special alloys. The company is able to undertake the development of prototypes and carry out production runs ranging from small batches to quantities of over a thousand. A second speciality is the manufacture of high grade surgical steel blades for oscillating, reciprocating and sagittal bone saw tools.

Having achieved EN ISO 9001:2008 and EN ISO 13485 Quality Management Accreditation, Bushell and Meadows is committed to safeguarding its reputation for the quality of its output and for the services it provides. To enable the businesses quality control function to keep pace with ever increasing levels of production, regular investments are made in advanced inspection equipment. The recent installation of several highly productive machine tools, including horizontal machining centres with pallet loading,



prompted the purchase of an advanced CMM (Coordinate Measuring Machine) and an optical profile projector from Mitutoyo UK.

Paul Vedmore, Bushell and Meadows production manager, explains: "We have a wide range of CNC milling capabilities provided by our Mazak, Matsuura, Haas and Star sliding head machines. Also, to help satisfy growing demand from our customers, we have recently added three new Mazak Integrex machines.

"Each job that leaves our company has been through numerous quality control processes, for example first-off assessments, in-process checks and thorough final inspection routines.

"As our increased levels of production had the potential to place a strain on our inspection capability, and to help ensure that we were able maintain our high-quality standards, we recently installed a high-speed, high-accuracy Mitutoyo CRYSTA-APEX S 574 CNC CMM to complement the Mitutoyo CRYSTA-APEX S776 that we already have. We also purchased a multipurpose Mitutoyo PJ-A3000 profile projector for non-contact measuring inspection work.

"Now fully operational, our new Mitutoyo CMM and profile projector has significantly expanded our inspection capabilities and has increased our busy quality department capacity, enabling it to keep pace with our increased levels of production.

"As non-contact inspection methods are the most effective means of measurement for a large number of our components, our new Mitutoyo PJ-A3000 profile projector has proven to be a real 'work-horse' in our inspection department. Our operators find the PJ-A3000's digital XY counter easy-to-read and it helps that, when required, they are able to precisely measure components angles through the use of its digital readout protractor.

"Our new Mitutoyo CRYSTA-APEX S 574 CNC CMM has a capacity of - X-700 mm, Y-700 mm, Z-600 mm, which is ideal for the size of components we manufacture. Given our quality ethos, and also our need for high-speed inspection, this particular Mitutoyo CMM proved ideal for our needs."



Mitutoyo offers a wide variety of CMM's in a range of sizes and accuracy classes that cover practically all precision 3D measuring applications. A wide range of contact and non-contact probes enables numerous kinds of measurement to be performed, whilst Mitutoyo's analysis software is able to interpret measurement results in a timely manner.

The CRYSTA-APEX S 574 variant, as recently installed at Bushell and Meadows, is a popular model of Mitutoyo's CRYSTA-APEX S Series of CMMs. This CMM series represent a range of high performance, cost-effective CMMs that are designed and constructed according to Mitutoyo's extensive experience in CNC CMM technology.

Manufactured from lightweight materials, and featuring an innovative machine structure, CRYSTA-APEX S CMMs deliver high motion stability, impressive accuracy and affordability. As is the case with Mitutoyo's conventional CMMs, various structures are employed in the CRYSTA-Apex S in order to provide high levels of rigidity, while the availability of compatible vision and scanning probe technologies delivers a range of flexible and effective measurement capabilities. In addition to use in dedicated quality departments, the CRYSTA-APEX S Series' temperature compensation function allows users to perform accurate measurement routines even when the machines are located on the shop floor.

**Mitutoyo (UK) Ltd**  
**Tel: 01264 353123**  
**Email: philip.fisher@mitutoyo.co.uk**  
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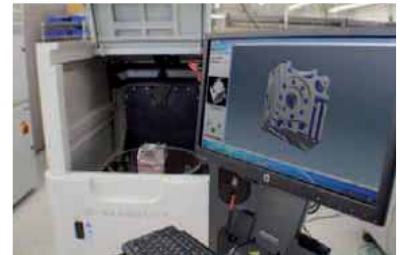


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# Aberlink provides shop-floor accuracy

Nasmyth Bulwell specialises in the manufacture of precision parts, kits, airframe assemblies and sub-assemblies for the global aerospace and allied industries. The company's advanced manufacturing facility in Pinxton, Nottinghamshire is equipped with a range of cutting-edge technologies that helps to deliver integrated precision manufacturing solutions and a comprehensive supply chain infrastructure.

Nasmyth Bulwell utilises a wide range of advanced CNC machine tools to produce fine-tolerance, quality-assured components in steel, aluminium, nimonics, super alloys and other materials. In addition to its advanced machining provision, the company offers a further comprehensive range of services including waterjet cutting, heat treatment, anodising, non-destructive testing and paint and plasma spraying.

The company's strict quality management system has been developed to encompass all aerospace industry standards and a wide range of approvals. To help ensure the manufacture of premium quality components, and to comply with the most stringent of traceability standards, the company's output is subject to a variety of industry leading inspection and testing procedures.

Nasmyth Bulwell makes use of a range of advanced inspection aids, including six large capacity coordinate measuring machines, located in an environmentally controlled inspection facility. In response to 'cost-down' pressures, and to complement the work of the company's existing CMMs, a search was recently made for a robust, accurate CMM that could deliver the required standards of precision and speed of operation on the company's shop-floor. A successful demonstration convinced Nasmyth Bulwell quality manager, Jonathan Walsh that the advanced Xtreme CNC CMM from Aberlink satisfied all the company's demanding criteria.

Jonathan Walsh explains: "As we operate in what is a fiercely competitive industry, in addition to ensuring that we deliver premium quality parts, we are constantly exploring more efficient ways of both manufacturing and inspecting our output. Our system improvements, and investments in innovative technology, together with observing our strict quality standards, have enabled Nasmyth Bulwell to secure significant contracts. For instance, we have recently been awarded contracts worth more than £60 m from a major aerospace OEM. These long-term agreements are for the supply of both legacy and new, complex components for engines which are fitted to the latest wide body aircraft.

"In keeping with Nasmyth Bulwell's philosophy of constantly upgrading our systems, and adopting industry leading manufacturing and inspection methodologies, we recently decided to instigate a precise shop-floor CMM provision. Having evaluated several shop-floor CMMs against our demanding list of requirements, an impressive demonstration of Aberlink's Xtreme CNC CMM, together with Aberlink's excellent reputation, convinced me that the Xtreme was the ideal machine for our needs.

"As our new Xtreme CMM was due to operate within a non-temperature controlled, production environment, even though our new CMM had a traceable calibration certificate and despite Aberlink providing assurances related to the Xtreme's accuracy, we decided to verify its performance in-house. Having measured several complex, tight-tolerance components on our new Aberlink machine, then on our inspection department CMMs, we were



happy that the readings corresponded. The accuracy, CNC nature and speed of our new Aberlink CMM means that it is able to perform comprehensive inspection routines on manufactured components within the cycle time of the machine tool it is located next to. Now, rather than our skilled machine operators taking a first-off part to our busy inspection department for pass-off and experiencing delays waiting for a CMM to complete its current task, they are able to quickly confirm components' dimensions before commencing full production.

"In addition to taking the strain off our busy inspection department, the efficiencies we have realised through our use of our new Aberlink shop-floor CMM mean that we plan to purchase further Aberlink Xtreme models in the future."

Aberlink's inexpensive CNC Xtreme requires no compressed air and boasts the shortest learning curve of any equivalent system; therefore, an inexperienced operator is normally able to become competent in the Xtreme's use in just a single day, making the robust CMM the ideal 'plug and go' shop-floor measuring solution. In addition, the Xtreme's integral temperature control function ensures that accuracy levels are maintained even when the surrounding ambient temperature is not controlled.

Ensuring greater user productivity and profitability, the Xtreme utilises Aberlink's renowned 3D software.

**Aberlink**  
**Tel: 01453 884461**  
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# 5-axis technology enables measurement without compromise

Measurement is an essential part of manufacturing, used to control processes and verify products. However, measurement time is often viewed as non-productive, causing unwanted bottlenecks and putting pressure on manufacturers' operating margins.

Renishaw's 5-axis measurement product range for Coordinate Measuring Machines (CMMs) claims to be one of the biggest step-changes in measurement capability ever introduced in industrial metrology and goes a long way to overcoming these challenges.

The need to retain accuracy has historically compromised the ultimate speed of the measuring process due to the characteristics of a CMM's structure. The non linear motion of a Cartesian CMM induces accelerations and decelerations that twist and deflect the machine structure, and result in measurement errors that increase with speed and acceleration.

CMM manufacturers work relentlessly on software and machine improvements to overcome those limitations, but ultimately the physical nature of the CMM structure constrains further improvement.

REVO® 5-axis systems approach this challenge from an entirely different perspective, minimising CMM accelerations whilst moving the stylus very rapidly over the component surface through the simultaneous control of the three machine and two probe head axes (X, Y, Z and A, B).

Additionally, the REVO system offers five different probe families, each specifically designed to maximise the advantages of 5-axis motion and infinite positioning. The probes are automatically interchangeable and include tactile scanning, touch-trigger, surface finish and non-contact vision probes. All are used within a common coordinate reference frame and provide the choice of an optimum tool to measure multiple features all on a single CMM platform.

Automotive is one sector benefitting from this technology with manufacturers finding unparalleled advantages in the expanded SFP2 surface finish measurement product range, offering operator independent data collection and the opportunity to eliminate dedicated surface finish equipment. By



integrating automated roughness measurement, and drastically reducing the number of probe styli required to measure complex parts, REVO systems have a direct impact on powertrain manufacturing effectiveness.

Renishaw has always been an innovation leader in industrial metrology. The company's first product, the touch-trigger probe, led to a revolution in three-dimensional coordinate measurement. Ever since, a strong commitment to research and development has brought to market products that have been milestones in industrial metrology. The REVO 5-axis measurement system is leading a new revolution in quality control, enabling manufacturers to stay competitive, push the boundaries of their production processes and improve the cost effectiveness of their manufacturing.

For more information on the REVO-2, visit [www.renishaw.com/en/revo-5-axis-measurement-system--10438](http://www.renishaw.com/en/revo-5-axis-measurement-system--10438).

UK-based Renishaw is a leading engineering technologies company, supplying products used for applications as diverse as jet engine and wind turbine manufacture, through to dentistry and brain surgery. It has over 4,000 employees located in the 35 countries where it has wholly owned subsidiary operations.

For the year ending June 2017, Renishaw



recorded sales of £536.8 million of which 95 percent was due to exports. The company's largest markets are China, the USA, Japan and Germany.

Throughout its history Renishaw has made a significant commitment to research and development, with historically between 14 and 18 percent of annual sales invested in R&D and engineering. The majority of this R&D and manufacturing of the company's products is carried out in the UK.

The company's success has been recognised with numerous international awards, including eighteen Queen's Awards recognising achievements in technology, export and innovation.

**Renishaw plc**  
**Tel: 01453 524524**  
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# No stone unturned in pursuit of excellence

As part of its quest for continued growth, excellence and product diversification, CMS Cepcor of Coalville has recently invested in the latest Creaform HandySCAN3D from Measurement Solutions.

CMS Cepcor Ltd is Europe's largest aftermarket manufacturer and supplier of premium quality stone crusher, screen and asphalt plant spare parts. The company provides crusher products and services globally to the mining, quarrying, demolition and recycling industries, exporting to over 100 countries.

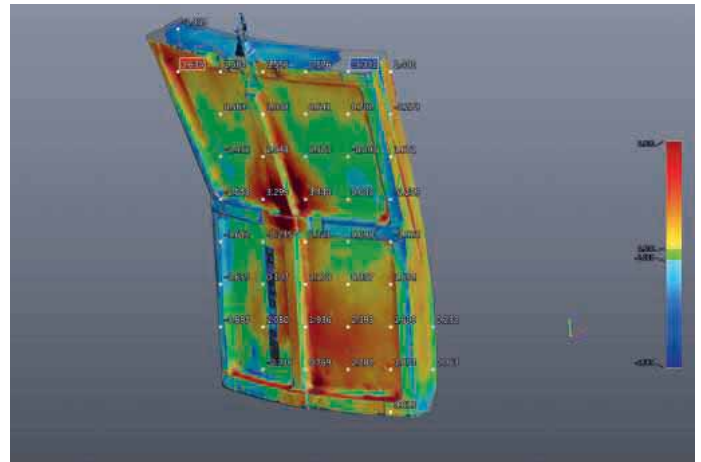
To maintain its premium status, operations director Chris Sydenham is constantly looking at new technologies and capabilities to drive improved efficiencies, customer satisfaction and product diversification. This has been exemplified in recent years with £7 million invested in modern UK manufacturing facilities which includes CNC, milling, turning, boring, slotting, grinding, drilling, welding, coordinate measuring and materials testing.

The key to aftermarket success is response time and product availability, two factors which were significant during its decision-making process. As a pioneer for new technology and research and development, CMS Cepcor has made significant investments in three portable measuring and scanning arms during the last decade. However, the portability and scanning capability in particular resulted in a need to assess new complementary technologies to increase measurement efficiency and usability.

Chris Sydenham says: "The Measurement Solutions team were able to visit our facility and demonstrate a device which is truly portable. Although we design and manufacture in the UK, having the ability to take the HandySCAN3D abroad is a major advantage, as the whole system is transported in a carrying case no larger than aircraft hand luggage. This gives us a whole new capability of scanning on-site, with the ability to send the data back to the UK to begin the reverse engineering or inspection processes before our engineer has even boarded the plane back home."

During the hardware selection review, a dedicated team consisting of design engineers, CAD/CAM programmers and quality assurance leaders tested various handheld and next generation portable arm systems.

Design engineer, Tom Quinzi says: "The handheld market, in particular, offers white light solutions which have their appeal due to low cost. However, during testing, we very quickly realised that such devices are low cost for a reason, as we revealed lost capability



on accuracy and the ability to scan a multitude of materials such as shiny or black components.

"In comparison, while the latest generation of portable arms have indeed improved on accuracy, there are some serious limitations in terms of portability, with heavy tripod stands or magnetic mounting required, and slow device move procedures on larger objects. Compared to a truly hand-held device, it was clear that a portable arm does not give us any additional capability and therefore no increased performance gains. In addition, due to the scale of the components CMS manufacture, the large field of view and scanning speeds generated by the HandySCAN3D's 14 laser lines far surpassed any other system we considered."

As an experienced user of portable scanning arms, Tom Quinzi was also able to further assess the software workflows offered with Measurement Solutions:

"The VXelements suite of products recommended by Measurement Solutions, and supplied with the HandySCAN3D, has immediately removed our previous pains. The alignment process, when utilising multiple point cloud meshes, has completely disappeared since introducing the HandySCAN3D, as we are able to physically move the component mid-way through a scan and continue without any re-alignment necessary. This has resulted in massive time savings over previous arm methods, while the simple workflow in VXelements enables multiple scans to be aligned within seconds if scanning assemblies."

CMS Cepcor has a complete CAD workflow integrated within the business based on the Autodesk Inventor platform. Although laser scanning capability has existed in the business with the portable arms, the software workflow has hindered an effective introduction of the use of point cloud data. However, since introducing the VXmodel software, a module of VXelements, this has changed completely. Using VXmodel, the business now has the ability to finalise scan data through a suite of easy-to-use mesh preparation tools, concluding with a direct 'live transfer' mode which seamlessly moves geometric features, sections cuts and surfaces directly into the company's existing CAD software.



**Measurement Solutions Ltd**

**Tel: 01733 325252**

**Email: [sales@measurement-solutions.co.uk](mailto:sales@measurement-solutions.co.uk)**

**[www.measurement-solutions.co.uk](http://www.measurement-solutions.co.uk)**



# Eliminate the need for fixed gauges

## The ZEISS DuraMax Production CMM

Operating in a rough production environment? That's no match for the ZEISS DuraMax. This system simply brushes off temperature fluctuations, dust, dirt and rough handling throughout the day. In fact, that's one of the main reasons why David Torr, head of metrology at Reliance Precision, opted for the ZEISS DuraMax shopfloor system.

As he explains: "We chose this machine for its small footprint. It's a 500 mm cubed system that is capable of withstanding the shop floor environment. Although we are temperature controlled throughout Reliance Precision, we needed a rugged machine that was going to last on the shop floor."

The ZEISS DuraMax system offers everything you need to get up and running with precise measurement, low running costs and no need for an air supply. This is supported by ZEISS service, support and training. What's more, it includes user-friendly Calypso CNC inspection and analysis software, PiWeb Reporter Plus and 1 CAD Interface. Equipped with the VAST

XXT scanning sensor, the ZEISS DuraMax can even be used to capture contours and freeform surfaces.

David Torr says: "The machine can even be moved around on a pallet truck if so desired. We used to have a centralised inspection area where operators had to take their components, but now we are placing the metrology machines on the shop floor right next to the machine tools. This reduces travel time and it enables the operator to view the CMM results whilst they are operating a machine tool. This method has created a lot of efficiency savings for us."

With Reliance Precision about to have its sixth DuraMax installed, David Torr explains how the accuracy of the system has been key for them: "The machines are specified to 2.4 microns for volumetric accuracy in accordance with ISO specifications. As we work within a small area of that work envelope, we can obtain repeatability in the realms of one micron."



ZEISS is currently running a promotion on the DuraMax system, for a limited time only. Customers who order by 30th September 2018 will receive a 15 percent cost saving, valid for leasing or outright purchases. Fast delivery of systems is available if required.

To find out more about the offer and for full terms and conditions, visit:

[www.zeiss.co.uk/duramax-offer](http://www.zeiss.co.uk/duramax-offer)

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# Moore & Wright calipers monitor growth

Keepers at Paignton Zoo in Devon are using Moore & Wright calipers, supplied by the Bowers Group, to measure the growth and development of Critically Endangered spider tortoises. As the first zoo in the UK to successfully breed the spider tortoise, *Pyxis arachnoides*, Paignton Zoo are in the process of rearing the youngster, before sending the reptile on to another zoo to further extend the breeding programme.

It is very important to closely monitor the spider tortoise whilst it is reared. Measurements taken from the width of the spider tortoise's shell are a good indicator of healthy growth and development. Precise and accurate measurements are a must, as well as ensuring that the measurement process causes no unnecessary disruption to the reptile. Due to the size of the tortoise, a method was needed that would very precisely determine measurements down to fractions of a millimetre.

Bowers Group supplied Paignton Zoo with a Moore & Wright plastic dial caliper to accurately measure the spider tortoises, ensuring the health and development of the reptile is closely monitored. The dial calipers are perfect for the accurate measurements required by the zoo keepers in charge of the tortoise's care, boasting an accuracy  $\pm 0.1\text{mm} / \pm 0.004''$  accuracy. Manufactured from glass reinforced nylon material, the Moore & Wright plastic dial calipers are highly durable, as well as precise, accurate and perfect for repeatable measurement.

Dr Katy Upton, senior keeper for lower vertebrates and invertebrates department at Paignton Zoo, says: "We use the Moore & Wright plastic dial calipers because we like the ease of reading the measurement from them. They are so simple and straightforward that it's easy for lots of different people to use them, and still get the same result. They're so simple to read.



The calipers give us very precise measurements which, for such a small animal, is essential for monitoring the healthy growth and development of a species that is classed as critically endangered."

The spider tortoise is not only one of the world's smallest tortoises, it's also on the brink of extinction. Found around the south western coast of Madagascar, the adults are only around six inches long, and take their name from the spider's web patterns on the shell.

Little is known about the life cycle of this tortoise, although it's thought to live for up to 70 years. One thing that is well understood is the threat of extinction.

One of the critical elements is a period of brumation; a state of dormancy during a cooler time of the year. Mating tends to

occur after this period. One single egg was laid at the zoo, which is normal for this species, and hatched after roughly 180 days of incubation. The egg then needed a cooling period to ensure a delay in development and was then incubated by staff in a special custom-made incubator, with progress monitored carefully and daily records kept.

The egg hatched on Wednesday 25th April, making Paignton Zoo the first successful UK zoo to breed the spider tortoise.

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## FLIR ONE Pro helps to monitor the condition of power supplies and distribution boards

A lot of preparation goes into each Aston Martin Red Bull race, both on the track and behind the scenes at the factory. It's up to the IT team to ensure that race data can be shared between the race team and the factory from anywhere in the world. That is why it is so important that the data centre at the Milton Keynes headquarters is in peak condition 24/7 year-round. To keep an eye on things, the IT team relies on the thermal imaging capabilities of the FLIR ONE Pro.

It's obvious that the skills of a race car driver are a major part of the competitive edge of Formula One. But what goes on behind the scenes at the race track and the factory is just as, if not more, important. They test aerodynamics in the wind tunnel, monitor various sensors on the car, and run virtual simulations and analytics to make sure the car will perform at its best. There is a lot of data to keep track of, and all of it needs to be stored and available for instant access wherever the team is travelling during the race season.

Aston Martin Red Bull Racing has about 700 employees. During a race weekend, a group of about 60 employees will travel to the race. This doesn't mean the others will have the weekend off. A team of engineers and mechanics must work out of the factory during the race weekend to offer remote support. Gary French, the data centre manager for Aston Martin Red Bull Racing, is responsible for keeping the data centre operational 24/7. It's his job to ensure that everyone involved with the race can stay connected to all vital data.

Since 2014, FLIR Systems, Inc. has been an Innovation Partner with Aston Martin Red Bull Racing. Initially, FLIR supported the team by gathering temperature data from the race cars, but the collaboration quickly expanded to other areas. The team uses FLIR thermal cameras and measurement equipment for other company assets, and



for thermal management of the wind tunnel. It also uses FLIR's end-to-end security solutions using a combination of thermal and visible security cameras to monitor both inside and outside of their factory buildings. The partnership has proven to be very fruitful.

**FLIR Systems UK**  
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## Swift-Check keeps an eye on CMM accuracy

Hexagon Manufacturing Intelligence has launched the Swift-Check artefact which is designed to verify a CMM's accuracy in between an annual service and calibrations.

The compact equipment is provided with pre-written PC-DMIS or Quindos software measurement routines, and options, to perform length bar, ring gauge, sphere and wrist checks.

Hexagon says the Swift-Check artefact can be used on any bridge-style CMM that uses an indexing wrist with either a touch trigger or analogue (scanning) probe.

Gary Brice, Hexagon Manufacturing Intelligence's business manager, says: "Our best practice advice is to routinely check a CMM's performance so that unseen system measurement inaccuracy errors can be captured early.

"Swift-Check ensures manufacturers can avoid a potential high cost risk downstream in production or assembly by being pro-active outside of scheduled ISO service and calibration interventions."

More details about the artefact, including an exclusive launch offer, are available from

the UK sales team on 0870 446 2667 or email enquiry.uk@hexagon.com.

Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting, the collection, analysis and active use of measurement data gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service centres, production facilities and commercial operations across five continents, we are shaping smart change in manufacturing to build a world where quality drives productivity.

Its technology enables manufacturers to take control of quality at all the key stages of their process. Through an unparalleled portfolio of digital manufacturing technologies spanning CAE solutions for design and engineering, CAD CAM and



complementary software for production applications, metrology hardware and software solutions, as well as data management and analytics tools, we empower technology users throughout the process with deep and actionable insight into product quality, ensuring that quality drives productivity.

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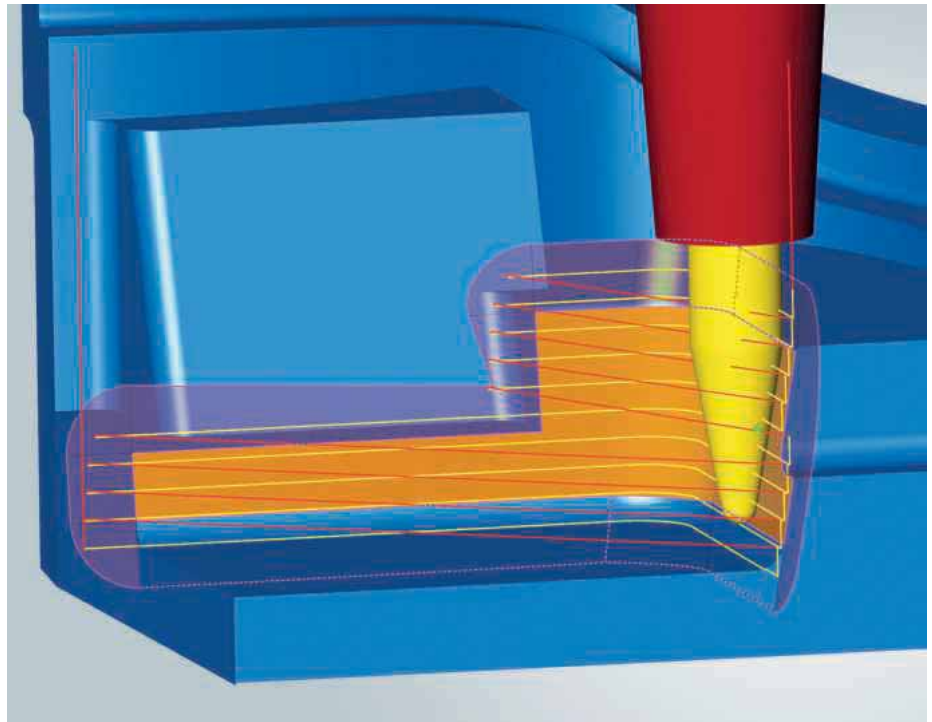
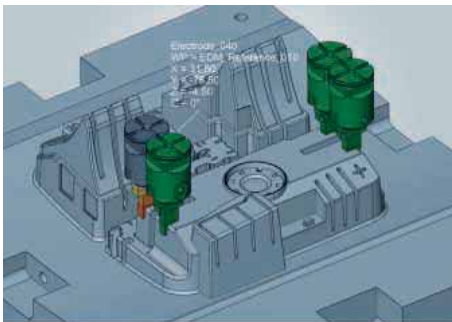
# OPEN MIND releases hyperMILL 2018.2

## Optimised machining begins in the software

OPEN MIND Technologies AG has now introduced Version 2018.2 of its hyperMILL® CAD/CAM suite. In this new release, numerous features, such as drill hole and pocket recognition as well as 3D-optimised roughing, have been further improved. The most important additions are to be found in the CAD section: hyperCAD®-S. This CAD software, which is specifically designed for CAM programming, provides working solutions to many familiar challenges posed by meshes, faces and volumes, enabling the creation of highly precise components and tools. The data is prepared for subsequent NC programming independently of the original CAD system.

One important new feature, introduced in the previous version, has been improved even further in hyperMILL2018.2: the electrode module, which automatically derives electrodes from the faces to be die-sunk within the component geometry. With the 'virtual electrode' function, copies of an electrode that has already been created can now be generated in various different positions. These are checked for collisions and can be assigned the technology values of the master electrode or new technology values. During electrode milling, these values are processed accordingly. The reference system and eroding position for each copy are included in the report.

Two new functions have now been added to the 3D Z-level shape finishing strategy to reduce programming times and improve milling results. The automatic face extension function can be applied during



programming to extend the selected milling surfaces. This CAD-for-CAM feature eliminates the need to modify the milling surfaces in the CAD system beforehand. The new tool types feature allows barrel cutters to be applied to the 3D Z-level shape finishing strategy as a standard tool. Furthermore, this new addition supports tangential and conical barrel tools.

### Easier analysis

One of the new functions in hyperCAD-S makes it possible to measure the distances between two shapes. This function can be applied to face models, solids, meshes or stock. This allows a face created using the 'global fitting' function to be compared with the original face. Moreover, casting allowances can be reviewed very quickly. The frequently-used 'unwrap' command has now had a 'radial' mode added. This allows radially aligned curves or texts on rotational solids to be unwrapped with a constant radial length, which is very useful for engraving and tire labelling.

For easy changes to milling boundaries and turning contours, hyperMILL 2018.2 offers a 'V sketch' command. This is used to assign geometric constraints to 2D contours. When individual contours are changed, the sketch is automatically updated using their dependencies. The

values of the V sketches are edited using dimensional constraints and the parameter list.

OPEN MIND is one of the world's most sought-after developers of powerful CAM solutions for machine and controller independent programming.

The company develops optimised CAM solutions that include a high number of innovative features not available elsewhere to deliver significantly higher performance in both programming and machining. Strategies such as 2.5D, 3D as well as 5-axis milling/mill turning, and machining operations like HSC and HPC, are efficiently built into the hyperMILL CAM system. hyperMILL provides the maximum possible benefits to customers thanks to its full compatibility with all current CAD solutions and extensive programming automation.

Today, OPEN MIND stands for a fully integrated product concept with solutions for automated programming, optimised processes and efficient manufacturing.

**OPEN MIND Technologies**

**Tel: 01869 290003**

**Email: [adrian.smith@openmind-tech.com](mailto:adrian.smith@openmind-tech.com)**

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## CGTech announces VERICUT user exchange events

Each year CGTech hosts numerous VERICUT User Exchange (VUE) meetings around the world for its customers and partners. In 2017, more than 1,600 VERICUT users attended over 45 VUE events in 15 countries. This year CGTech Ltd. has announced 3 UK VUE events to take place throughout September and October.

The first event will be held on 19th September at the Advanced Forming Research Centre, Renfrewshire. A further TWO events will then take place at Moyola Precision Engineering, Ireland on the 26th September, and Williams FI, Oxfordshire on the 2nd October.

At this year's events CGTech will be celebrating three decades of innovation and consistent growth, as 2018 marks the company's 30-year anniversary. Attendees will learn about new software



features, tips for improving manufacturing efficiency and optimisation, and will have the opportunity to meet with company staff and influence the future direction of the software.

Tony Shrewsbury, managing director of CGTech Ltd, says: "VERICUT development is driven by our customers' needs, and we always encourage input from users and partners. Our VERICUT user meetings are not only an opportunity for us to present the latest VERICUT enhancements and features, but they also help us to gather valuable customer feedback for future development."

To register to attend visit <https://www.cgtech.co.uk/about/vue>

CGTech's VERICUT software is the standard for CNC simulation, verification, optimisation, analysis, and additive manufacturing. CGTech also offers programming and simulation software for composites automated fibre-placement, tape-laying, and drilling/fastening CNC machines. VERICUT software is used by companies of different sizes in all industries. Established in 1988, and headquartered in Irvine, California; CGTech has an extensive network of offices and resellers throughout the world

CGTech has partnerships with all major CAD/CAM companies. As a result, there is a VERICUT interface to all major CAM systems. CGTech understands the processes surrounding VERICUT and knows how to make it fit smoothly into customers methods.

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# Edgecam halves Hewland Fork cycle time and slashes tooling costs

A market-leader in gearbox and transmission systems for the motorsport industry is branching out into electric vehicle transmissions and says the company has benefitted with a new manager driving its Edgecam software use up a gear.

Dominic Prinsloo, production engineering manager at Hewland Engineering, works closely with the design team to ensure that all components can be accurately produced through their manufacturing cells.

Hewland has a long history of being the "go-to" company to provide racing gearboxes for vehicles in competitions such as Formula One, LeMans GT, WRC Rally, Open-wheel formula, and Touring Cars, along with high performance sports cars that are equally at home on the road or track. It also produces transmission systems for Formula E electric cars and are now working on a number of projects for electric road cars.

Its core business comprises gear components, including the box, gears and layshafts in fact everything that makes up the entire transmission system. Around 95 percent of the parts are programmed through Edgecam, and almost all are complex, with tight tolerances of between five and ten microns.

Since joining the company in September 2017, Dominic Prinsloo has introduced new ways of working with Edgecam as he



explains: "Hewland has used Edgecam for many years, but weren't utilising it to its full potential." Implementing his methods has led to astonishing results in reducing time and tooling costs.

On a gearbox selector fork, for example, the cycle time was slashed from one hour five minutes down to just 38 minutes, and when tooling costs were also taken into consideration, the savings on that component were "considerable." With a larger fork, his methods with Edgecam saved around half an hour on each individual item. Forecasts show that over a 12-month period the Edgecam changes will also lead to considerable savings on every type of gearbox fork they manufacture.

Dominic Prinsloo says: "It all means we can offer far more competitive prices to our customers."

Those changes include bringing in solid models for programming and generating the features from the model. He continues: "We also use profile features, either generated from the Features Find function, or generated manually. When I came to the company the system was to input the values manually, which was time-consuming and prone to error. Now, the code is generated by associating the toolpaths to the features, so whenever the component is upgraded to the next version, and the model manipulated such as a particular diameter being changed from 32 mm to 45 mm, we just regenerate the feature and the toolpath changes automatically."

However, he says the biggest

game-changer was introducing Edgecam's powerful Waveform roughing strategy to Hewland, both for its milling and turning cells.

"It's now used for all our face grooves, groove turning, and full rad inserts, which has reduced cycle times dramatically."

Previously, when milling its range of gear selector forks, a high feed method was used, with multiple face cutters for one component.

"Those step cutters only lasted for three parts before having to be replaced. He changed the manufacturing process to incorporate Waveform, machining 2.8 metres a minute at 4,200 rpm with a ten percent stepover, which has reduced the number of tools required to cut the component.

"We've reduced the cycle time by 20 minutes on stage one machining, and eight and a half minutes on stage two machining, which means we've saved around half an hour on each fork. And we cut around 23 billets per carbide, instead of three."

Many of Hewland's shopfloor workers were a little wary of Edgecam's Waveform strategy at first, worrying that the ramped-up feeds and speeds would break the cutting tools.

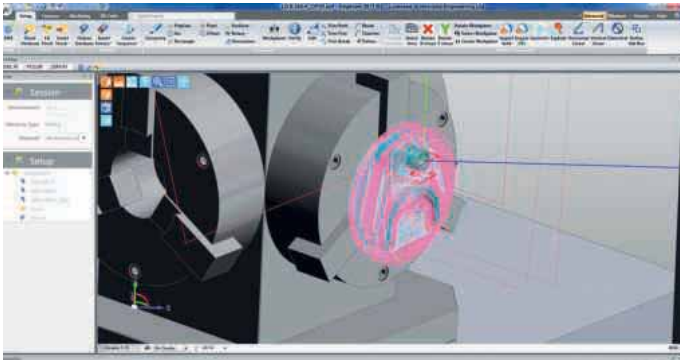
"They'd never seen anything like it. I introduced it slowly, starting with a low revolution, then gradually increased it, until we got to a ten percent stepover, and 2.2 metre feed. That was on EN 36 case hardening steel, so the team very quickly realised exactly what Waveform could do. I



know we can push the machine even more, but this is perfect for our needs. It means the operator can leave the machine running while he goes on to work on another one."

Those same operators now want Waveform to be the default machining strategy.

Dominic Prinsloo says: "We have what we call legacy components, that were originally programmed a long time ago. The shopfloor are asking us to change the programming to Waveform, telling us they find it more reliable, reduces load on the spindle and wear on the tool."



He says another Edgcam benefit is its ease-of-use. "We load the STEP file, and if it's not a raw casting we generate stock through Edgcam's stock library. Then we load a chuck if it's turning component, or vice if it's a turning part.

After that, comes what he calls the real power behind Edgcam, generating the features on the model before they start the programming sequence; loading the machine, and generating the toolkit, which in turn creates the sheet that they use as their live job report.

"We have everything within Edgcam; the stock, the model, chuck, machine, and toolkit. We simply couldn't run our shop without it."

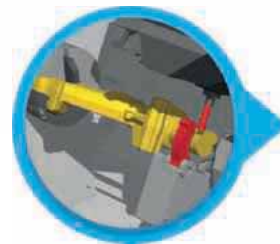
He predicts that Edgcam is going to be even more vital in the future, for prototyping new gear components for electric vehicles. Design engineer Ashley Craig is currently working on a number of transmission systems for that growing market.

Ashley Craig concludes: "I liaise closely with Dominic to ensure that the finished 3D model can be accurately machined. It gives me total confidence that my designs will be faithfully translated into the finished part and ensures that Hewland continues to compete at the top level in terms of the gears and transmissions that we produce. Thanks to Edgcam, we can give our customers competitive prices because it keeps both development and manufacturing costs to a minimum."

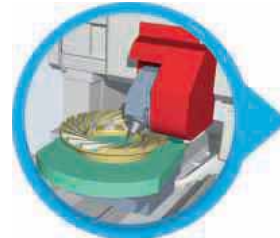
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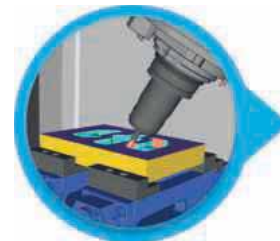
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# ORDERFOX.com launches a free global machinery exchange

ORDERFOX.com has listened to its members and has developed a new free-to-use feature that will surely expand the reach of the "Internet of the CNC Industry" and provide added value to all platform users. ORDERFOX.com members can now access the new machinery exchange feature, where they can easily research, advertise, or even extend an offer to buy any available CNC metal or woodworking machines directly, and all for free.

ORDERFOX.com is the Internet of the CNC industry, offering free access to opportunity, while providing a source where new production partners can be found, and new industry contacts can be made. With the intelligent filter functions, connecting buyers with suitable CNC manufacturers in the metal or woodworking industries both locally and globally, CNC orders can easily and efficiently be placed and fulfilled within the platform on a regular basis. In addition, registered members can find the latest industry news within the knowledge & trends section, and never miss an event again thanks to the global trade show and event calendar. With the free machinery exchange being the latest enhancement to the ORDERFOX.com platform, not only is it an important new feature, but it provides an additional benefit to members from the buy, sell and related industry sectors, proving that there is an even greater reason to integrate ORDERFOX.com into daily workflow.

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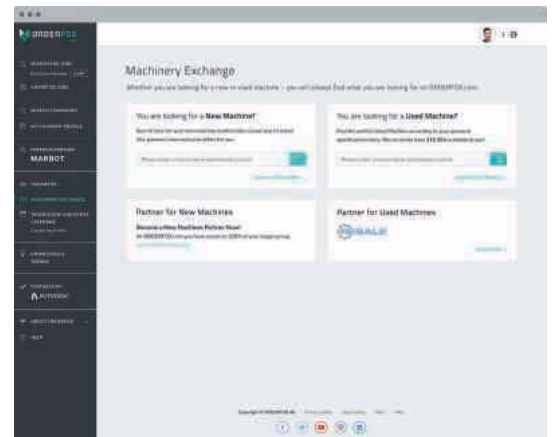
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advertise their own machines within the newest free feature accessible on the platform. The intuitive user interface makes it easier than ever to advertise a machine, regardless of its age, brand or function. In addition to the main and sub-categories, and the various filter function areas necessary for any buyer or seller within the machine procurement process, those who are providing machines for sale can also upload up to eight photos within the advertised posting, that way there is assurance that each machine is represented visually as well. With this new free-to-use feature available on ORDERFOX.com, there is no need to ever pay to advertise the sale of a used machine again.

On ORDERFOX.com, searching, finding and advertising new or used machines is easy and efficient, and follows the same process users are already familiar with when searching for, buying or selling on other unrelated product portals. To make sure that members are receiving the benefits they deserve, ORDERFOX.com is building strategic partnerships with global machine manufacturers, and used machine dealers and portals, to ensure current offerings are available on an ongoing global basis. In the near future, ORDERFOX.com will also be offering access to local financing and transportation partners within the machinery exchange section, whereby members can contact those resources directly to speed up the procurement process.

With the integration of the new free machinery exchange, ORDERFOX.com is taking another leap forward in the



development and advancement of the platform built specifically for the CNC industry, proving once again that ORDERFOX.com is the Internet of the CNC industry. Machine manufacturers used machine dealers, distributors, and individual members are all welcome to take advantage of this free feature on ORDERFOX.com, and become part of the largest industry related network to help streamline and advance the manufacturing and production industries on a global scale.

ORDERFOX AG, based in Ruggell in the Principality of Liechtenstein, offers ORDERFOX.com, the only free global platform solution with which companies in the CNC metal and CNC wood processing industries can actively manage digital change. ORDERFOX.com makes it easy for companies to meet the challenges of digitisation and Industry 4.0.

**ORDERFOX AG**  
**Tel: 00423 3752500**  
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**www.orderfox.com**

# Mastercam announces new 4-axis mill post processor

CNC Software, Inc., producers of Mastercam CAD/CAM software, has announced a 4-axis milling post processor that will unleash the highest productivity on SINUMERIK-controlled machine tools. The new post processor was developed utilising the technical expertise of Siemens CNC engineers.

This post processor includes support for SINUMERIK 840D sl and 828D CNCs from Siemens. It features: Cycle 832 support for high-speed settings, now including the latest top surface functionality; Drill cycles, cycles 82, 83, 84, 85, 86, 840, with full 4-axis support; workpiece output for graphical simulation, including rotary axis blank orientations; tool call as tool name or tool number; TOFFR option; Siemens 4-axis application guide; optimised multiaxis toolpath utilising the FGROU and FGREF commands; streamlined program editing with the GROUPS functionality.

Pedro Sanchez Jr., post department manager of CNC Software, Inc., says: "The development of this new 4-axis post for Mastercam 2019 demonstrates our ongoing

commitment and collaboration with Siemens, to bring the highest productivity gains to machine tools, that began more than two years ago with the release of our 3-axis milling post processor for Mastercam 2017."

It is cooperation like this that provides Mastercam users the opportunity to truly complement their CAM investment and give their shops the best chance at a more efficient manufacturing solution, from design to part.

Chris Pollack, virtual technical application centre manager for Siemens Industry, Inc., concludes: "With a strong continued collaboration, we're able to optimise product performance for both the Mastercam software as well as the SINUMERIK control. This allows our mutual customers to achieve the very best out of their resources. Seeing what we've already been able to accomplish, Siemens looks forward to continuing to help Mastercam create more advanced post processors in the future."



Headquartered in Tolland, Connecticut, CNC Software, Inc. develops Mastercam, a Windows®-based CAD/CAM software for 2-5-axis routing, milling and turning, 2-4-axis wire EDM, 2D and 3D design, surface, and solid modelling.

**UK Agent:**  
**4D Engineering Ltd**  
**Tel: 01285 650111**  
**Email: sales@mastercam.co.uk**  
**www.mastercam.co.uk**

# ModuleWorks 4D cutting simulation

ModuleWorks, a leading supplier of CAD/CAM software components for machining and simulation, has announced the release of its next generation 4D cutting simulation software. ModuleWorks 4D simulation enables users to step forwards and backwards through the simulation to quickly identify, evaluate and resolve potential machining issues.

4D simulation is delivered as part of the ModuleWorks industry-proven cutting simulation software. When integrated in a CAM system, the 4D simulation technology lets users step back through the simulation to inspect the material after each simulated cut. For optimal analysis and troubleshooting, users have full control over the amount of material that can be replaced at each playback step.

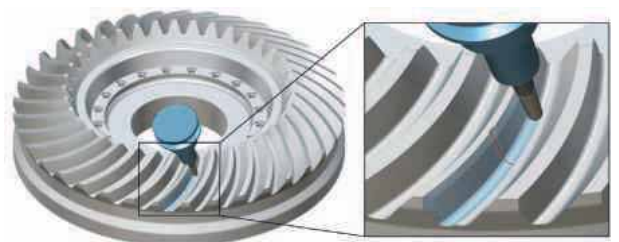
Material removal and replacement can be repeated as many times as needed and the simulation can be paused at any point to run analysis functions, such as deviation and section plane analyses, for faster and more accurate identification and resolution of

issues. Once the cause of the problem has been found, the corresponding move can be located in the move list and corrected in the CAD/CAM system.

Marian Stefan, simulation product manager at ModuleWorks, says: "4D simulation is the latest advance in our cutting simulation software and brings added-value to CAD/CAM systems by making it easier and faster to identify and resolve potential machining problems. We are already working on the next developments that will further enhance the graphical analysis capabilities."

ModuleWorks 4D simulation is available now as part of the ModuleWorks 2018.04 release.

ModuleWorks is a software component provider for the CAD/CAM industry. ModuleWorks' expertise in toolpath creation and simulation is recognised throughout the CAM industry and its



The red line shows where too much material is cut from the part

software components and development services are used by the majority of the leading CAM vendors for sophisticated industry focused solutions across diverse business sectors. ModuleWorks 5-axis and simulation software has been used in the manufacture of complex parts for over a decade and it has many users across the global CAD/CAM industry.

**ModuleWorks GmbH**  
**Tel: 0049 241 9900040**  
**Email: info@moduleworks.com**  
**www.moduleworks.com**

# The easy way to collect production data

To help UK manufacturers maximise data-driven productivity, FANUC has unveiled MT-Linki: a fully scalable, out-of-the-box machine tool monitoring solution that can monitor and manage data from one, to one thousand, machines. First unveiled to the UK manufacturing community at MACH 2018, MT-Linki is a single software platform that is able to collect, manage and visualise data from FANUC and non-FANUC-controlled equipment and devices via an OPC UA server protocol.

Crucially, MT-Linki pools the production data over a secure network into a single centralised point, meaning it can be analysed remotely from the production office, without the need to visit each individual piece of plant equipment on the factory floor. As such, any necessary counter measures can be actioned immediately.

Tom Bouchier, managing director of FANUC UK, says: "Connectivity is undoubtedly driving change throughout the UK's industrial landscape. It's often referred to as Industry 4.0, the Internet of Things (IoT) or Smart Factories, but titles like these have the potential to overcomplicate what should be huge asset to manufacturers.

"In its purest form, connected manufacturing should allow a factory manager to remotely monitor production data for all plant equipment from one single point of access. They should then be able to review performance as a whole and identify any changes that can be made to improve productivity. This uncomplicated thought process was central to the development of the MT-Linki system."

MT-Linki is easy to set up, with no special hardware required, and has a scalable system architecture to accommodate future factory growth. The data acquisition is



managed by a dedicated Collector PC software, and then securely stored on a Server PC, which also provides a web-based user interface for data access, visualisation and analysis. This can be accessed via any PC or internet-enabled tablet within the factory network via a web browser.

The MT-Linki's ability to assess the production status of the entire factory floor at a glance, in real-time, is particularly beneficial. Any alarms or anomalies that may affect production can be spotted and addressed, while critical production data such as feed rates, spindle / servo loads and machine temperatures can also be accessed. The program allows factory managers to review operational results on an individual machine level, meaning production results can be compared easily to forecasts.

Other productivity-driven functions include the ability to easily assess the utilisation factor of plant equipment. Through MT-Linki, manufacturers can see any under-used machines, and make any

changes to the production schedule for optimised resource planning.

The diagnostic capabilities of the MT-Linki system can also help factory managers identify bottlenecks.

While up to 100 machines can be handled by just one MT-Linki server, the Collector PC and Server PC functions can be run from a single standard PC for factories that operate just a handful of machines. For sites operating over 100 machines, it is possible to pool data from 10 server PCs via an integrated server, thus expanding the system architecture's monitoring capabilities to up to 1,000 machines from one point of access.

**FANUC UK Ltd**  
**Tel: 024 76 053000**  
**Email: [info@fanuc.co.uk](mailto:info@fanuc.co.uk)**  
**[www.fanuc.eu/uk](http://www.fanuc.eu/uk)**

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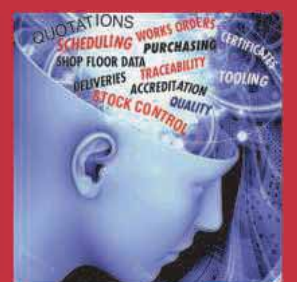
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# Speed and efficiency with Lantek

Midtherm Laser specialises in laser cutting and folding and, with around 40,000 parts going through its workshop every week, needed an efficient way of handling the large volume of administrative work necessary to deliver high quality parts on time at a competitive cost.

Mark Hannon, works manager for Midtherm Laser, explains: "We moved to our Dudley site in 2004 and, since then, we have grown to four Bystronic CO<sub>2</sub> flatbed lasers, one Bystronic fibre laser and two press brakes. Before we installed the Lantek software we used around four software packages which did not connect to one another to manage the business."

Lantek's CAD/CAM and ERP system has enabled Midtherm Laser to smooth its quotation, customer relationship and production processes, nest parts and program all five of its lasers in one system. It can control non-CNC processes such as folding, powder coating or tapping and automatically generate delivery notes and invoices.

The company has around 350 live customers. Because of its reputation and service some of these simply order parts without asking for a quotation. However, Midtherm still needs to create in the region of 800 quotations every month which is a simple, and fast, process with Lantek. Mark Hannon says: "We get CAD models, DXF files, drawings or even just a description of the part or kit to be quoted for. We manufacture a huge variety of parts from different industries including pharmaceutical, aerospace, automotive, petro chemical and construction, so we need to be very flexible. We import the CAD data or redraw it where necessary to get it into the Lantek software. All the customer and job data is only entered once, while within the system we have the price per kilogram of the material which we update monthly. We can then choose how we want to define the material usage, for example, laser with common line cutting or whether to nest parts in a large cutout on a particular job. The system already knows the cut length and we have a

generic machine defined for cycle time generation. With this information, we can create a new and accurate quotation extremely quickly."

During the configuration of the Lantek system, Midtherm Laser worked through the large number of parameters available within the system with one of Lantek's engineers. Once the defaults have been set to suit the machines and way of working, operation is very simple as the layout of the different

parts, and which may use up tracked and identified sheet remnants from previous operations, maximising material utilisation.

As each process is completed, including non-CNC and external operations, the information is fed back into the Lantek Manager software, instantly updating the status of each part.

Mark Hannon concludes: "Our order input has increased vastly, and delivery times have gone from 5-7 days to 4-5 days and, despite



screens within the Lantek system is consistent so editing parameters where necessary is intuitive. The user can even simulate the nest of parts, if required, to get an even more accurate cost. Using the generic machine configuration gives Midtherm the flexibility to choose which of its five machines to cut the parts on. Once the quotation is finished it is recorded with a unique number and it is emailed to the customer, set out in a format tailored to Midtherm's requirements.

Once the order is placed, the quotation becomes a sales order with the click of a button. Parts are amalgamated with all the other ordered parts according to material and thickness and delivery date. A dynamic nest is created which may feature parts from several different customers, as well as stock

the recent huge drop in material prices, our turnover has gone up which means we are producing more parts with the same machinery. More importantly, profits are up by 10-15 percent. Administration is much quicker and because it is all in one system our employees are collaborating much better as they all understand the complete process and can switch between roles. We are now considering a 3rd shift which will provide us with even more efficiency through reduced energy costs at night."

**Lantek Systems Ltd**  
**Tel: 01684 342345**  
**Email: sales.uk@lanteksms.com**  
**www.lanteksms.com**

# Production control software key to Teflturn's expansion

Having relocated from Flitcham to larger premises in King's Lynn, Teflturn Ltd has been able to take on more staff and, as a result, more work. The company is also looking to greatly increase its capacity by adding a 32 mm sliding head lathe to complement its current Star sliding head and XYZ turning and milling machines. These investments are being made on the back of existing PSL Datatrack production control software, which continues to give Teflturn far reaching benefits in its business administration and production control.

Teflturn supplies components in PTFE and a variety of other plastic materials to industries as diverse as food and dairy, electrical, medical and engineering. Products include everything from gaskets and seal washers to more complex sensing probes, thermocouples and compression fittings. As a small company priding itself on personal service, Teflturn's main problem in managing its business had been the

amount of time, five days a week, taken just manually generating and typing quotations for customers. This was a clear obstacle to the success of the business and was having a detrimental effect on customer service.

That changed when managing director Mick Finney heard about PSL Datatrack production control software from a colleague in the metal subcontract engineering business who was already a PSL Datatrack user.

Mick Finney says: "This was the type of system we needed as a plastics parts manufacturer. It could relieve all the manual administration around quotations and, having arranged for PSL Datatrack to visit us and give a demo, we quickly made the decision to invest in a software package."

The company initially opted for modules that covered the key aspects of its business including quotations, works orders, process layouts, deliveries, invoicing and job costing. Subsequently, purchasing, goods

received and material stock control modules were added. Even more may be added in the future.

Mick Finney continues: "This means that we now have everything needed to run the Teflturn business efficiently and professionally. Any subcontract engineering business would find PSL Datatrack helpful as their business would also likely be based around multiple customers needing varying batch sizes or call offs and where components have to be supplied in many different material types and variations."

Indeed, with several variations of PTFE materials used regularly in plastic parts manufacturing, and with suppliers' records held within PSL Datatrack, Teflturn can see all of the variations available from different suppliers including when they were supplied and how much they cost. This allows price comparisons to be carried out and checks on whether deliveries from a supplier have been satisfactory. With this information



Tefloturn can be much more confident when quoting customers in terms of speed, reliability of delivery and cost.

The ability to speed up the process of creating customer quotations has been a very important benefit. These are now produced in a matter of minutes and it is also much quicker to requote companies who may come back frequently or ask to be quoted once every few years.

Mick Finney explains: "This is vital for many of our customers who need to quote quickly themselves. They know they are getting accurate and reliable information from Tefloturn and that inspires confidence. Whenever they contact us we can simply enter their name into the PSL Datatrack system and retrieve the relevant information, what we quoted previously in terms of quantities, prices, materials used, material costs, our suppliers and so on. Once a customer is in the system they are there forever, and we have all the historic records we need. With this information ready to hand we can quote for a new job much more quickly and give informed details on delivery times."

Learning how to use the software was straightforward and a training day was spent

at PSL Datatrack's headquarters looking in more detail at particular aspects of the system that would be utilised regularly by Tefloturn in the initial period. This process took away the fear factor and Tefloturn staff were able to learn more as they went along. Telephone support service has also been provided and PSL Datatrack can take over Tefloturn's computers remotely if necessary in order to demonstrate how to do new things or to improve on anything.

Getting products out of the door is Tefloturn's number one challenge and there are some 50 regular customers who require delivery of everything from one-offs to batches of up to 10,000. By centralising everything through PSL Datatrack the company is able to fulfil its requirements in the most efficient way.

Mick Finney concludes: "We have just recruited an additional staff member and we know that by using PSL Datatrack that person will be quickly integrated into the effective running of our business. I cannot recommend PSL Datatrack as a company and as a product highly enough. The software runs our business, has enabled us to dramatically cut down long hours of administration, and has given us a reliable



platform for growth, all-round quality management and customer satisfaction."

Prospec Systems Ltd is a market leading author and supplier of PSL Datatrack production control software. The company was established in 1988 and has supplied computer software solutions to manufacturing businesses for 30 years. Its aim is to supply a practical, simple and logical solution to managing your production which will help customers manage their business more efficiently. Its background skills in IT, engineering, accounting and business management enable it to provide economic and effective software solutions. It is proud to support British manufacturing and all of its software is designed, developed and supported from its offices in Bracknell, Berkshire.

**PSL Datatrack**  
**Tel: 08456 345931**  
**Email: sales@psldatatrack.com**  
**www.psldatatrack.com**

## Renishaw improves consistency in additive manufacturing

To allow additive manufacturing users a greater understanding of their processes, Renishaw has developed new process monitoring software, InfiniAM Spectral, for use on Renishaw systems. After its successful launch at formnext 2017, Renishaw released the software package to help manufacturers overcome the barriers to AM in critical applications, process stability and part quality.

Laser Powder-Bed Fusion (LPBF) builds components from millions of laser exposures. This process must be highly accurate to produce a functional part. However, there are sources of variation that can occur during the build process, which can produce anomalies that impact the longevity of the part. Real-time spectral monitoring technology enables manufacturers to gather melt-pool data to enable traceable production and process optimisation.

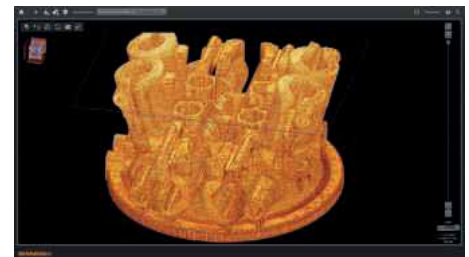
InfiniAM Spectral is part of a developing family of products that helps users capture, evaluate and store process data from Renishaw LPBF technologies. The software

enables data capture, presentation and analysis, representing a powerful tool for developing a deep understanding of the AM process.

The new software offers two measurement functions in the sensor modules. The first module, LaserVIEW, uses a photosensitive diode to measure the intensity of the laser energy. The second module, MeltVIEW, captures emissions from the melt pool in the near-infrared and infrared spectral ranges. These two sensor signals can be compared to help identify discrepancies.

MeltVIEW and LaserVIEW stream data across a conventional computer network on a layer-by-layer basis, so manufacturers can analyse process monitoring data in real-time. As the build progresses, the data is rendered live in 3D for viewing in InfiniAM Spectral. The engineer can compare the data from each sensor to identify any deviations, which may indicate the presence of anomalies that could lead to defects.

Robin Weston, marketing manager at Renishaw's additive manufacturing products



division, says: "For additive manufacturing to become a truly ubiquitous manufacturing technology, users and practitioners require a deep understanding of the process. The software will be hugely beneficial to manufacturers looking to achieve consistent processing with AM.

"The amount of process data generated during an AM build is immense, which means it can be difficult to make practical use of it without the correct interpretation tools."

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



# How to make money with a waterjet cutting system

Two years ago, Sergej Wart, a young entrepreneur from Gütersloh, fulfilled his dream of owning his own contract cutting business. After 15 years of experience in the waterjet sector, the 40-year-old wanted to go his own way, offer more and, above all, fully exploit the versatility of the technology. The company founder found the right partner in STM and really got going with his PremiumCut 3D waterjet cutting system. This resulted in full order books, expansion plans and a young entrepreneur who became an immediate success.

Until he decided to set up his own business, the trained electrician and carpenter first gained twelve years of experience with water jet technology in a natural stone company and then in the metal sector. He became more and more enthusiastic about waterjet cutting over 15 years. While he grew dissatisfied as an employee in the mechanical engineering company, his desire to become self-employed increased.

## The right partner

Sergej Wart did not make the decision lightly. The design of the waterjet cutting system without bellows, which can be optimally cleaned, the speed of the travel path and last but not least the concept of the modular design, which also offers flexible expansion options retrospectively, ultimately spoke in favour of STM.

Sergej Wart confirms: "The process was smooth and the setup worked great. The machine ran from day one and I was able to start cutting immediately."

## Success through versatility

To be able to cut any material without much effort is, to Sergej Wart, one of the points that makes waterjet cutting so interesting.

Sergej Wart explains: "At first, I didn't



want to commit to a certain material, wanted to remain open to what was to come and the waterjet is simply the ideal tool for that." He currently specialises in cutting ceramics. In addition to large tiles, washbasins and kitchen worktops, the range also includes sliding doors and steps. The possibility of 3D cutting sets his company apart from the competition." Sergej Wart says: "That was a good investment, nobody else can do it within a radius of 100 Km."

The up-and-comer has succeeded in becoming successful with an STM cutting system without much support. Sergej Wart says: "It's simply fun to realise my ideas." Sergej Wart explains his motivation. So far, the young entrepreneur has only regretted not having invested in a larger hall. The order books are full. Meanwhile, his wife helps him with the bookkeeping and also cuts independently at the STM cutting machine. Two more employees would be needed to process all requests. At the same time, even more space would have to be created to be able to exhibit the products. Sergej Wart confirms: "The current area of 300 m<sup>2</sup> is not enough. I would need around 1,000 m<sup>2</sup>." There would also be room for the desired additional STM waterjet cutting system then.

## The technology

Sergej Wart decided to start his business with an STM 2030 PremiumCut 3D and in doing so backed the right horse. The

machine features a work surface in large format of 2,000 x 3,000 mm with the STM3D head up to 68°.

STM is a leading provider of waterjet cutting systems with its head office in Eben, Austria and Schweinfurt, Germany. For more than 25 years, the traditional company has developed future-proof production solutions, mainly for the steel, aluminium, metal, plastic, stone and glass industries, which are most notable for their efficiency, ease-of-use and resistance to wear. Alongside future-proof technology and quality as standard, STM places great emphasis on innovative full service. In so doing, the brand manufacturer ensures that its individual manufacturing processes are continually matched to the latest requirements of its customers.

STM Waterjet Germany, formerly Maximator JET, has been the development and sales location in Germany since 1999. The company focuses on developing and realising highly specialised waterjet cutting systems for all kinds of special applications here. The company STM stands for pioneering production solutions and unlimited individualisation options.

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# Waterjet capability and reliability

Lasershape was founded in 1988 as one of the first suppliers of subcontracted laser cut components in the UK. Since then, it has continued to invest into the latest technology, and its employees, to grow into one of the leading companies in the industry. Waterjet cutting was added in 2003 to continue innovation and expand the offering to new and existing customers. Today, Lasershape's Waterjet process is accredited to AS9100 for all aerospace applications.

The latest step for Lasershape, to align with Industry 4.0, is using data for smarter business decisions. After visualisation of the vast amount of data, bottlenecks became visible and analytics supported new strategies to increase throughput of individual work processes. Lasershape invested into Techni Waterjet for its innovative pump technology. The Quantum Servo Pump from Techni Waterjet offers a lot of intelligence and data about performance.

Lasershape initially replaced a conventional hydraulic pump in August 2017, with a Techni Quantum Electric Servo Pump, to increase throughput within its waterjet cell. Combined with a service contract package with AMC Jets, over the past year, the pump has performed 24/7. The efficiency of the waterjet cell jumped from 65 percent to 96 percent in a matter of days. 12 months on, the pump has ran for over 5,000 cutting hours.

Earlier in 2018, Lasershape invested

further into the latest technology from Techni Waterjet and AMC Jets with the acquisition of a brand new Techjet TJ4100 waterjet cutting system, complete with a 4 m x 2 m cutting area and abrasive removal system.

The Techjet series machines are built to the highest tolerances and incorporate linear scale feedback to ensure the highest accuracy of motion within the industry. By mapping the entire cutting area with a laser calibrated digital encoder, the motion system can deliver positional accuracy of 0.0005" (0.01 mm).

Jason George, facilities manager at Lasershape, says: "Lasershape has been running waterjet machines for many years, now as part of our 24/7 subcontract profiling cell. We demand a lot from our machines and indeed the supplier, in order to maintain high efficiencies. This means that we need quality machines with top class support. Due to a need to replace one of our older machines, we went in search of a new alternative and promptly contacted AMC Jets for advice since they have been our supplier of waterjet consumables for some time and their service is second to none.

Due to this exceptional standard of support, and the good things we had seen from Techni, we opted to replace our traditional hydraulic pump with a Techni servo drive alternative; we were so impressed that shortly after we replaced the bed with a Techni Techjet. The Techni's reliability has been a breath of fresh air and



the service and parts, when needed, have been readily available. This is now frequently our most efficient machine."

With the Quantum Electric Servo Pump running alongside the new machine, Lasershape now consistently experience a minimum of 500 hours of cutting without any maintenance intervention. When a seal change is required, it takes less than 10 minutes. This results in higher machine productivity, increased 'up time' and therefore helps get more orders shipped out to customers as soon as possible. As the Quantum pump is also driven by an electric servo motor, this results in lower running costs, higher efficiencies and a virtually silent operation.

Tom Shore of AMC Jets comments: "Lasershape's recent decision to invest in a new Techni Waterjet system highlights the company's determined focus around offering increased waterjet capability and reliability to their ever-growing customer base. It is exciting to have formed a close relationship with a company that has enjoyed sustainable growth over the past few years, and will no doubt continue to do so."

Techni Waterjet has been operating for over 29 years and has an installation base of almost 1,000 waterjet machines or water cutting systems spread across six continents and some 26 countries.

AMC Jets has been supplying high-quality spare parts and machine servicing to the UK market for over 28 years and decided to collaborate with Techni Waterjet for waterjet sales and service in early 2017.

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# Dunphy's cycle machining offers limitless customisation with ProtoMAX

"Ever since I was 14 years old I was a gear head. I almost have a sickness and can't drive a stock vehicle because I don't want to be like everyone else. It's boring," says Dan Dunphy of Dunphy's Cycles Machining, LLC. Dan Dunphy continues: "In 2016, I began to stay late at a local machine shop with a co-worker. They have an OMAX 2626® waterjet." He used the waterjet to make parts for his own 2016 Harley Davidson Street Glide Special.

Dan Dunphy explains: "I was making custom badges, shift linkages and floor boards. I knew I had a money maker on my hands after some positive feedback and requests from people on the web. I wanted to make custom motorcycle parts but knew it would be too time-consuming programming them for a CNC mill and lathe. The waterjet is so much faster and easy to program which is why it worked best for us."

In 2018, Dan Dunphy purchased a ProtoMAX® abrasive waterjet and started his own business, Dunphy's Cycles Machining. He affirms starting a business with his waterjet was "the best decision in my life I have ever made."

For a compact, personal waterjet, the ProtoMAX is the first high performance machine of its kind. Integrating cutting components and pump into a compact footprint makes the ProtoMAX ideal for small or space-constrained shops.

Dan Dunphy says: "The programming software for the ProtoMAX is so easy to learn if you have general machining experience or use of CAD software. We can simply load an image and adjust it as needed, where CAM software on CNC mills and lathes can get a little tricky and time consuming. Plus, it's simple to draw up a part from scratch."

The programming of part files and the cutting operation are controlled by a version of OMAX's own Intelli-MAX® software specifically designed for the ProtoMAX.

The shop utilises several welders, a 3-axis CNC mill, and the ProtoMAX abrasive waterjet to produce its custom parts.

Dan Dunphy says: "We cut a lot of 6061 T6 aluminum ranging from 0.016 to 1.0 in. thickness. So far, we have cut various thicknesses of A36 steel and plastics. There has not been one thing we haven't been



able to cut on the waterjet yet. The mill and waterjet work great together for making some pretty cool parts."

Some of these 'cool parts' are showcased on [Dunphycycles.com](http://Dunphycycles.com). However, the custom shop is just that, custom. With the ProtoMAX, Dunphy's can and will personalise any part for your bike.

Currently, the shop is creating display pieces for local Harley Davidson retailers, as well as building a 2007 Harley Davidson Softail Deluxe as a way to show off the shops capabilities. With the added exposure and increased demand for customer bike parts, Dunphy's is starting to customise pieces of Indian and Victory cycles as well. But that's not all, the shop has expanded beyond motorcycles into other customisation.

Dan Dunphy says: "We have made parts for gun jigs and are currently manufacturing parts for a local marine store here in Washington. Making parts for boats such as motor mounts, down riggers, etc. In the time we have been in business I've already seen people, and companies, trying to copy our parts using different CNC equipment."

Abrasive waterjets and large CNC tools are typically something you don't see in makerspaces, or with personal businesses, due to the high cost associated. In response, the ProtoMAX is a cost-effective answer to the waterjet/price question. Dan Dunphy continues: "They are constantly asking us how they are made and what machines we are using. It will only be a matter of time until they figure out that we make our parts on a waterjet."

Dunphy's Cycle Machining is only starting to rev up. Dan Dunphy concludes: "We are growing rapidly and can't wait to see the things we are about to achieve in year number two in business all because of our waterjet."

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# Full 3D abrasive waterjet cutting redefined

Water Jet Sweden is busy building a new FiveX machine system after winning another order for the UK market.

Each FiveX machine is a unique solution based on specific customer requirements. Built on the same platform, but bespoke in width, length and height specifications, it allows for a tailored solution to specific customer requirements.

Product development, driven by customers' demands and market needs, is at the core of what the Swedish firm has been doing for decades.

Since its international breakthrough in 1999, winning the prestigious order from Daimler Chrysler Aerospace, Water Jet Sweden has been serving high tech industries, like aerospace, defense, chemical and power corporations, all over the world.

WJS has one of the broadest waterjet product portfolios in the world and the FiveX Machine System is the most advanced machine model in the portfolio. With a Z-movement of 750-1,500 mm and a  $\pm 0-91^\circ$  cutting angle, it is specifically designed to manage high precision 3D abrasive cutting in space.

When building a FiveX machine you need to look carefully at all the safety aspects. If not interrupted, a waterjet beam could be lethal, therefore all FiveX machines are designed with full size side walls and automated front and back protection.

With this application the challenge was to cut cone shaped holes on a vertical surface. Tony Ryd, technical director at Water Jet Sweden, says: "The standard machine specification has a maximum cutting angle of  $\pm 91^\circ$  which wouldn't be enough, so we were forced to redefine machine specification and introduce a new cutting head with  $\pm 0-120^\circ$  cutting angle. After a thorough evaluation of component suppliers, we finally found a solution that met our long life and high-performance standards."

Even though the FiveX model is a highly complex machine system, the PanelOne HMI makes it smooth and easy to operate. PanelOne is a modern HMI with touchscreen buttons and a simple joystick movement which requires just a few days of training to master.

Tony Ryd continues: "Another unique feature on this specific machine project is a new cost-efficient sensor function, fully



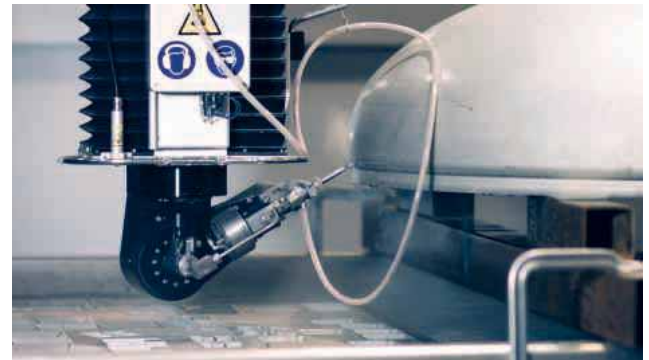
integrated in the PanelOne HMI. When started, the safety lid opens, and it automatically identifies the 3D workpiece placement and sets the zero point. Then, without halting, the program goes directly into cutting mode."

WJS machines are powered by top of the line ultra high-pressure pumps from leading OEM suppliers in US and Europe, KMT and BFT. They safely deliver consistent ultra-high-pressure water and the digitally controlled abrasive feeders mounted on the machine secure the cutting process.

The machine design is extremely stable. Linear drives on the X beam, and ball screws on X axis, safely and repeatedly performs high precision free form cutting, with a repetition accuracy of less than  $\pm 0.025$  mm. The Water Jet Sweden world patented gantry machine design is unique, since it enables the same cutting accuracy independent of machine table size. A 2 m machine is as accurate as a 6 m machine. The FiveX model is designed for both 4100 bar and 6200 bar, which makes it stand out compared to similar products in the market.

With a reputation for long life machines and consistent performance, Water Jet Sweden offers a 5-year performance warranty proving the quality of the machine design, parts and components, on this machine model as well as all others.

Tony Ryd adds: "We guarantee that all



our machines keep the same tolerance level after five years as the day when the machine was first delivered."

Gavin Bell, WJS UK sales director, says: "It's been great to see this project come through from the test cutting phase to the customer placing an order. We worked on delivering a bespoke solution based on the customer application and that's exactly what we achieved. We've seen a growing number of 5-axis enquiries as UK manufacturing continues to expand."

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# Timesavers machine does just that for Dutton Engineering

The installation of a Timesavers 42-1350-WRb deburring, edge rounding and finishing machine by Ellesco at Dutton Engineering is delivering significant cycle time reductions, along with improved and consistent quality when it comes to deburring and graining punched, lasered and waterjet cut parts.

Dutton Engineering, based in Sandy, Bedfordshire is a specialist sheet metal subcontractor. The focus of its 40 years has been stainless steel sheet. With customers in the food processing, medical and architectural sectors, among others, attention to detail, premium finish and quality products are essential to maintaining good customer satisfaction. With a turnover of £3 million and employing 40 people, the company prides itself on the quality of its work; most of which is visible in the finished product.

Andrew Read, managing director of Dutton Engineering, says: "We pride ourselves on the quality and on-time delivery promises that we keep and, with our production focused mainly around high-value stainless steel, the parts we produce must reflect the materials inherent value in both visual and handling terms. For this reason, we place foremost focus on deburring and graining."

The company aims to be more than just a 'supplier of parts'. It encourages customers to visit its premises so that relationships can be built in order to draw on the expertise available at Dutton Engineering. Whether they just need sheet processing capacity or, a full design for manufacture solution.

To support its customers, Dutton Engineering has a comprehensive capacity list including punching, laser, waterjet, bending and forming, as well as milling and turning capabilities. The company uses two other Timesavers machines, which the company has had for several years. These are only used for surface graining and finishing operations. When a new contract demanded guaranteed consistent burr free parts, which contained multiple slots, the decision to purchase the Timesavers 42-1350-WRb was straightforward. With its combination of wide abrasive belt head and an eight brush rotary head, this 42 series



machine combines both deburr and graining operations in a single pass. The inclusion of a vacuum table also adds greater versatility as the machine is capable of processing parts ranging from 1,350 mm wide sheet up to 4,500 mm long, down to parts measuring just 50 mm by 50 mm and up to 150 mm thick.

Andrew Read says: "The advantage we are getting with the Timesavers machine is the ability to generate a consistent edge on components, which is something we now use as part of our sales proposition to customers. When compared with deburring manually, not only have we gained in terms of quality but also time, with processing times being reduced typically by 75 percent for deburring parts. This is a major bonus as removing any burrs is important for us, especially with the work we do for customers in the food processing sector, where there is the need to eliminate any risk of personal injury or contamination."

The ease-of-use of the Timesavers 42-1350-WRb is also a big plus for Andrew Read, as the size of the machine table means that multiple parts can be processed simultaneously, and only requires an operator to feed/remove parts, allowing Dutton Engineering's highly skilled polishers, who used to be involved in



manual deburring, free to do the work they are best suited to.

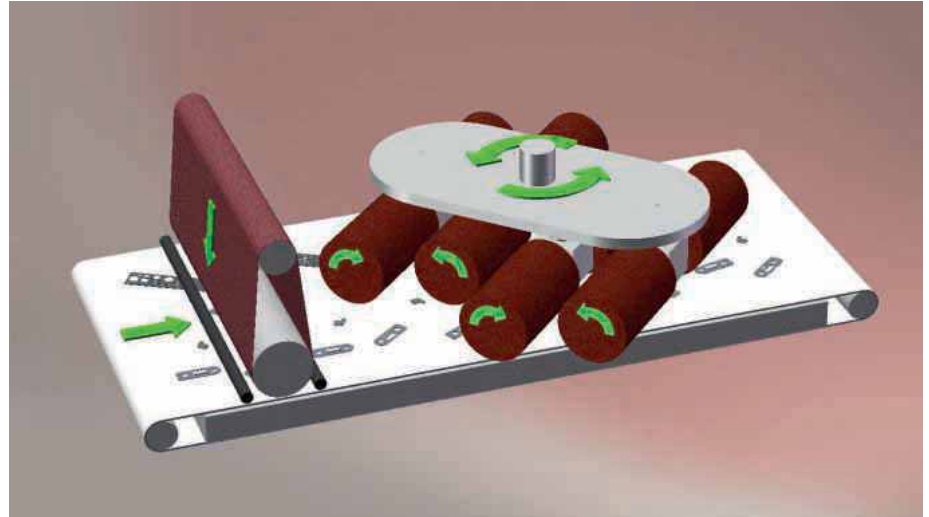
Andrew Read says: "With just 30 minutes training, we were up and running and, once the machine is set, that's it, there is nothing more to it. With the addition of the rotary brushes for deburring the new machine provides much greater flexibility in terms of production, with key benefits being the ability to process punched and lasered parts as well as those that have been cut using our waterjet machine, which may not have burrs, but do have sharp edges to them that need to be rounded off, whether on external or internal edges, such as holes and slots. Due to the importance of the finished product in visual terms we can also deburr sheet that still has its protective plastic coating applied."

In addition to deburring, the Timesavers 42-1350-WRb machine also creates



consistent edge radii, a process made simple by the easy-to-use control system allowing the machine to be set in minutes with minimal training. The Timesavers 42 series machines can be configured in multiple ways to suit specific customer applications with customers able to choose machines built with multiple abrasive belts or combinations of abrasive belt and rotary or stationary brushes. Machine widths can be 1,000, 1,350 or 1,550 mm, with table speeds ranging from 0.2 to 10 m/min. The machine's functions are controlled from the strategically positioned control panel which also includes a graphic interface to show details of the parameters that have been set. All of this makes the Timesavers 42 series ideal for removing burrs from parts that can be presented flat to the machine, whether they have been lasered or punched or to remove sharp edges from water jet cut parts. A wide range of materials can be processed, including stainless steel, mild steel, aluminium, and copper.

Vincent Simonis, managing director of Ellesco, concludes: "It is always particularly satisfying when a customer returns for additional machines and it is further reassuring when the reasons that influence



their decisions are the quality and performance of the product and the levels of service that we provide. We have worked with Timesavers for over 40 years, so we have been party to the invention of this technology. We know the designers, and we particularly know the capabilities of the machines inside out. This means we can quickly assess a customer's requirements and ensure they have the right solution for their particular needs. Any decision on investing in new machinery that the

customer makes remains with them for a long period of time, so it has to be the right decision. Our role is to ensure that any investment in Timesavers equipment helps them to future proof their business."

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clients, or design your own from scratch, and automatically clean up geometry issues. The software provides sheetmetal development capability and the ability to path your part, as FlowXpert automatically creates the most efficient path. By previewing your part, the system will check for any cutting issues.

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# Productivity leap for cam lobe manufacturers

Hatebur has introduced the HOTmatic AMP 20 N, a machine that was specifically designed for the manufacturing of forged cam lobes. With this product novelty, the Swiss company, a leader in high-quality forming machines and tools, aims to improve the efficiency and productivity of suppliers in the automotive industry.

Thomas Christoffel, CEO of Hatebur, says: "Almost all of the worldwide forged cam lobes are produced on Hatebur machines. With the development of the HOTmatic AMP 20 N, we react to new trends in the industry. We want to make our customers even more productive and strengthen our market leadership."



### Thin cam lobes in the focus

To date, most of the forged cam lobes are produced on the two Hatebur machines HOTmatic AMP 30 S und 20 S, reliably and efficiently.

Thomas Christoffel says: "The trend goes towards thinner cam lobes in order to support the lightweight construction of engines." That is why the R&D division of Hatebur has started early with fundamental research on cam lobes with a thickness of 8 mm instead of 12 mm.

"The thinner cam lobes impose the highest demands on the forming machine, in particular in terms of the shearing quality, the pressing force and the part transfer. We now introduce the result of this innovation process worldwide: the HOTmatic AMP 20 N. The machine is ideal for thinner cam lobes with high surface quality, outstanding wear resistance and precise geometries."

### Precise, fast, efficient

The market innovation convinces with a total press load of 1500 kN, an impressive production speed and highest precision. The machine body has been reinforced and guarantees the necessary stability.

Reinhard Bühler, head of marketing and sales at Hatebur, says: "In three forming stations and with a maximum of 200 strokes per minute, the AMP 20 N produces cam lobes with an outer diameter of up to 48 mm out of raw parts with 24 to 217 grams."

The up to 6 m long, almost 1,200 degrees Celsius hot bars are brought exactly into position via four feeder rollers, powered by servo drives.

Reinhard Bühler explains: "When thin parts are being processed, the transport between the forming stations needs utmost accuracy to achieve an ideal surface quality."

A central element of the machine is the shearing unit. Reinhard

Bühler continues: "This is where parts with a cut-off length of 20-45 mm are made. Just as on other Hatebur machines, the surface quality of the shear plane is outstanding. The forming of the parts can start from the first station."

### More output and efficiency

Almost all customary cam sizes for passenger cars can be produced on the AMP 20 N.

Reinhard Bühler says: "Most of the tools are compatible with the HOTmatic AMP 20 S. Low maintenance and operating costs as well as the high productivity lead to an exceptional cost-benefit ratio."

While the AMP 20 N is an ideal machine for the production of forged cam lobes, it is not a single purpose machine as Thomas Christoffel confirms: "The AMP 20 N is flexible and can be used in a wide variety of applications."



Hatebur is synonymous with first-class hot and cold massive forming, exceptional customer service, premium-quality precision tools and process engineering.

Thanks to the integration of Carlo Salvi, Hatebur customers around the world benefit from a wide range of innovative solutions. This traditional company, founded in Switzerland in 1930, employs an international network of fully owned subsidiaries and sales partners to guarantee high-quality products and services that are never far away from its customers. After an in-depth consultation and design process, Hatebur offers a machining solution for producing high volumes of precision metal parts that meets the customer's needs and requirements perfectly. Whether for the automotive, rolling bearing, aviation or fastener industry, it creates solutions that offer maximum performance and efficiency in accordance with its guiding principle: Our performance. Your advantage.

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## tesa ACXplus simplifies sheet metal fabrication manufacturing process

Recognised for its unique viscoelastic properties, which compensate for substrates with different coefficients of thermal expansion, tesa® ACXplus double sided tape delivers excellent stress dissipation and high bonding power for manufacturers in various industries. Now, businesses involved in sheet metal fabrication are using the technology to enhance current production processes.

Already established across industry, tesa ACXplus represents a secure and fast alternative to traditional bonding methods in sheet metal fabrication, such as liquid glues, screws and rivets. Companies that embrace this innovative approach can expect a cleaner and easier process that takes substantially less time with businesses reporting savings of up to as much as 20 percent. It allows the combination of materials, such as aluminium on steel, in the production process, improves aesthetics due to the invisible bond, does not damage surfaces reducing the risk of corrosion and can also act as a water seal.

Fabrication processes often use heat and tesa ACXplus has an elevated temperature



resistance, up to 220°C in some cases, and with the aid of an adhesion promoter can also be bonded to powder coated materials.

Jeremy Smith, tesa UK Ltd trade marketing manager, says: "We are always willing to review current bonding applications and present customers with alternative ideas if we feel we can help them to improve efficiency. The feedback we have received from companies, that have used tesa ACXplus to replace rivets, welding and other mechanical fixings, has been unanimously positive."

The advantages of adhesive tape technology are now well-established. They are light, clean, easy-to-use, durable, high performance, safe and environmentally friendly. With its ACXplus range, tesa has extended the performance boundaries and the application scope of its offering to the metal manufacturing sector.

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# Prima Power opens new technology centre in Munich

Prima Power has opened its new technology centre in Neufahrn, near Munich. The new location is in the heart of the D-A-CH area. As a result, Prima Power is now able to better serve the entire German-speaking market and to be much closer to the regions where its machines are already in use or where the group sees the highest growth potential.

Paolo Musante, Prima Power GmbH managing director, says: "The new technology centre will serve as a centre of excellence and will have a strong focus on customer satisfaction, since from this location we can offer our customers a highly efficient support, especially for the industrial areas of Southern Germany, Austria and Switzerland. Munich, as an international transport hub, is excellently connected to the European railway and motorway network and has the second largest airport in Germany. This is very important for us as a globally active company, especially as it means we can now be reached relatively quickly and easily for our customers from other European countries as well."

Prima Power GmbH in Neufahrn employs 55 people, of which 35 are dedicated to customer support, and covers an area of 1,800 m<sup>2</sup>. Around half of the area hosts the demonstration centre, where live demonstrations of its latest technologies and products can be seen by a large number of guests.

In addition to offices, two conference rooms are available with a direct view of the demonstration centre. They are mainly

destined to events, customer visits, meetings, seminars, but also training for Prima Power engineers and employees in general.

In line with Prima Power GmbH growth strategy, the aim is to have a team of 70 employees in the new subsidiary by 2020. The expansion is mainly foreseen, in addition to sales and service, in application and training staff, to further grow as a state-of-the-art competence centre.

Prima Power GmbH is part of Prima Industrie, a group with more than 1,700 employees around the world and €450 m revenues. The group in 2017 celebrated 40 years of activity and a record year for all main financial indicators, with a 14 percent increase in revenues, an 18 percent increase in its order intake, and 83 percent increase in net profit.

The overall investment for the new Prima Power GmbH facility, including building works and machines installed at the technology centre, etc, amounts to 4 million euros. The D-A-CH area is strategic for the group, as it represents one of the most important markets in Europe, with 5 percent of revenues realised in this market and an installed base of over 1,000 machines. The opening of the new facility in Munich is part of a larger plan of investments to increase its presence on the most important markets and to expand and improve its set of technology centres, for a better and more complete customer experience.

As part of the opening event, guests were given a live demonstration of the

technology centre's capabilities and could attend a series of lectures on main trends of sheet metal processing, such as 3D fibre laser cutting and Industry 4.0. Theory and practice will be combined in order to give the widest overview of the sector.

In the new technology centre, the latest innovations in the company's product portfolio are on display. They include: the fastest 3D fibre laser cutting machine on the market Laser Next 1530, the high performing 2D fibre laser machine Laser Genius 1530, the combined punching and fibre laser system Combi Genius 1530 with servo-electric technology, the highly efficient servo-electric bending cell BCE Smart, and the fast, accurate and efficient servo-electric press brake eP-1030. All products are Industry 4.0 Inside for digital, interconnected and data-driven manufacturing.

Paolo Musante concludes: "The opening of the new technology centre in Munich is a key step in support of Prima Power's continued growth in the D-A-CH market, where we see strong growth potential for Prima Power in all industrial markets. This new location will allow Prima Power to offer a stronger and more efficient direct support to new and existing customers in the area."

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## Taking fully electric tube and pipe bending to the next level

Schwarze-Robitec is to present a world first at Fabtech in November, the biggest fully electric multiple-radius tube and pipe bending machine featuring transport boost technology. By showcasing its CNC 220 E TB MR, at the exhibition, the traditional German company will demonstrate how complex tube geometries with diameters of up to eight inches can be produced swiftly, flexibly and efficiently. By delivering consistent precision during the tube and pipe bending process, the new machine enables users to achieve high productivity in its production processes, regardless of batch size.

Extraordinary in terms of dimensions and capacity, Schwarze-Robitec's new product, the CNC 220 E TB MR, represents a milestone in the production of fully electric, multi-stack tube and pipe bending machines. Forming part of the high-performance-series, the CNC tube and pipe bending machine is unique in terms of the capacity it offers. It was developed by the tube and pipe bending machine specialist for one of its American customers

active in the automotive industry. The machine fully meets the high requirements it faces in terms of short cycle times, top speed and maximum flexibility. The maximum bending capacity of the CNC 220 E TB MR amounts to a diameter of up to eight inches.

The multi-stack tube and pipe bending machine can bend an especially broad spectrum of tube and profile dimensions. It can process tube and pipe lengths of up to 13 feet, with a vertical height-adjustable pressure die moving to the required bending level in each individual case. This enables users to better gauge the requisite bending forces and consistently apply the optimal contact pressure to the tubes and pipes they plan to bend.

### Maximum productivity

Used in combination with individually adjustable tools, the multilevel technology integrated into the CNC 220 E TB MR allows tubes and pipes to be bent simply and precisely, with very low distances between bends. The machine also features the NxG



control system, which contributes to the swift cycle times offered by the High-Performance-series. By optimising time, tool path and speed on all CNC axes, the system enables users to significantly enhance productivity. Depending on the tube or pipe system to be bent, production times can be slashed by up to 35 percent.

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# Solving the fabrication challenges critical to ammonia capture

As a high-end precision fabricator, with over 40 years' experience of manufacturing high performance vessels and structures, LTI Metaltech understands just how vital it is to maintain the highest possible standards of quality and performance.

So, when Siemens CT tasked LTI with manufacturing the critical components for a high-profile, government-funded ammonia capture project, whose application needed to withstand some of the most extreme temperatures and pressures, its skills and experience were vital.

By drawing on its high-level expertise in fabrication, design and advanced welding techniques, LTI was able to successfully manufacture the components needed for a process known as ammonia synthesis, where hydrogen and nitrogen are converted into ammonia, using a catalyst, which must be performed at extremely high temperatures and pressures.

The capture of 'green ammonia' is seen as crucial in helping the world to meet its twin challenges for the 21st century. Namely in ensuring there is sufficient future food and energy supplies, with ammonia able to be used as a fertilizer to make land more productive and as an alternative carbon-free fuel source.

## The right expertise to overcome design challenges

On receiving the original specifications, LTI's expertise was critical as it was able to

identify that the components' design geometrics would have made them extremely difficult to test and meet the necessary regulatory compliance. This was essential, as they needed to withstand immense internal pressures of over 500 bar, whilst also having an elevated working temperature.

In parallel with this challenge was the additional factors of safety, built into the original specified designs, which were beyond the current industry standards normally used. The factor of safety ratio is important as it tests and certifies the load carrying capacity of a structure beyond its, expected or actual, loads during its normal operation. It also ensures a structure is always much stronger than required for its intended load.

In addition, the thickness of the materials used in the original spec would have been much more expensive to manufacture, so LTI needed to reduce this, whilst making sure it was still fit for purpose.

## Operating to industry best practice standards

Working to EN 13445 European pressure vessel standards, which set the minimum required standards in the design, fabrication and inspection of vessels, LTI took the following steps to address these challenges. Following consultation with its client; LTI manufactured a new sphere to replace the original square design, eliminating any

potential weaknesses and eradicating the risk of high fatigue areas occurring within the design.

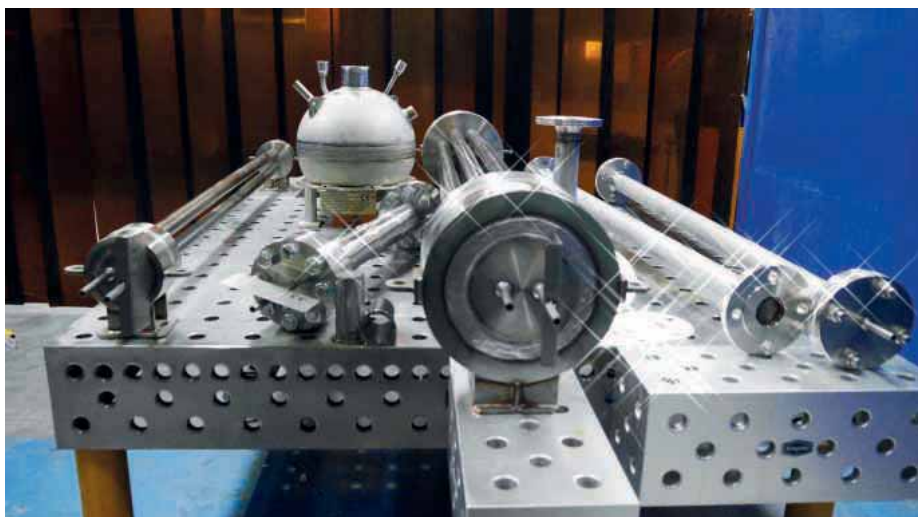
Next, by utilising its experience of pressure and vacuum vessels, LTI was able to investigate how applied stresses could potentially harm the material and design, so they could ensure the necessary factor of safety was built in and the quality, and performance, of the material was maintained. Following reviews of this, LTI was able to fabricate the components from much thinner material than originally specified, making them lighter, more cost-effective to produce and yet completely fit for purpose.

To demonstrate regulatory compliance, components need to undergo 100 percent ultrasonic non-destructive testing; involving the use of high frequency sound waves to locate cracks and other hidden flaws in metals, composites and plastics. However, this was not going to be straightforward due to the original design's geometrics. To overcome this, LTI worked closely with the British Standards Institute (BSI), conducting intermediate testing of various elements during the manufacture, to satisfy the BSI that sound engineering practices were employed throughout and ultimately ensure the regulatory compliance of these components.

LTI also employed optimised welding processes using Metal Inert Gas (MIG) rather than Tungsten Inert Gas (TIG) welding, to help reduce distortion, whilst improving the overall welding speed and weld filler material deposition. MIG welding achieves this as a metal electrode wire is also continuously fed into the weld being made.

By drawing on its track record for innovation in solving customers' engineering challenges, LTI was able to reduce the weight of the original design and therefore avoid extra cost in the process. The company provided its client with a new design that was compliant, stronger and more cost-effective.

**LTI Metaltech**  
**Tel: 01235 827060**  
**Email: [enquiries@lti-metaltech.com](mailto:enquiries@lti-metaltech.com)**  
**[www.lti-metaltech.com](http://www.lti-metaltech.com)**





## Enhanced Tubrod 15.13 multi-purpose welding wire

ESAB has made two significant improvements to its Tubrod 15.13 multi-purpose, all-positional welding wire. The low-temperature Charpy impact toughness is now considerably better and the wire is available in an additional, smaller diameter of 1.0 mm.

TUBROD 15.13 has been a leading rutile cored wire for decades, used for the construction of many of the ships currently sailing our oceans and numerous construction projects around the globe.

Important changes to the composition mean ESAB Tubrod 15.13 now achieves excellent toughness at -40 °C which is a dramatic improvement over the -20 °C prior to the upgrade. The main benefit for users is that many applications can now be welded with just one wire whereas previously it was necessary to change wires to suit different grades of steel plate. Nevertheless, ESAB Tubrod 15.13 still maintains the same impressive array of approvals and classifications, making it suitable for markets as diverse as shipbuilding and general construction. For customers requiring



support for any necessary weld tests and qualifications following the change in specification, ESAB can provide this support as well as advising on process optimisation.

Previously ESAB Tubrod 15.13 was available in wire diameters of 1.2 to 1.6 mm, but ESAB has added a 1.0 mm wire for customers welding thinner plate or seeking a flatter bead profile than can be achieved with the 1.2 mm wire. ESAB Tubrod 15.13 has been a popular choice for many years due to its all-positional capability, self-releasing slag, excellent feedability and all-round ease-of-use, so ESAB has

responded to customer requests for the same specification to be available in a thinner wire.

A premium cored wire that is easy to use in all positions including vertical-up, with or without backing material for root runs, ESAB Tubrod 15.13 is capable of deposition rates as high as 4-5 kg/h. It can be shielded using either Ar/CO<sub>2</sub> or CO<sub>2</sub> to produce a smooth, stable arc with minimal spatter. The new 1.0 mm wire will also benefit users by making it easier to achieve flat weld beads when welding thinner plate sections.

Customers specifying Tubrod 15.13 enjoy access to ESAB's renowned technical expertise. The company's extensive knowledge and experience can be called upon to assist, maximising productivity without compromising quality.

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**Email: info@esab.co.uk**  
**www.esab.com**

## New TR-16A Touch Retract Welding Torch

MacGregor Welding Systems has announced that it now offers the new MACGREGOR TR-16A Touch Retract Welding Torch. It is ideal for the rapid design evaluation of electric vehicle battery pack concepts in research and development settings, low to medium volume battery pack manufacturing, battery pack repair and rework applications. The TR-16A Touch Retract Welding Torch is a great choice for those scaling up from R&D to manufacturing. It offers ease-of-integration and automation.

The TR-16A Touch Retract Torch is a lightweight, handheld tool that allows easy manipulation of battery cans and tab materials in a bench-top, R&D environment. The system can be used with typical prototype tooling. The system has been extensively tested for welding copper, nickel, and aluminium battery tab materials up to a thickness of 0.5 mm onto 18650 and 2170 battery can material.

Compared to traditional resistance welding technologies, the TR-16A Touch Retract Torch can achieve effective welding

of copper with relative ease. Its low voltage operation also offers safety advantages for hand assembly applications compared to many tungsten inert gas (TIG) systems.

At a lower cost than a typical laser system, the system is a more affordable option for low volume battery pack prototyping, racing vehicles, and small to medium scale battery pack rework. The flexible TR-16A enables battery pack concepts to be quickly manufactured and tested. It can also be incorporated into an automated manufacturing line, making the TR-16A appropriate for low to medium volume niche automotive production applications.

MacGregor Welding Systems is part of Amada Miyachi Europe and it combines proven resistance welder and micro arc welder technologies, with a long tradition as the market leader in micro-connection. It is also well-known under its MACGREGOR brand.



MacGregor Welding Systems is at the very forefront of the micro-joining industry and its continuous R&D programme enables the company supply one of the largest choices of micro-welding equipment available anywhere. MacGregor Welding Systems is ISO 9001:2000 approved and the business offers a full design, build and installation service to its customers.

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# Welding for the king

## Tireless harvester makes the grade

Nine years after the purchase of its first power source from welding technology specialists Fronius, the Ponsse means of production now includes 79 of the firm's products. Many of these are the latest generation of the TPS/i power source and it has enabled the renowned Finnish manufacturer, of heavy duty forestry machinery, to further increase the quality of its weld seams, improve productivity and reduce costs.

Rarely is a name so appropriate as the ScorpionKing, one of the world's newest Cut to Length (CTL) timber harvesters. With its eight wheels and three oppositely rotating frame segments, as well as the crane boom, which projects beyond the cab supported on a two-arm column, this machine looks just like an over-sized scorpion. However, Ponsse Plc is less concerned with an impressive appearance of the product and more about its tangible benefits for the machine operator. Unlike excavators or other harvesters, the innovative design means that the crane column is not in front of the cab when in the operating position. As it is mounted on the same slewing ring as the cab, the driver always has a free view of the harvester and the saw unit that cuts down and strips the trunks before cutting them to length. This makes the driver's work essentially easier and improves harvesting quality. It is easier to choose the trees to be

removed, the machine need not be moved from place to place for no reason, and remaining trees are not damaged.

Despite its deceptively open design, the 11 m crane boom with corresponding leverage can effortlessly accommodate the extreme mechanical loads imposed when processing trees weighing several tonnes. The engineers of the Finnish family-owned company designed and exhaustively tested the C50 parallel crane with the greatest care so that it does not threaten the reputation, built over years, of this premium manufacturer of long-lasting reliable and efficient machinery.

For this reason, Ponsse does not outsource the production of the C50. The crane, and all other particularly sensitive parts, and core components, of the forestry machines are made of high-strength steel with a yield strength of 500 MPa. Welding is the essential factor. A vehicle frame requires the company's current workforce of 100 welders, supported by nine robot cells, to produce up to 100 weld seams totalling roughly 300 ms in length. As welding must always take place in the optimal position (PA, PB), the workpieces frequently have to be rotated by a manipulator. This means that the welder regularly has to restart afresh, which means a high proportion of short weld seams.

Joining the C50 also involves extensive



welding work, which is carried out by the combined strengths of people and robots. The two-arm crane column made of cast steel, for example, is welded to the crane boom by a robot. Since this is a critical component of the boom, each weld seam is tested with ultrasound.

In the past these ultrasonic tests repeatedly revealed defects in the manual weld seams caused by a lack of fusion at the start of the weld. This wastes time and is a major cost factor, particularly because the frame requires many manually welded short weld seams, which means many weld starts as well. Every defect means that the affected location must be ground out, re-welded and checked again.

Kari Lehtomaa is the managing director of the Finnish Fronius representative Pronius Oy. He maintains close contact with customers in the region and makes sure he keeps abreast of their preferences and problems. He was therefore very optimistic that the new TPS/i would score highly at Ponsse. Ultimately a particularly reliable weld start is one of the key characteristics of the latest generation of power sources.

In fact, the innovative TPS/i was quickly welcomed by Heikki Selkälä's team, as reported enthusiastically by the production development manager: "Our primary aim was to improve the weld seam quality in our manual welding, which was achieved by switching to the TPS 500i. We quickly





realised that the new generation really is in a class of its own."

However, the reliably deep penetration in all welding phases, including at the start of the weld, is only one benefit. The forestry machine manufacturer also reports significant improvements in the weld seam appearance following the introduction of the TPS/i in conjunction with the Pulse Multi Control (PMC) characteristic.

Minimal spatter tendency and reliable penetration has allowed Ponsse to reduce the time spent on rework by a good 20 percent without any additional measures or training from Fronius.

The welders of Ponsse are also fans of the large touchscreen display of the TPS/i, which makes using the device even easier. The ergonomically designed surface with



plain text display can be used easily with gloves and supports Finnish as an operating language.

The number of machines purchased is testament to how much Ponsse values the new devices. In six months the company has bought and commissioned an impressive 63 machines from the TPS/i range for manual and robot welding.

After the arrival of another manual welding device from the TransSteel series, those responsible at Ponsse embarked upon the collection and analysis of detailed figures about the reliability of the Fronius devices and the costs of consumables in preparation for future investment decision-making. The figures were all very positive. Machine breakdowns are extremely rare and gas nozzle consumption for instance fell by almost 100 percent compared to predecessor machines from a different big-name manufacturer. Similarly, positive was the trend with contact tips. Before changing to Fronius devices, the welders at Ponsse had to replace the contact tips up to 30 times a day due to ignition problems. Now they last up to a week or more.



In the future, Ponsse intends to look more closely at the status of welding systems and welding processes. It will use the status and weld seam information it collects to carry out ongoing monitoring, analysis and documentation of its welding processes. With the help of a central server unit (WeldCube), it will also soon be possible to collate and manage the data from several power sources from throughout the company.

**Fronius UK Ltd**  
**Tel: 01908 512300**  
**Email: info-uk@fronius.com**  
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## Cost-effective anti-spatter

Although good practice can reduce weld spatter, by and large it is a fact of life. Many welders don't have access to the latest technology in welding equipment to eliminate the problem and it's here where Henkel is really making a difference. The company, whose brands include LOCTITE®, TEROSON® and BONDERITE®, has developed a range of simple, spray-on anti-weld spatter agents and the latest addition is BONDERITE S-MA 98.

This water-based surface treatment product, part of Henkel's functional coatings range, is already helping manufacturers decrease cleaning time, material wastage and improve worker safety. Extensively used in automotive manufacturing, and now available to the production industry at large, BONDERITE S-MA 98 is a colourless liquid that is applied directly to the body-in-white panel or workpiece.

Supplied in 25 litre quantities, BONDERITE S-MA 98 can be applied by hand or via a TEROSON pump spray bottle, designed for accurate dispensing of industrial liquids from bulk containers. It

provides an infinitely adjustable spray pattern and holds one litre. The product is easily removed in the alkaline cleaning stage of the conversion coating process or can simply be rinsed off with water.

For more information on Henkel anti-spatter products go to **www.bonderite-solutions.co.uk**

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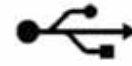
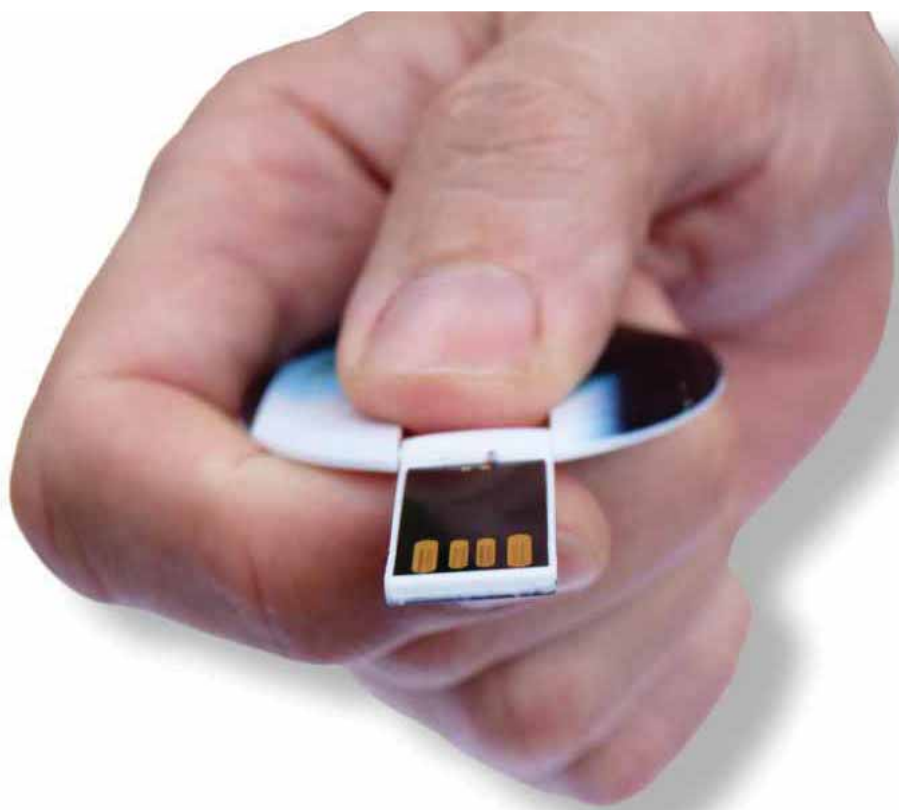
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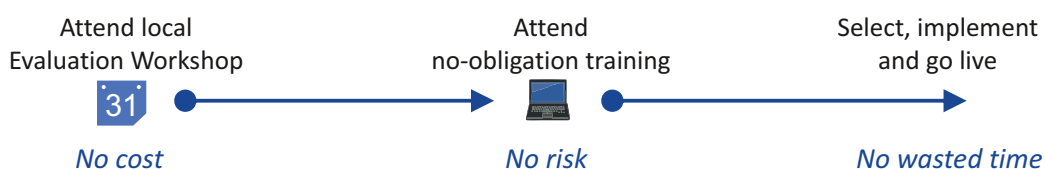
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