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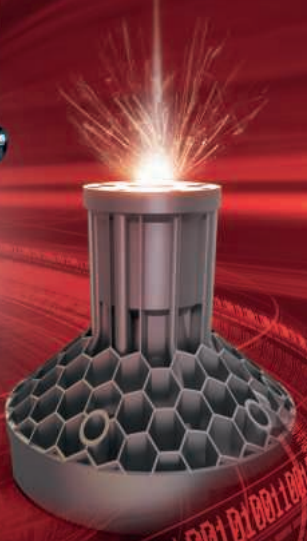

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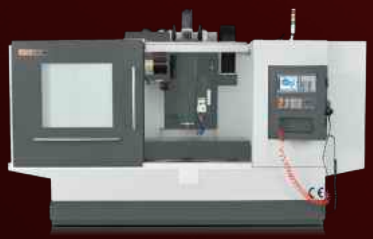

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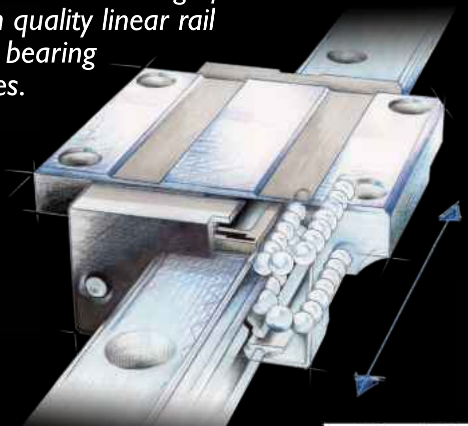

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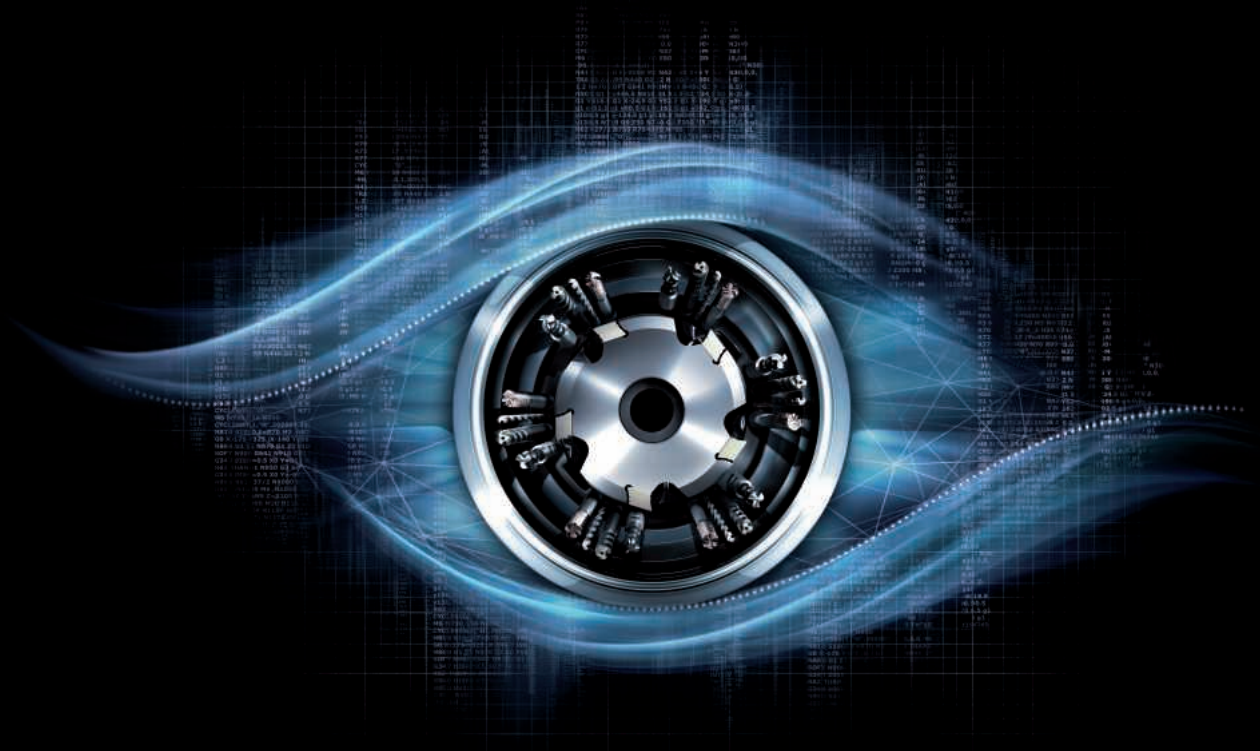

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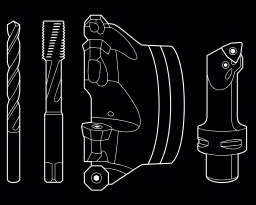

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DMG MORI to demonstrate the future of production technology

On an exhibition area of approximately 10,000 square metres, DMG MORI will be showcasing around 80 high-tech machines at EMO 2017 to demonstrate its latest innovations and integral technology solutions right through to the digital factory.

The key topic for DMG MORI at EMO is the "path of digitisation" with which the company smooths the way to the future of the "digital factory" for its customers worldwide. The supporting pillars of success here include the APP-based CELOS® control and operating system, the DMG MORI technology cycles and customised software solutions for maximum efficiency in digital production. In line with this the company will also be demonstrating the diversity of the automation solutions in the new unmistakable VERTICO design. DMG MORI will be presenting around half of the machines on show with automation.

With a fully digitalised process chain, DMG MORI will be presenting its future technologies in the field of additive manufacturing at the exhibition. Its offer of both laser deposition welding with a powder nozzle (Laser Metal Deposition) and selective laser melting in a powder bed (SLM), means the company has bundled together the most important generative production processes for metallic materials under one roof.

From the "product to the process" is the slogan of the EMO branch solutions at the DMG MORI technology excellence centre. By integrating customers in the joint process development at a very early stage, DMG MORI offers customised technical turnkey solutions in the aerospace, automotive, die & mould and medical sectors. DMG MORI will once again demonstrate its innovative strength with eight world premieres from the technological fields of turning and milling. The latest CTX 2500 | 700 universal turning centre is the prelude to the fifth generation of this successful series, while the CLX 550 enlarges the range of basic turning machines. With the NTX 2500 DMG MORI expands its portfolio in turn-mill machining. In addition, the third generation CTV 250 plus the MULTISPRINT 25 and MULTISPRINT 36 multi-spindle automatic lathes stand as examples of automated performance for more efficiency in serial production. The DMU 340 Gantry and DMU 200 Gantry 5-axis universal machines round off the world premieres as two new additions to the XXL range.

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Report reveals SME manufacturers in the UK are solving the 'productivity puzzle'

Small to medium-sized manufacturers in the UK appear to be getting to grips with the 'productivity puzzle', according to a new report out today.

More than 52 percent, of the 270 SMEs questioned in the National Manufacturing Barometer say they have increased productivity over the last six months, with 68 percent expecting another performance boost between now and the end of the year.

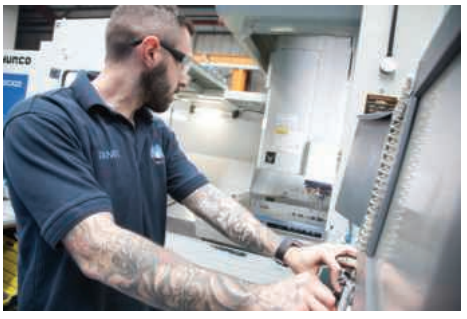
The survey, conducted by SWMAS Group, part of the Exelin Group, in partnership with Economic Growth Solutions (EGS), also revealed renewed optimism amongst firms, with 61 percent recording an increase in turnover, four percent up on the previous quarter and 13 percent up on the same period last year.

There was also a seven percent rise in the number of manufacturers that have recruited to 44 percent, whilst investment in machinery and new technology has remained the same.

Simon Howes, managing director of Exelin Group, says: "Productivity never seems to be out of the media spotlight at the moment, so it is pleasing to see that SMEs are showing signs of bridging the gap, perhaps showing the larger firms how it is done.

"52 percent of respondents tell us they have either achieved an increase or significant increase over the last six months and this may be contributing to the upbeat sales and recruitment figures we are also seeing.

"The National Manufacturing Barometer is painting a positive picture yet again, defying early rumours of a slowdown in UK manufacturing. Don't get me wrong, there are challenges on the horizon and we still



need to fully see how the Brexit negotiations are going to play out.

"However, what manufacturers are telling us is that they are not sitting back and seeing what might happen, they're out there fighting to win new work, creating new jobs and finding answers to the productivity puzzle."

Productivity was the special focus of this quarter's National Barometer, with companies also asked to outline some of the key challenges they face when looking to solve the 'puzzle'.

54 percent of SMEs cited skills and expertise as the biggest hurdle holding them back, while exactly half said workforce efficiencies. Available machinery and supply chain efficiency were viewed as other difficult areas preventing them increasing performance.

Companies were also asked about barriers to employing new talent, which unsurprisingly was topped by 'lack of industry specific skills', 'geographical location' and 'pressure of paying higher salaries'.

Lorraine Holmes, CEO of Economic Growth Solutions and the Manufacturing Growth Programme (MGP), adds her support: "This is another encouraging set of findings that ultimately shows SMEs are still confident about current and future economic conditions.

"Both EGS and SWMAS are continuing to work together to help companies address issues that can unlock improved productivity and increased sales, including assistance with leadership and management, lean manufacturing, strategy and sales and marketing."

The Manufacturing Barometer is a quarterly survey that charts the experiences of English SME manufacturers. It is the largest survey of its kind and has informed both government industrial strategy and the national debate on manufacturing. It regularly features in both national and regional media.

Run by SWMAS since 2009 in the South West of England, the Manufacturing Barometer records trends in employment, turnover and investment. Each quarter, a 'special focus' explores an issue in greater depth. In the past, this has included issues such as productivity, overseas production and energy efficiency.

The Prime Minister referenced statistics from the focus on overseas production in a speech he made to the World Economic Forum at Davos in 2014 to mark the launch of 'Reshore UK'. This programme supports English Manufacturers who wish to bring production back from abroad.

Since 2012, the Manufacturing Barometer has covered the whole of England, and produced a report in partnership with the Manufacturing Advisory Service, now part of the Business Growth Service. Companies are able to use this to compare themselves against other firms within their sector or region. To obtain a copy of the National Barometer, email info@swmas.co.uk.

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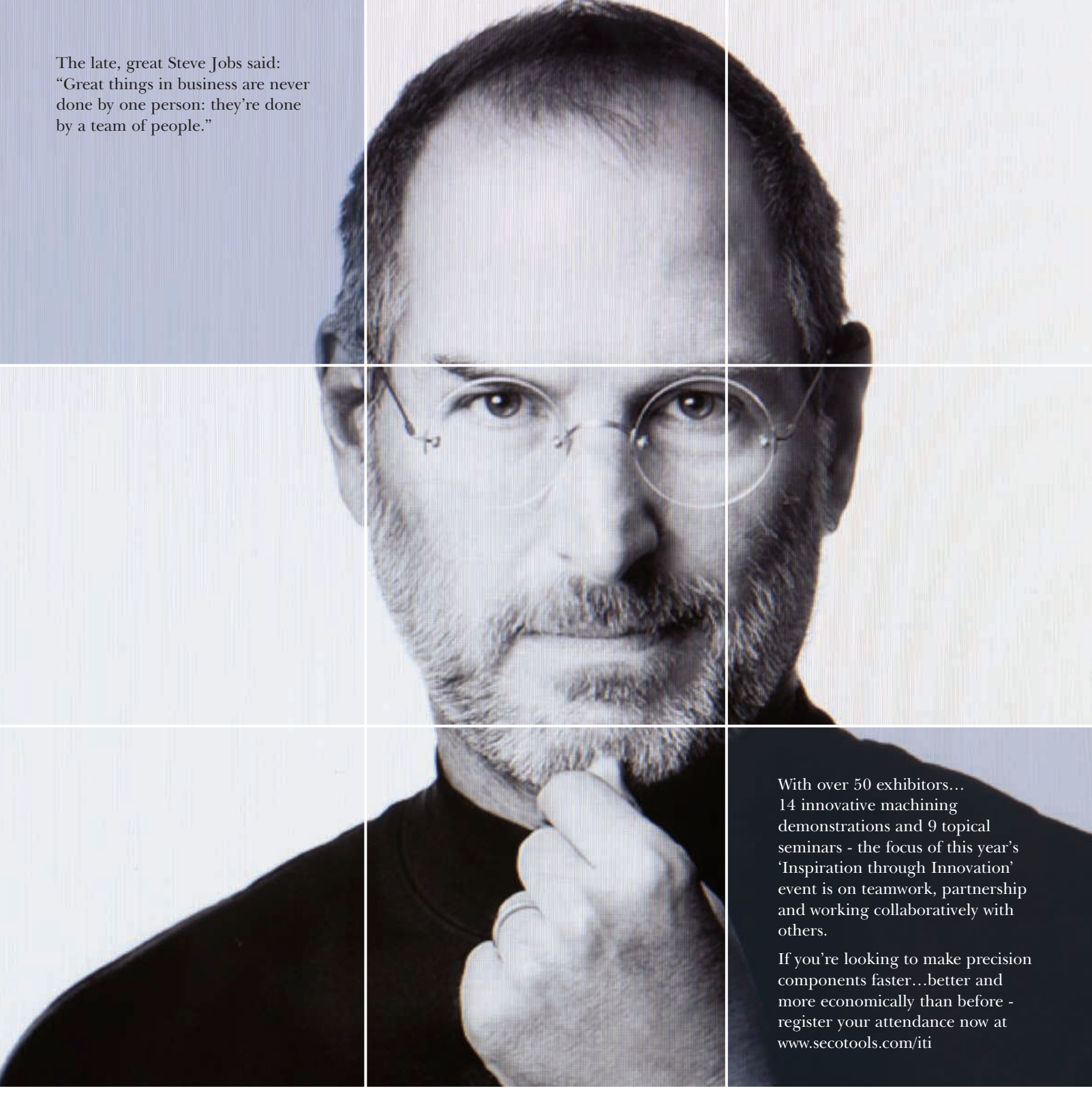

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The home of intelligent production

Already regarded as the leading engineering exhibition in the world, EMO 2017 promises to be the place to discover the latest developments in digitisation and connectivity, with a special focus on Industry 4.0.

At the beginning of June 2017, more than 2,050 firms from 45 countries had signed up, with more than 1,400 exhibitors from Europe alone, while the number of Asian participants has increased from 21 to 25 percent.

With its motto of Connecting systems for intelligent production, it will be spotlighting the issues of digitisation and networking for production operations.

In a consistently networked manufacturing line, flexible production is possible with optimised sequences, so that even rush orders in small batch sizes can be handled. Complete networking of the entire production line with real-time communication and control will create maximised added value for companies when it implements horizontal communication from receipt of the order all the way through to dispatch. Within the added-value chain, moreover, it's important to network not only the component suppliers, but also the logistical partners and the customers involved, in order to achieve maximised productivity, flexibility and efficiency.

Of course, it's not all about Industry 4.0. The world's premier trade fair for the metalworking industry will be showcasing the entire bandwidth of today's most sophisticated metalworking technology, which is the heart of every industrial production process. The fair will be present the latest machines, plus efficient technical solutions, product-supportive services, sustainability in the production process, and much, much more.

The trade visitors to EMO come from all major sectors of industry, such as machinery and plant manufacturers, the automotive industry and its component suppliers, the aerospace sector, precision mechanics and optics, shipbuilding, medical technology, tool and die manufacture, steel and lightweight construction. EMO Hannover is the world's most important international meeting point for production technology specialists from all over the planet. In 2013, the fair attracted more than 2,130 exhibitors, and around 143,000 trade visitors from more than 100 different countries.

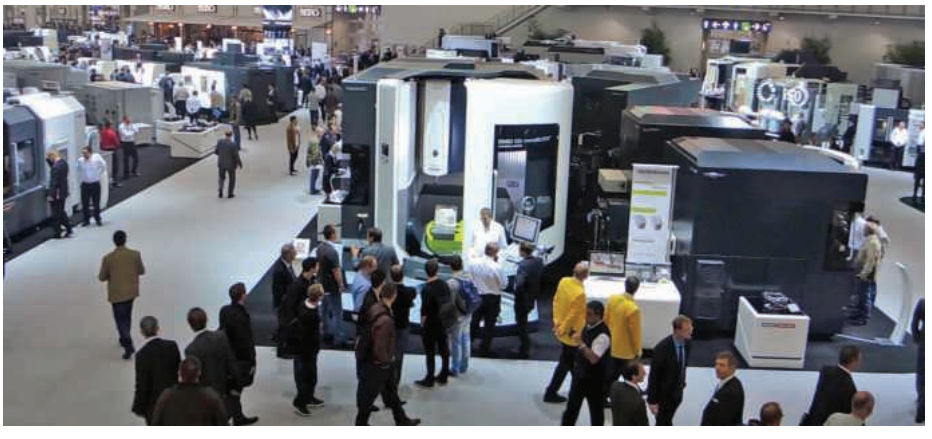
Additive technologies will also be highlighted strongly at EMO. The whole world is talking about 3D printing, additive manufacturing and generative multi-layer construction technologies. Nevertheless, this is a long way from meaning that the classical machine tool is going to be pensioned off. The EMO Hannover 2017 will be showcasing an international plethora of production technology, with alternative processes very much as the icing on the cake.

A "new solution for additive manufacturing" has recently been premiered by Siemens PLM Software, the Business Unit for Product Lifecycle Management (PLM), Cologne. It consists of an integrated software package for design, simulation, digital manufacturing, plus data and process management. This enables a "generative design to be created automatically, with new functions for optimised topologies". This frequently results in organic shapes that a design engineer would be highly unlikely to think of himself, and that would be very complicated or even impossible to manufacture using conventional production methods. Possible user target groups include the automotive industry, the aviation sector or medical technology.

In addition, within the framework of this strategy, Siemens PLM Software has unveiled plans for a new online collaboration platform providing an option for worldwide cooperation in the manufacturing sector. The declared aim is to render "on-demand product designs" and 3D printing production operations more easily accessible to a global manufacturing industry. In mass production environments," says Peter Scheller, "3D printing has not yet arrived completely. It originated in prototyping and so far has been predominantly used for this purpose, but we're approaching a threshold here.The process is emerging from this niche, with many companies currently thinking about using it for mass production or have already introduced it for this purpose.

"When you think about an additive production process on an industrial scale, from our point of view, a process-reliable data format is extremely important, as a basis for enabling components to be dependably manufactured again and again in the same quality. So far there hadn't been a platform of this kind, which is why we're now providing one for our customers."

A number of discussions and seminars on additive manufacturing will be presented at EMO. Information and registration details can be found at: **www.emo-hannover.de/Konferenzen**



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Mazak

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It's all about industry 4.0

The Internet of Things

At EMO 2017 Mazak will turn Industry 4.0 from a revolutionary concept into a production reality.

25 machines, many making their world debuts, will be connected using Mazak's robust Industry 4.0 infrastructure - centred around SMOOTH Technology, Smartbox security and the MT Connect standard communication protocol.

Mazak will demonstrate how you can create the connected factories of the future - iSmart Factories!

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It's all about you

GROB to showcase its enhanced electric mobility portfolio

GROB-WERKE will be showcasing technology innovations and three new machine generations over an area of 1,700 m² at EMO. GROB's highlights at the trade show will fully reflect the motto of EMO 2017: "Connecting systems for intelligent production". The company's innovations in the universal machine sector include the next development stage of the G-module series, with and without pallet changer, and the new GROB rotary storage system for the G350 and G550 Generation 2 machines. GROB will also be introducing a new gantry concept for system machines, a machine concept for machining chassis and structural parts, a new, forward-looking operating concept and a new version of GROB's production software GROB-NET4Industry. GROB's stand at the trade show will be packed full of surprises and visitors will also be able to find out about the company's global service offering and new financing concept.

A successful decade of universal machines

A G350 with a horizontal spindle position was unveiled for the first time at EMO back in 2007. Today, ten years later, the 5-axis universal machining centre is a market success and has also helped establish 5-axis technology across the global mechanical engineering sector. Highlighting the latest developments on the universal machine front, GROB will be presenting live chipping demos with market-proven, next-generation machine concepts.

With a host of options available including milling and turning technology, an optional pallet changer, a rotary pallet storage system, automation and a new operating panel, the 5-axis universal machining centres can be flexibly adapted and expanded for every application. The G350 and G550 - Generation 2 machines with the GROB rotary pallet storage system, and the latest generation G350T with milling and turning technology, will be further highlights at the show.

Double-spindle machines with an integrated pallet changer

A double-spindle G-module with an integrated pallet changer and two motor spindles with a cross-feed device are core elements of a GROB solution that will be a particular highlight for current and potential customers with medium to high volume requirements. Originally the result of individual developments, these two components deliver optimum productivity and have been combined to create one harmonious concept. As always, this is based on the kinematic design of the dual-spindle G-module with the vertical axis located on the workpiece side, a concept that has proven itself over many years.

Innovation for large structural parts

GROB-WERKE will also be unveiling the new G500F/G600F and G520F F series, the first machines of this kind worldwide in single- and double-spindle versions for machining large structural parts. Visitors to the trade show will also have the chance to see the new G600F machine concept.

GROB service concept

The company has restructured its service area in order to respond even more efficiently to customer queries in future. A dedicated online shop known as "GROB4Care" was developed as part of this restructuring. Customers can use the shop to purchase spare parts quickly and easily at any time, regardless of actual business hours. The automotive segment is also being expanded in response to the rising importance of retrofitting, a trend that is being fueled by uncertainties regarding the future of the automotive market.

Electric mobility by GROB for the automotive industry

GROB will also be presenting its enhanced portfolio for its new electric mobility business segment at EMO. GROB has expanded its existing know-how on electric mobility through the acquisition of the Italian company DMG meccanica, a leading machinery and plant manufacturer for electric motors. This move has enabled GROB to become a highly competent service provider and contact partner for the automotive sector. GROB maintains direct dialog with the industry in order to develop projects, technologies and innovations in this new business field. At EMO, GROB will show visitors how it is the right partner to act as a general contractor for further major projects focusing on complete powertrains for hybrid and fully electric drives. And, above all, why GROB offers machines and systems for electric powertrains and how it can reliably manufacture these for series production in future.

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Focusing on electric drive systems and the "smart factory"

Electromobility and Industry 4.0, two industrial megatrends, will feature prominently in the EMAG Group booth at EMO. Throughout the show, EMAG machine manufacturers will demonstrate their role as "facilitators" of technological change. For example, they have complete solutions available for the efficient production of central components of electric drive systems. Exhibition visitors will see several high-performance machines in operation, including world-firsts in the areas of turning operation, laser welding/joining and gear cutting. At the same time, the EMAG Group is also accelerating the digitalisation of its production technology to establish intelligent factories. Therefore, EMO will have a dedicated area where customers can test essential Industry 4.0 solutions. A main focus is the consistent usability of the software, which will continue to simplify the control, monitoring and analysis of production.

The goal is a controlled, predictable and monitored production process from start to finish. This summarises the message of EMAG's Industry 4.0 presence at EMO. The manufacturing data of the machines offers many options for perfecting central processes with custom-fit software tools. "MultiMachineMonitor", for example, enables the control of different machines from a central location by tablet or PC, and fine-tuning of the production process. The "EC Data" software guarantees the traceability of the production process of a workpiece at any time. "MachineStatus" provides a detailed analysis of the machine and the tools during operation.

Promoting the e-revolution in production

Another key focus at EMO also points to the future of industry as EMAG solutions allow for the efficient production of many components for hybrid or purely electric drive systems, from rotors and complex differentials to new types of transmission shafts. This process covers from raw part, all the way up to the final precision machining. The wide range of technology within the Group makes this all possible and the capability broad range is demonstrated by the machines that EMAG is displaying at the show. For example, the enhanced dual-spindle VL 3 DUO vertical turning centre is a highly productive solution for gear and engine components up to 150 mim in diameter. It only requires a minimum installation space of 24.5 sm, including automation system (TrackMotion), chip conveyor and parts storage.

Increased productivity is provided by two entirely separate machining areas with powerful water-cooled motor spindles up to 32.4 kW power, at 40 percent duty cycle and 12-post tool turrets. The matching TrackMotion automation system not only ensures the rapid transportation of parts between the two machining areas, but also flips the parts over between OP 10 and OP 20. The results of this process are a minimisation of cycle times, and a significant decrease in unit costs. At the same time, direct distance measuring systems and recirculating roller guide rails in all linear axes ensure precision and consistent workpiece qualities.

Of similar interest is the world premiere of the VLC 50 TWIN turning centre for gear components with a diameter of up to 75 m. It has two main spindles in one machining area that are able to process two identical workpieces simultaneously. This results in a massive increase of output quantities and lower unit costs. Diameter and length of the two workpieces can be adjusted independently by the two spindles. This machine equally has direct distance measuring systems and recirculating roller guide rails.

New degree of flexibility in joining and laser welding

Another world first is the introduction of the ELC 160 HP production solution. This machine is used especially for processing the control gear and clutch body, and combines several process steps into a perfectly timed system: Joining, press fitting, of the clutch body, induction pre-heating, if required by the material, and connecting the components with a laser beam. Cycle times in some instances are less than 10 seconds because the processes run parallel in four different stations. Furthermore, the ELC 160 HP allows automatic retooling of the fixtures for different gear stages. Due to this feature, the complete set of wheels for a gear can be produced in a one-piece flow, without retooling.

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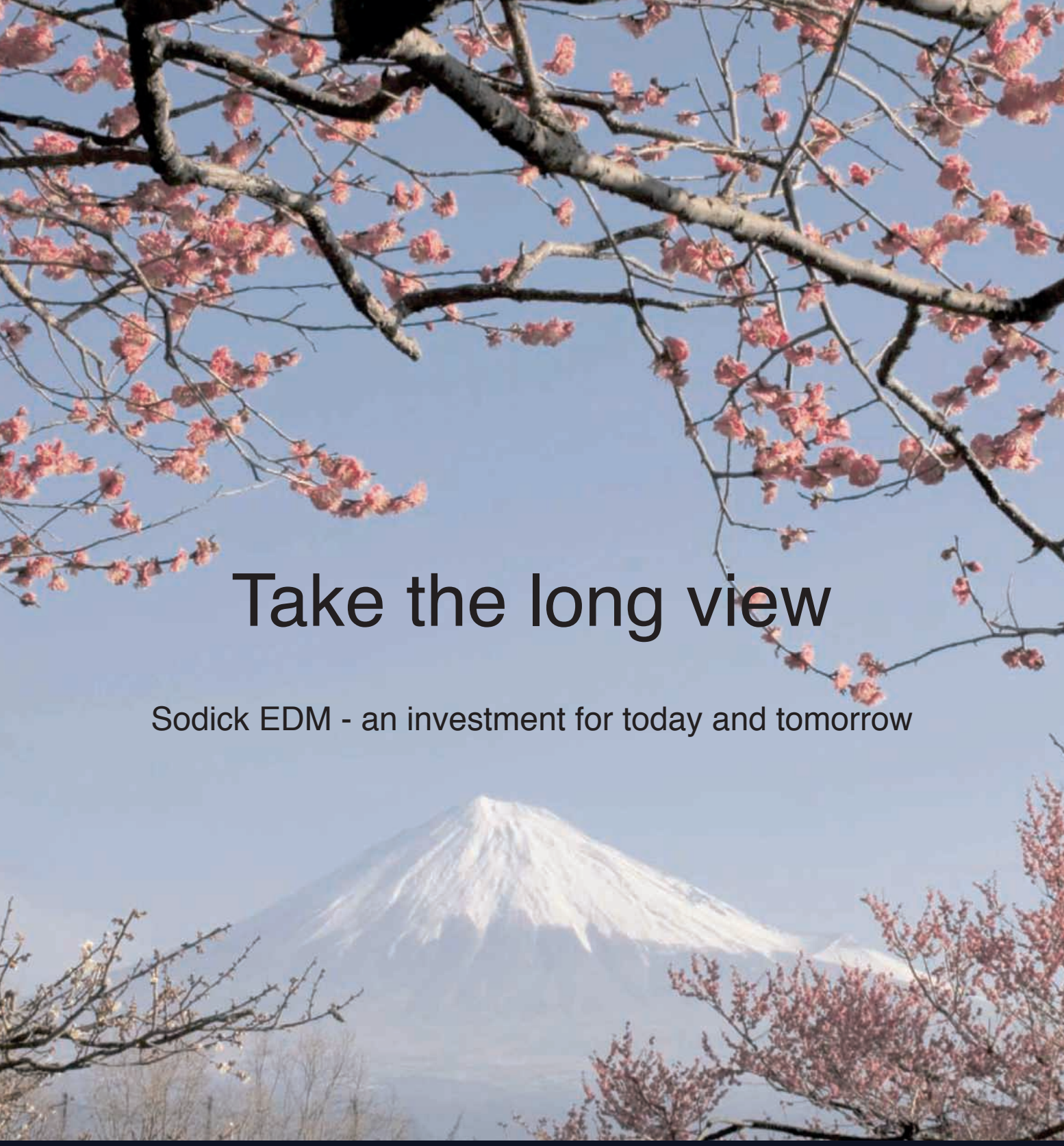

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Mazak to unveil full Industry 4.0 solution at EMO

Industry 4.0 will be placed at the centre of Yamazaki Mazak's EMO 2017 stand with the unveiling of the company's iSmart factory concept along with 25 new machines, including 15 making world debuts.
The iSmart factory concept utilises Mazak's Industry 4.0 infrastructure which enables machine users to make the vital step-up from automated cell manufacturing to a completely connected Industry 4.0 factory of the future.

Mazak's iSmart Factory is centred on three key pillars, namely SMOOTH Technology, the new SmartBox, which provides faster data analysis with increased security; and the MT Connect standard communication protocol. All elements combine to facilitate the real-time sharing of manufacturing data between the production floor and offices, ultimately resulting in shorter lead times, reduced in-process inventory and lower indirect labour expenses for manufacturers.

SMOOTH Technology, incorporating the world's fastest CNC and smooth process support factory management software, sits at the heart of Mazak's Industry 4.0 infrastructure, due to its ability to reduce machining by 30 percent, connect entire machine shops and provide real-time monitoring and analysis capability.

In addition to the SMOOTH process support modules, such as SMOOTH scheduler and SMOOTH PMC, the CNC has also been equipped with a number of new programmes which will be launched at EMO 2017. The first is Mazak API (Application Programming Interface) which enables non-Mazak software, such as automation equipment, to be integrated into the full suite of SMOOTH CNC's. Alongside this is the new smooth spindle analytics software, which provides instant spindle vibration reporting and analysis.

Efficient and secure data processing is made possible by Mazak's new SmartBox. Utilising Cisco's FOG computing concept, the SmartBox effectively extends cloud computing closer to where the data is produced. This enables sensitive data to be analysed and acted upon securely with optimal speed, with only selected data sent to the cloud for historical analysis and long-term storage. Cybersecurity is maximised by a state-of-the-art Cisco networking platform and Layer3 Managed Switch, industrialised for the factory environment. The SmartBox can interface with any machine fitted with an MT Connect adaptor regardless of manufacturer, age or CNC type. Older legacy machines can also be connected to the SmartBox with the addition of Mazak's new SensorBox.

The final pillar of Mazak's iSmart Factory concept is the use of the MT Connect standard communication protocol, which allows the cross-communication of multiple different machines in the factory or workshop, and enables machine information to be extracted in a standardised format.

During the exhibition, each of Mazak's 25 machines, configured into six different machining zones, will be connected using the company's Industry 4.0 infrastructure to display real-time production information.

Taking centre stage in the Multi-Tasking zone is the latest extension to Mazak's flagship INTEGREX range. The INTEGREX i-500 extends the capacity of the successful i-series and features a modular design concept, enabling customers to match the required machine specification to their application. The INTEGREX i-500 will be joined by another machine shown for the first time, the INTEGREX i-800V/8, which combines full 5-axis milling, powerful turning operations and pallet-changing capabilities to quickly process large, highly complex parts, such as jet engine components on a vertical platform. Both machines are making world debuts at EMO 2017, and will be operating on Mazak's SmoothX CNC, with stand visitors able to witness the level of productivity that can

stem from full integration into the iSmart Factory concept.

Mazak's 5-axis Zone will be centred on three exceptional new machines. The new HCR-5000S, which is making its world debut, is a compact high performance horizontal machining centre ideally suited to the aerospace sector for the manufacture of small-size structural components. The machine is equipped with a high performance main spindle and is capable of ultra-fast acceleration with excellent jerk control, to deliver highly accurate finished parts.

Alongside, in the 5-axis Zone, the VARIAXIS i-300 AWC is a compact automation solution developed from Mazak's highly successful VARIAXIS range combined with automation knowhow from their PALLETECH solutions. The machine incorporates a gantry-box structure to delivery high accuracy and an expandable tool magazine of up to 505 tools, making it ideal for high mix, low volume production and lights out machining. The 5-axis Zone also includes a brand new specialist die and mould machine, the UD-400/5X, which is capable of 42,000 rpm, 1.0 G acceleration and an ultra-high jerk rate.

In the Horizontal Zone, amongst the stand-out machines is the HCN-5000, equipped with an MPP500 automation system. The 16 station MPP, which stands for Multi Pallet Pool, is designed to add automation to single machines. It features the SMOOTH MPP software application with advanced scheduling functions, analysis of production results and system utilisation which can also be accessed remotely on PCs and smart phones. The space saving design occupies a smaller footprint than the traditional PALLETECH system and is ideal for long periods of unmanned running.

One of the highlights in the Turning Zone will be Mazak's QUICK TURN 250M. With an automated robot system, seamlessly integrated with Mazak's SmoothG CNC, it enables complete control of the manufacturing cell from the CNC, as well as real-time data sharing and analysis with the wider factory. The easy-to-programme robot cell enables a flexible, high productivity automated solution, ideal for small to medium lots sizes, suitable for a range of applications.

In the Vertical Machining Zone, the highlight is the UK-produced VCN-530C, which is equipped with a newly designed 18,000 rpm high-speed spindle, ballscrew cooling on the X-, Y- and Z-axes and a high capacity 40-tool magazine. The machine is specifically targeted at the subcontracting market.

The final highlight for visitors to the Mazak stand will be a first European showing of its latest additive manufacturing machine tool, the VARIAXIS j-600AM. It is the latest addition to Mazak's growing additive portfolio available to customers in the European market, and the VARIAXIS j-600AM employs an innovative Wire Arc-type metal deposition system to take the additive process to an as yet unseen level of speed. It enables manufacturers to quickly and easily grow part features, and then employ the machine's advanced 5-axis multi-surface subtractive capabilities to produce high-precision parts complete in single setups.

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Hall 27, Stand B56

ETG partners out in style

Key partners of the Wellesbourne based Engineering Technology Group (ETG) will be much in evidence at the EMO exhibition. An early snapshot of machines and workholding products that will be featured for the first time reveals new innovations from Chiron, Nakamura-Tome and Hardinge Bridgeport.

ETG personnel from the UK will be present at the exhibition supporting their partners on the stands and will be available to discuss the latest trends and machines that, in many cases, can become the cornerstone of turnkey and high productivity installations. Moving forward, turnkey is a major business area for ETG and one where its project engineering teams bring together machines, automation, controls and software technology to create increasingly highly effective manufacturing solutions.

Nakamura-Tome (**Hall17, Stand B40)** has two brand new introductions with its SC300II multi-tasking machining centre and the heavy duty NTY3-150 GR203 High Speed machine with gantry.

The SC300II is a complete redesign of the earlier SC300 machine, not just a cosmetic make over. Featuring a totally re-configured bed casting and offering much higher cutting capabilities, the machine is a true heavyweight, offering a big bore, powerful cuts and a 10" capacity chuck.

Key features include a massive 45° slant bed for maximum rigidity, a 22/18.5 kW wide range motor for powerful cuts, quicker 'non-lift' turret indexing to reduce idle time, a 71 mm diameter standard bar capacity, and an all Fanuc CNC control and servo drive package with dodecagonal 12 station turret.

The NTY3-150 GR203 High Speed is the new, bigger size NTY3-150 multi-tasking machining centre but now equipped with a completely upgraded design gantry system. Nakamura claims that the new GR203 High Speed is currently the fastest standard fit gantry system on the market and will be demonstrating its full capabilities at EMO.

Key features of the NTY3-150 are the opposed twin-spindle, 3-turret construction, 72 capacity tool station, 36 driven tool stations and a 15/11kW + 11/7.5kW L/R spindle motor with 5.5/3.7kWx3 driven-tool motor (upper/lower).

Chiron Werke (**Hall12, Stand CO4**) also has an emphasis on speed with its new 'DZ08FX Precision' 5-axis machine, described by the manufacturer as 'probably the fastest twin-spindle 5-axis machine in the world'.

Its high-dynamic package is based on a new drive concept which, among other features, offers a change from ball screws to non-contact electromagnetic linear guides in the X/Y/Z axes, increasing the maximum speed gain factor and ensuring a noticeable increase in dynamics.

As a result, surface and control precision increases, workpieces can also be machined with a higher path velocity, structural components are optimised and machine rigidity has increased. Dynamic torque drives are used on the A and C axes

Productivity gains are also dramatic; on production tests manufacturing aluminum impellers of different sizes, cycle time reductions of between 20 and 51 percent along with improved machining accuracy were recorded.

The high performance 'Precision' centres are also suited to loading and unloading in parallel with manufacturing processes using the fully automated Chiron 'Variocell' handling robot.

At EMO Chiron will be maintaining its focus on multi-machine systems and turnkey solutions for unmanned production in various industries.

Its common automation solution "Variocell" is based on the Variocell Uno compact robot cell is used for the automation of machining centres. This brings together handling robot and a workpiece storage unit with space for twelve pallets all on a floor space of less than one square metre. The solution can be expanded by a variety of equipment options or can be individually adapted to the needs of production in the "Variocell System" version.

Hardinge Bridgeport (**Hall 17, Stand 55**) is also using the EMO opportunity to highlight new and recent additions to its portfolio. Prominently featured will be the Talent P high performance turning centres, a new range due for imminent launch in the UK, and the Bridgeport XT travelling beam vertical machining centres.

The Talent series machines currently offer two structures (for short and standard lengths) built on a robust one-piece cast iron base with heavy duty roller linear guideways and ball screws.

As standard the machines are supplied with ANSI configured Collet Ready spindles available in a choice of 42 or 51 mm capacities.

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Sodick shows the latest EDM technology at EMO

Confirming its position as developer and manufacturer of the world's most advanced EDM systems, Sodick will be demonstrating the very latest technology at EMO 2017. Machines on the stand will include no less than four wire EDM machines; with two brand-new models, the ALC800G and VL600QH, as well as a Premium ALC600L. Sodick's extensive die-sinker EDM range will also be represented by an automation-ready AG60L equipped with a robot, as well as one of its highly successful entry-level AD55L machines. In addition, the company will be demonstrating its unique, ground-breaking 3D metal additive manufacturing machine, with integral milling capability, the OPM250L, which continues to draw crowds wherever it appears.

The newly announced ALC800G, incorporates all the features and benefits of Sodick's Premium wire range, as well as offering a three-sided automatic opening door and generous work tank with inner dimensions of 1,500 mm (X) by 1,040 mm (Y). The high-column option version of the machine also provides an extended Z-stoke of 800 mm.

Meanwhile, the new VL600QH, which incorporates an extended Z-stroke of 500 mm, making it suitable for tackling even taller workpieces, is a development of the VL600Q linear motor driven wire-cut EDM, which has proved to be extremely successful since its debut at EMO Milan in 2015. The new machine retains all the features and benefits of the earlier model, including the FJ-type Automatic Wire Threader with "pop-up" function to enable reliable automatic wire threading.

The ALC600G wire EDM machine incorporates all the company's latest digital innovations, resulting in a machine capable of increased cutting speed, greater accuracy and improved surface finish. These achievements are the result of Sodick's many years' experience in developing linear motor technology, including the incorporation in the ALC600G of the Smart Pulse Generator, which dramatically reduces the number of cuts necessary to achieve the required accuracy and surface finish, when compared to conventional machines.

The best-selling AG60L Die-Sink with Robot, which incorporates Sodick's linear EDM technology, has been installed on shop-floors and in tool-rooms around the world in sectors including automotive, aerospace, medical and pharmaceutical. The three-sided automatic rise and fall work-tank makes the machine ideally suited for automation, hence its appearance at EMO with a robot.

Making world-leading EDM technology available to entry-level participants, the AD55L incorporates a plethora of leading Sodick innovations, including linear motors on X, Y, and Z axes, as well as the K-SMC Sodick Motion controller, 1Gbit/sec communication technology, SGF nano-wear generator and ceramic work-zone, ensuring a superior level of performance compared to other entry-level EDM machines. In addition, the symmetrical structure of the AD55L has been specifically designed to provide improved rigidity in order to maximise machine performance.

Sodick's unique metal 3D additive manufacturing machine with integral linear motor drive milling centre represents the industry's first one-step solution for the entire metal 3D additive manufacturing process. The OPM250L is ideally suited for applications in sectors including aerospace, automotive, defence and pharmaceutical. Recent developments include the new "function parallel" mode, which enables simultaneous laser sintering of multiple locations by controlling a single laser at high speed.

The OPM250L operates as follows: first, a metal powder is uniformly spread and then melted and solidified by scanning with a laser beam (this process can be repeated up to ten times) after which the surface is subjected to high speed milling process, creating the high quality, accuracy, precision and finish which are not achievable with a laser process alone, after which the metal powder is uniformly coated again and the process is repeated, until the geometry is complete.

In addition, the combination of a linear motor drive system with the machine's gantry structure ensures excellent positioning and machining accuracy by taking full advantage of backlash-free, rapid axis movement while minimizing any deformation of the machine structure, while the dielectric chiller and surface level adjustment function ensure stable machining performance right from the very start.

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Hall 13, Stand A86

New cross table deep hole drilling machine

Single machine for economic deep hole drilling, milling and tapping at EMO

During this year's EMO in Hannover, the German-based company TIBO Tiefbohrtechnik GmbH will showcase its new type KTE40-1000 cross table deep hole drilling machine. Tibo's previous supply range covered single and multi-spindle deep hole drilling machines for round components.

The range of the Swabian machine maker is now complemented by the type KTE machine series, which is suitable for deep hole drilling in cubical components. Applications for the KTE series include the tool and mould making industries, where deep hole drilling is performed to create coolant passages in the tools. The KTE40-1000 cross table deep hole drilling machine allows for cooling channels with a diameter between 2 and 40 mm to be drilled at a depth of 1,000 mm and beyond.

Required closing threads can also be created quickly and reliably, using the milling and tapping kit. When it comes to control technology, TIBO, as always, chose components of high quality, equipping the

KTE series with the latest CNC control equipment 840d sl by Siemens. The clamping table features a travel path of 800 mm for the X-axis and 350 mm for the Y-axis as well as a load bearing capacity of at least 3,500 kg.

The modular system that is familiar from TIBO's single fluted and BTA deep hole drilling machines also allows for other combinations of drilling range, drilling depth and table size. The large universal clamping table with precision lifting elements and direct position sensors leaves nothing to be desired when it comes to positioning accuracy and repeatability. An optionally available rotating tailstock also allows for centric drilling of round components with counter rotation. This means that the cross table deep hole drilling machine series KTE can be used for both eccentric deep hole drilling for all kinds of components and for centric deep hole drilling, making it the new all-rounder by the high-quality supplier from Germany.

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Hall 16, Stand C02

XYZ looks to grow European distribution network at EMO

XYZ Machine Tools will be using its attendance at the upcoming EMO show to further develop its existing group of European distributors. The European market is playing an increasing role in the sales of the Burlescombe, Devon-based business, with sales across continental Europe showing good growth.

"Our attendance at EMO will provide our existing distributors an opportunity to bring customers along to see the latest developments in our range, including the recently introduced LR range of vertical machining centres. It will also be an ideal showcase to talk to new potential distribution partners as we look to increase our presence and develop new business across Europe," says Howard Bamforth, export sales director, XYZ Machine Tools.

The past few months have seen record-breaking sales into Europe by XYZ Machine tools and the attendance at EMO will help to consolidate and further build on that activity. On display will be a cross section of XYZ's machines, including ProtoTRAK controlled mills and lathes, through to the innovative XYZ 2-OP portable VMC to CNC turning centres and the new VMC 750LR vertical machining centre.

Specific machines being shown are the ProtoTRAK SMX 3500 bed mill featuring a 3.75 kW (40 - 5,000 revs/min), 40 ISO spindle, and axis travels of 787 mm by 508 mm by 500 mm (XYZ) alongside the popular SLX 425 ProTURN lathe, which is available with either 1,250 mm or 2,000 mm between centre distance, with a swing over the bed of 480 mm. Power is provided by a 7.5 kW (25-2,500 revs/min across three ranges) spindle and comes equipped with three jaw chuck, air assisted tailstock and quickchange toolpost as standard. Both machines are controlled by the industry leading ProtoTRAK conversational control system. These controls are designed for ease-of-use making them ideal for small batch and prototype work. They are also compatible with offline programming systems to allow use of DXF or parasolid files or G-code from CAM systems.

The XYZ 2-OP enables users to rethink how they use machines and maximise available spindle time. Its compact design and portability allows it to be positioned anywhere in the machine shop, creating machining cells where they are needed. Its capability also means that it can be used as a stand-alone machining centre as well. When used as designed in a machine cell cycle time savings can be significant. While the XYZ 2-OP may be compact and portable, it still has an impressive specification with axis travels of 355 mm by 305 mm by 455 mm (xyz), with a table size of 457 mm x 381 mm, a maximum table load of 250 kg, and rapid traverse is 15 m/min in all axes. Performance is enhanced by the use of a 3 hp (50-6,000 revs/min) BT30 spindle that is supported by an eight-position toolchanger. All of this sits within a footprint of just 1,220 mm by 760 mm.

The Compact Turn CT 65 combines the latest technology and great capacity in a small footprint, matched by an extremely competitive price, making it ideal for subcontractors who can pair it with an XYZ vertical machining centre to provide a versatile, cost-effective, machining package when compared to investing in high cost lathes with Y-axis and live tooling. The CT 65 is highly specified with standard items often seen as options on competitor machines, such as hydraulic chuck, 12-station VDI turret, Renishaw tool setting, swarf conveyor and tailstock, 15 kW (4,500 revs/min) spindle and 65 mm bar capacity. Control is provided

by the latest Siemens 828D ShopTurn conversational control whose ease-of-use make it ideal for novice and experienced CNC users.

Completing the display is the recently introduced VMC 750 LR vertical machining centre. The three machine range consists of the XYZ 500 LR, XYZ 750 LR and XYZ 1000 LR with the designation relating to X-axis travel. The impressive specification of the LR range includes use of the latest Siemens 828D control, with the option of the ShopMill Advanced software package, a standard 8,000 revs/min spindle with 10,0000 revs/min or 12,000 revs/min spindles as options across the range. Other generic specifications include feedrates up to 20 m/min in all axes and 12 or 20 position carousel toolchange as standard, dependant on machine size, with the option of a 24 position arm type on the two larger machines. Table capacity is 250 kg, 500 kg and 800 kg respectively. The use of linear rails on an XYZ machine for the first time is a result of developments in that technology that make them compatible with XYZ's stringent performance criteria. As a result customers have a lower cost entry point into CNC machining centres, but with the confidence of XYZ's backing and reputation in the market.

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Hall 27, Stand A10

More power, more dynamics, more high-speed cutting

Handtmann will present a new combination at EMO which will ensure significant increase of dynamics and cutting performance. Visitors can see the HBZ CompactCell 5-axis horizontal machining centre with pallet automation in combination with the new Handtmann-designed HMH fork head live at the show and experience the real high-speed cutting of aluminium.

You can learn more about the next evolutionary stage of the HBZ CompactCell 200/100 and the new Handtmann-designed fork head HMH. With a whole series of fork heads, Handtmann now offers the key component milling head for its machines from one source. Better rigidity as well as higher dynamics, accelerations and speed are just the most outstanding advantages of the new Handtmann development.

Very high dampening performance and rigidity, the enhanced and bearing independent hydraulic clamping as well as highly dynamic direct drives provide for higher process reliability, speed and accelerations in dynamic 5-axis HSC machining. These advantages especially come into effect when combining long tools with high spindle speed and cutting speed. With the objective of realising highest constant cutting volume using the smallest possible space, Handtmann has managed to develop a milling head especially designed for high speed cutting in order to additionally increase the machines' performance.

The HBZ CompactCell is now available with, amongst others, an extended tool magazine and a larger work zone, as well as improved dampening features, improved ergonomics and temperature compensation together with increased accuracy.

With a whole series of HMH fork heads, the company now offers the key component milling head for its machines from one source. Various head and spindle combinations, together with the retrofitting capability provide the customised configurations offered by Handtmann.

More information on Handtmann products and especially the highlights at EMO can be found on the company's website. To arrange an appointment at EMO, contact Sarah Wohlschlag on 0049 751 5079 943 or email: sarah.wohlschlag@handtmann.de

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Hall 12, Stand C74

Okuma to present super multitasking machines and smart factory solutions

Okuma Europe will display its latest machining solutions to provide supreme connectivity and productivity at this year's EMO exhibition. Okuma's smart machines, as well as the LASER EX series of super multitasking machines capable of turning, milling, laser hardening and additive manufacturing, will make their European debut at the show. In addition, Okuma will introduce its latest Smart Factory Solutions and present new ways to integrate robotics to take productivity in an IoT-environment to the next level.

In accordance with this year's EMO theme "Connecting systems for intelligent production," Okuma's innovations are dedicated to facilitating smart manufacturing by promoting automation and increasing connectivity in state-of-the-art production facilities. Okuma will present eight European premieres and a total of 16 machines at its 1,500 m² booth.

Smart line machining with minimal footprint

Okuma's latest MU-S600V 5-axis vertical machining centre enables 5-face machining with unparalleled floor space productivity. With a width of 1,400 mm, the machine handles workpieces 600 mm in diameter. For high levels of automation, several machine tools of this type can be connected to form a compact smart production line. This allows for a fully automated transfer of the workpiece from one machine to the next, thus eliminating downtime between different processing stages. Production line layouts are easily adjusted to accommodate changes in volume or lead times. Okuma will present two connected MU-S600V in a fully automated cell featuring a vision system and robot-assisted loading and unloading.

Laser-infused super multitasking machining

Okuma's LASER EX line includes the world's first "done-on-one"-machines. The 5-axis vertical machining centre MU-6300V LASER EX is capable of milling, turning, grinding, Laser Metal Deposition (LMD) and heat treatment for a wide range of workpiece sizes and shapes. On-machine hardening is faster and causes less distortion than conventional heat treatment, resulting in

dramatically increased accuracy and throughput. The high-quality TRUMPF laser beam source enables stable laser processing over long runs and both large-capacity and high definition additive manufacturing.

The MULTUS series, known for its precision and accuracy, has been a staple in Okuma's line of multitasking machines for quite some time. The MULTUS U5000 is designed for stable heavy-duty cutting with low spindle speeds. Its unrivalled high-torque spindle serves to maximise efficiency. The MULTUS U5000 handles medium and large parts as well as difficult-to-cut materials, such as Titanium and Inconel. Finish grinding is also among the new arrival's many features. With the addition of the laser-equipped variant, Okuma is taking multitasking machining to new heights. The MULTUS U5000 LASER EX enables laser processing from coating to Laser Metal Deposition (LMD). Okuma will demonstrate the machine's laser hardening capabilities in a dedicated stage-presentation.

In-depth smart factory know-how

Smart machines are part of the IoT-equation for the single-source provider. Having recently opened the second start-to-finish smart factory at its Japanese headquarters, Okuma is ready to pass on its smart factory expertise at EMO. The learnings from the company's "Dream Site" factories resulted

in its Smart Factory Solutions as a means of making Industry 4.0 a reality for customers. Driven by Okuma's latest AI-imbued CNC control, these applications allow for total control of the entire scheduling and manufacturing process to support high product mixes and shorter delivery times, ensuring flexibility even with fluctuating demands.

Okuma's machine status monitor connects not only machines but also production plants around the world, displaying their availability at any given time. It visualises the machine status and accumulates, stores and processes big data, including machining and operating reports and the alarm history. Based on this, continuous improvements can be made to make each run better than the one before. The web-based interface can be viewed from anywhere and on any device, even smartphones. By connecting the machines on display at EMO, Okuma will simulate a smart factory and demonstrate the possibilities afforded by its smart factory solutions live on site.

Superior automation

Automation is yet another key factor Okuma is addressing at EMO. Almost half of the manufacturer's exhibits will be presented in an automation-enhanced setup, with both standard Okuma automation equipment, ranging from APCs to Okuma's Gantry Loader as well as custom solutions employing industry-leading robotics from Okuma's partners.

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Hall 5, Stand G11

Kraft Skymaster combines German design with Chinese build

Kraft Skymaster is bringing together German advanced design engineering capabilities with the efficiency of Chinese production systems, with the final product being scrutinised by German engineers prior to dispatch. UK distributors IWSH Ltd see this as providing the perfect combination for precision and competitive pricing.

On show at EMO will be the high-speed VF series, represented by the VF1615A double column, high accuracy, machining centre. This machine can be supplied with either a 15,000, 24,000 or 36,000 revs/min HSK-63A spindle, with the 24,000 revs/min option being demonstrated at the exhibition. Options added to the show machine include the Heidenhain TNC620 control, BLUM tool and part measuring system and through spindle coolant. While optional equipment is featured on the EMO machine, it is also supplied with a wide range of standard equipment, including European high quality linear guideways, absolute linear scales, adaptive load control, handwheel, oil-water separator and full splash guard. The VF1615A has a large table capacity and axis travels of 1,600 mm x 1,300 mm x 700 mm (X,Y and Z) making it ideal for a wide variety of machining applications across industries such as aerospace, mould & die, or medical.

Ian Warren of IWSH highlights the emphasis on quality and also the flexibility in manufacturing that allows the VF series to be configured with a variety of different options. In addition to the VF Range, Kraft Skymaster also has available another three ranges of machines, these being the VU 5-axis Series, VL Linear Guideway Series and the large VM Double Column Series with axis travels up to 5,100 mm x 3,400 mm x 1,000 (X, Y and Z). As with the VF series these can be configured with a choice of control system, spindle and toolchangers to a specific customer requirement. UK customers also have additional reassurance as any order placed in 2017 will be backed by a full five year parts and labour warranty. Visitors are welcome to see the machine or, alternatively contact Stefania Hadden at IWSH for an appointment to discuss your particular technical requirements.

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Hall 27, Stand C04

First HEIDENHAIN control with touchscreen

The familiar user interface of the smartphone and tablet has been incorporated into the next-generation, mid-range CNC system from HEIDENHAIN. The TNC 620 no longer has soft keys at the side of the screen or function keys and a numeric keypad below. Operation is now via graphics on a large touchscreen, as will be demonstrated on the manufacturer's stand at EMO.

This contouring CNC for prismatic machining and probing is a 4-axis control as standard, but can be extended to 5-axis simultaneous operation. In common with previous versions, with which the new unit is compatible, contour fidelity, high speed and excellent surface finish are obtained. The context-sensitive, intuitive user interface shows the elements that a user needs during all working steps, making the control straightforward and reliable to operate.

The TNC 620's familiar look and functionality has now been combined with modern operation using tapping, swiping and dragging motions on the screen. Easier to operate than previous control versions, the interface speeds data entry, location and manipulation, resulting in tangible increases in productivity.

An operator can move graphics directly on screen dynamically and smoothly, zoom in or out and move or rotate a graphic. A pop-up keyboard appears for inputting text.

Just as quickly and intuitively, swiping motions enable kinetic scrolling at operator-controllable speed. A slow, brief flick results in scrolling over a few lines, whereas a longer, rapid swipe scrolls over many lines and a short tap stops the movement. Searching through long lists, programs and tables to find an NC block or tool, for example, is therefore much quicker.

A video of the control in operation may be viewed at the following url: **www.youtube.com/watch?vuWmOuoxrc6k**

The new MC 8410 main computer in the TNC 620 with touchscreen technology complements the existing MC 7410 and MC 7420 units. For the machine builder, the newly designed operator panel MB 721 can be supplied with dual-channel feedback for safety-critical applications. It features three optional elements that can be assigned to additional keys, key switches or a USB connection and provides potentiometers for feed rate and spindle speed adjustment.

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Hall 25, Stand D48

Guhring to introduce new and extended tooling lines

At the AMB Show in Stuttgart, Guhring presented three new machining systems, 104 and 106, for grooving, boring, broaching and threading as well as the 305 system, a three-fold interchangeable indexable insert for external and internal machining. At EMO in September, the German cutting tool manufacturer will further expand the program for internal machining applications.

In Hall 25 on Stand B60, Guhring will be demonstrating a complete line of extended and new tooling lines aimed at optimising productivity and performance. In the case of the 104 and 106 systems at the exhibition, customers will see new insert additions with a range of new diameters, radii and lengths. With regard to the 305 Series, EMO will present an entirely new indexable insert with sintered rake geometry, an increased range of inserts and new clamping holders for sliding heads as well as modular systems.

From a milling perspective, Guhring will be keen to demonstrate its new Ratio® line of roughing end mills. With flat crested geometry and an optimised roughing profile that demonstrates 60 percent longer service life, the new Ratio high-performance roughing cutter has several geometry adjustments aimed at providing performance far beyond competitor products.

The Ratio drastically increases material removal rates with its asymmetrical cutting

flutes that reduce cutting pressure compared to smooth cutters. This soft cutting action allows the Ratio to perform exceptionally well on low powered machine tools or machines with unstable fixturing. Large flutes ensure optimum chip removal and high process reliability.

Alongside the Ratio will be the extremely popular RF100 Diver series of end mills that has also been enhanced for EMO. It will introduce optimised internal cooling channels and a program expansion for ramp drilling, grooving, rough finishing and finish milling. The RF 100 Diver has been designed for customers with constantly changing requirements. This means it is suitable for five operations with just one tool. Now there are several updates, one is the new optimised bore internal cooling for drilling operations on axial cooling channels and in the case of milling applications, radial cooling channels.

The front and peripheral geometry has been updated through FEM optimisation that will enhance lubrication and chip removal efficiency. This delivers 40 percent longer tool life on sticky materials and stainless and heat resistant materials. Furthermore, the enhanced RF100 Diver series is ideal for process-safe drilling, ramping and HPC milling.

EMO 2017 will also note the arrival of the new PIONEX, the next generation of taps. This high performance tapping line incorporates a new polygon shape that generates 30 percent less torque that coincides with a geometric change of the taps. The PIONEX thread-formers are based on a newly developed powder-metallurgical cutting tool material that demonstrates a higher wear resistance than previously reached. Complementing the design PIONEX has a special surface treatment with a TiCN coating for longer tool life. Additionally, this new line has significantly improved lubrication grooves that further contribute to extending tool life and surface quality.

Industry 4.0 will also be a key focus for Guhring at EMO 2017 and around this subject matter the German innovator will be introducing enhancements to its software-based tool management. Conventional production is undergoing profound change with Industry 4.0 intended to evolve communications and Information Technology in industrial production. Guhring provides its customers with the necessary data for a transparent machining process with its tool management software that is an integral part of the process. The newly programmed GTMS tool software system from Guhring has been re-developed with a user-friendly design.

As well as a new web interface, the new system offers a number of new features for the user to guarantee delivery of the right product at the right time, in the right place and displayed in real-time as a transparent digital tool circuit. The GTMS system is available with the TM 326, TM 426 and TM 526 variants that all aim to deliver cost-effective tooling and make visible savings for the end user.

The Guhring Tool Management software enables a permanent consumption control, reporting on all motion data of tools and the respective costs with complete transparency.

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Hall 25, Stand B60

rose plastic showcases new products at EMO

For decades, rose plastic has dedicated itself to developing, producing and selling optimum packaging solutions for the precision tooling industry. These products had been accepted worldwide under the rose brand of excellence and, consequently, their global success grew quite rapidly.

At the EMO exhibition, rose plastic will display its outstanding packaging ideas on its stand. Along with a number of newly developed packaging concepts, the new TwistPack Plus and new protective caps will be on show for the first time.

The new standard in plastic packaging

In the 70's, rose plastic introduced the TwistPack, a two-piece plastic tube for universal packaging use. Numerous innovations followed, but it remained one of the most successful plastic packaging solutions, used by thousands of demanding customers around the globe today. TwistPack was indeed so successful that many imitations emerged. Yet, the original stayed the original. Now rose plastic has reinvented this already successful product to include the new locking system that allows for faster and easier opening and closing whilst protecting your product even better.

Whenever you have to package extended or cylindrical products, the new TwistPack Plus by rose plastic offers the ideal solution. Its advantages include: easy handling; optimal product protection; attractive looks; maximum flexibility.

The new Twist-Lock-System in the TwistPack Plus comes with very easy universal length adjustment. Just fit to length, twist and lock in place.

The new TwistPack Plus comes in PE, PP and PVC and is available in a wide range of sizes and a selected range of standard colours. Customised colours and individual corporate branding through print are also available.

Protective caps

Expensive quality tools need to be given the protection they deserve. With the new protective caps by rose plastic, damaged cutting edges will be a thing of the past.

Flexible EVA material ensures easy fitting and removal.

So, what's new? The new protective end caps are available in twelve sizes. Each size suits multiple milling cutter sizes. This simplifies the ordering and minimises expenses for logistics and warehousing.

Make sure you visit the rose plastic stand at EMO to be the first to see its new products.

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Hall 4, Stand D84

Sawing and storage innovations on show

KASTO will present at EMO innovations from both sides of the company's business: sawing machine and storage system manufacture. Highlights will comprise an intelligent system for efficient use of energy in automated storage systems, an automatic version of the KASTOmicut swing-frame band saw, the A 2.6, which will make its world debut, and live demonstrations of the high-performance KASTOwin pro AC 5.6 bandsaw.

For many years, KASTO has been supplying its storage and retrieval systems for long stock and sheet with optional energy recovery, whereby surplus kinetic energy, such as that produced in braking or lowering of lifting gear, is converted into electricity and fed back into the grid.

Now the company can optionally supply its automated storage systems with an integrated energy storage unit that permits flexible use of the recovered power. It will be demonstrated on a KASTOunitower at EMO.

The solution, which can be retrofitted to existing installations, not only reduces

energy costs but also improves the quality of the supply because power is continuously drawn and load peaks are avoided. Operators can often use smaller transformer stations, reducing investment costs.

During 2016, the KASTOmicut swing-frame bandsaw range was introduced for workshops. A fully automatic version is now available, model A 2.6, which will be on show for the first time at EMO. Compared to the manual and semi-automatic variants, it features additional functions including monitoring of saw blade tension, carbide blade guides and an optional chip conveyor for virtually unattended operation.

All of the workshop machines are designed for high accuracy sawing to length of tubes, sections and solid materials as well as mitre cutting. The range extends to 260 mm capacity for round stock, 310 x 260 mm for flat. Mitre cuts are from -45 to +60 degrees and the angle is continuously adjustable, as is the band speed, which can be set from 20 to 110 m/min. A torsionally rigid, vibration-damped, cast iron frame ensures excellent cutting quality, even when processing difficult-to-machine materials.

With the KASTOwin pro AC 5.6, the company will present a high-performance bandsaw offering short cutting times, long tool life and intuitive operation. The automatic machine is optimised for use with bimetal and carbide blades. Depending on the type of blade, processing times can be more than halved.

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Hall 15, Stand D58

Aerospace subcontractor takes off with Victor CNC 5-axis

When McGreevy Engineering made a strategic decision to move into the aerospace industry, the company recognised that relatively complex component manufacture required multiple and time consuming setups. The Belfast subcontract business realised it needed to take its first step into 5-axis machining, with the machine of choice being the Vcenter AX800 from Victor CNC.

Tommy Hanna, works manager at McGreevy Engineering, says: "Until now, a lot of the work we've been doing has required us to do it in three or four different operations. We saw a need to buy a 5-axis, to compete with our competition and to cut out operations to help make us more competitive."

Relatively new to the UK marketplace, the Vcenter AX800 appealed to the AS: 9100 certified manufacturer for a number of reasons, as Tommy Hanna explains: "We already had a Victor CNC lathe and it's been very reliable. So, the reason we bought the AX800 was because it has a bigger capacity than most of its competitors. It has 1.6 m in the X-axis. This allows us to use it as a large bed 3-axis machine as well as a very versatile and robust 5-axis."

"Additionally, the operators have very easy access to the machine. We also have a 15,000 rpm spindle, which means we are conducting high speed machining on a lot of our work. Providing our jobs are set up correctly, we can hit all 5 sides of the workpiece at high speed and this is making a huge saving for our business."

The company has a variety of 3-axis machining centres, but with the 5-axis AX800 the company needed more tool positions. Tommy Hanna recalls: "Obviously with 5-axis we need more tool stations to hit the job from all directions and the AX800 has 40 tool positions. Added to this, the Victor AX800 is the first machine we have with a BBT40 spindle configuration. This allows us to use our BT40 tools from the other machines."

It is recognised that the BBT40 configuration generates more stability, rigidity and enhances tool life and performance. So, when McGreevy Engineering gets more familiar with the new Victor installation, the company will notice a marked improvement in tool life, surface finishes, greater precision levels and productivity.

"As well as the BBT40 spindle, the overall build quality and rigidity of the Victor machine is outstanding," adds Tommy Hanna. "We recently delivered a job to a customer and they couldn't believe the surface finish. The customer actually said that they often polish jobs after machining, but the quality and surface finish from jobs produced on our new Victor AX800 are outstanding and require no polishing. The machine specified by the Northern Ireland company includes a through coolant facility and swarf conveyor system. Tommy Hanna concludes: "We opted for the full package and the 700 mm in the Y-axis, 1,600 mm in the X-axis, plus the 800 mm rotary table, means we can machine some particularly large parts on the machine. This is especially the case with the rotary table as we can machine one side of a long part and then rotate it to do the other side. We are expecting to considerably grow our aerospace work in the near future and we'll certainly be looking at another Victor CNC 5-axis machine."

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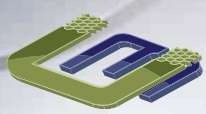

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Aerospace manufacturer becomes more datacentric with Javelin

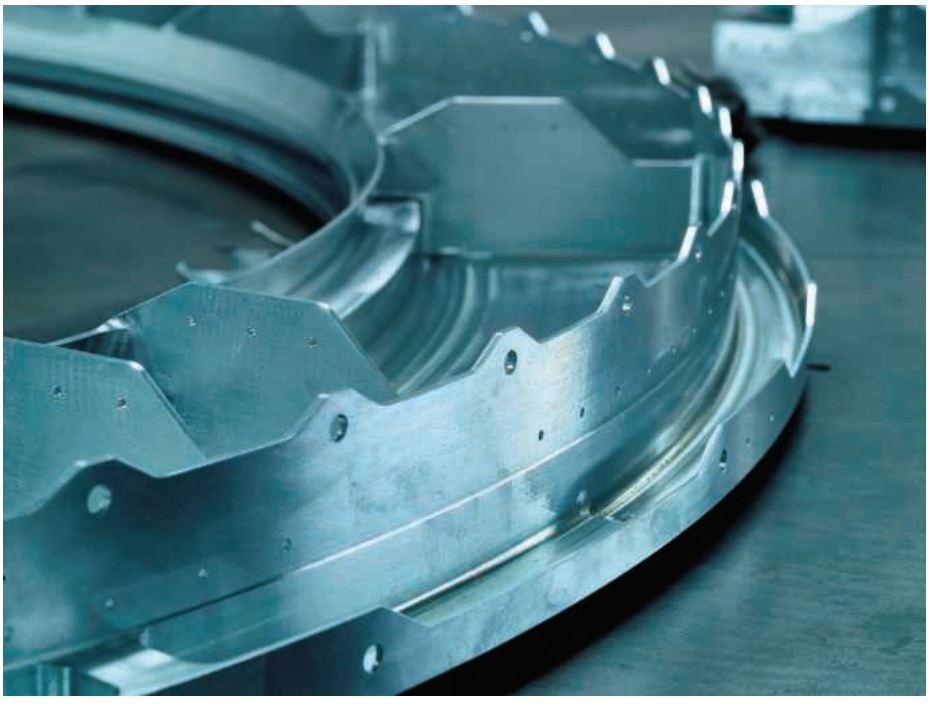
Upgrading its Javelin production control software was the catalyst for an aerospace manufacturer to roll the system fully out across the business, enabling them to provide more data for new investors.
A private equity investor (Agathos) is looking to grow former family firm Smiths Harlow. Former wartime Spitfire pilot Gerald Smith founded the company over 50 years ago, and Director Ian Knightley says with recent investment by the investor, they are becoming more datacentric.

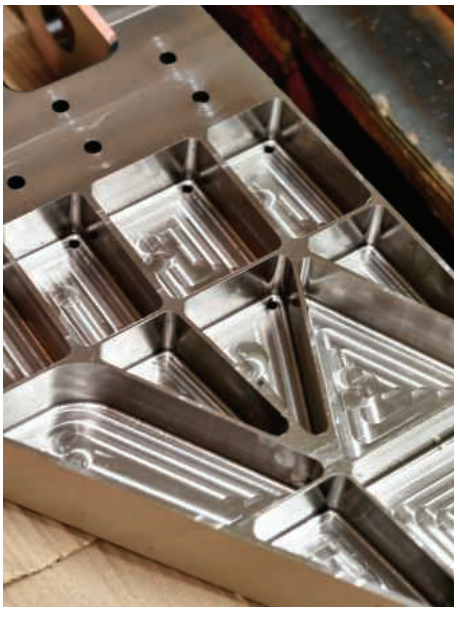
He sees Javelin, from Vero Software, as providing the infrastructure with full, real-time, information, to allow them to grow, either by acquisition or organically.

Based at Harlow in Essex, they have built a formidable reputation in the industry, manufacturing a wide range of commercial aircraft components for customers such as Rolls Royce, Bombardier, Safran, GKN, and a number of smaller 1st tier companies.

Focusing on aero engine parts mainly with a diameter of 200 mm and above, and turned parts up to three metres, they have an impressive array of sturdy CNC machines capable of working with hard on exotic metals including Inconel 718, Waspaloy, Nickel Alloy c263, and Haynes 188.

Amongst the components currently going through the shop floor: Titanium aero engine casings, the visible part at the front of the engine containing the fan blades, and high-pressure turbine casings.





All programs for its range of 25 machine tools including lathes, vertical mills and machining centres, are developed in Edgecam, also from the Vero Software stable. They include a six-pallet Burkhardt & Weber, which cuts most of their Titanium parts, and a recently installed Dugard DBM 2150, along with machines supplied by Cincinnatti, Kitamura, Toshiba, Mandelli, Deckel Maho, Kia, Mazak and Boehringer.

Engineering manager Tim Hambridge says they use Edgecam's Part Modeler function for design, getting the correct stock sizes, laying out any tooling lugs in the material, fixture design, clamps, and fixture drawing.

Tim Hambridge explains: "Then we move on to the part programming in Edgecam, using Waveform roughing on both milling and turning."

Rolling out the Javelin system to many of the 70-strong workforce across the 60,000 square foot factory is a vital part of their development plans.

Ian Knightley says: "We'd been using a ten-year-old version of Javelin's predecessor, Jobshop, which contained many bespoke items. But we only really used it as a production control MRP system. We're now taking advantage of Javelin's powerful capabilities to give us full control over the business, as it provides us with whatever information we need about all aspects of our processes."

A component's Javelin journey begins with Sales Order Processing. Some come in by EDI, and others are entered manually.

Ian Knightley continues: "And MRP is vital to us. Working almost exclusively on aerospace parts we know at least a year in advance what the customer is looking for, and we need to be flowing that information through to our suppliers. For instance, some forgings that we purchase have a lead time of between 40 and 50 weeks. Therefore, the MRP function helps us give our suppliers a good signal of our future requirements."

He says Purchase Orders flow naturally out of MRP.

Ian Knightley says: "A central area used to produce all purchase orders, and everyone would go there to authorise them. Section Managers now raise their own purchase orders in Javelin, which are also authorised in Javelin."

Every job going through the machine shop has a routing card and all relevant documentation, such as drawings, operation

sketches and self-inspection sheets is attached to it through Javelin's Document Linking and Viewing functionality.

Ian Knightley explains: "We can print those documents to ensure that the shop floor operator has the latest data and documents relating to the job they're working on."

Updating to Javelin 2016 R2, quickly followed by 2017 R1, has revolutionised Smiths Harlow's scheduling. Previously, Work To lists were printed weekly for each machine. Now that information is available to managers around the business through Javelin and with a number of Shop Floor Data Capture terminals throughout the workshop, each operator can readily see forthcoming jobs.

Ian Knightley continues "Until recently operators were working with paper timesheets, but now they're logging on and off Javelin each day through SFDC, and processing each stage of their work."

The Materials Control functionality is particularly important to the company, as they need to adhere to the aerospace industry's strict traceability requirement.

"We use the serial number feature within Javelin, so we can now tie all items down to serial numbers as they go to the machine shop."

Costing gives them the ability to analyse every job by the actual hours against the planned hours for each operation.

Ian Knightley says: "We can see a complete snapshot for each job, drill right down and see the materials allocated to it, and pull data out of the system on a monthly basis for full analysis."

In conclusion, he says Javelin's simple systems management meant they could easily customise their screens, creating hotkeys for functions they use regularly.

Ian Knightley concludes: "Having those keys on the Javelin desktop instead of having to go down the tree structure has speeded up the process considerably.

"Everything is now rolled up into the one system for everyone. Javelin provides more real-time data about the business, which is easy to analyse, and enables customised and complex Crystal Reports to be produced.

"It gives us full control of the business."

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Flexible manufacturing system for the Chinese aircraft industry

Whilst others are still romanticising Industry 4.0, Swiss-based Starrag Group is already realising digitally networked production in Southwest China. With a completion date of summer 2019, six ECOSPEED F 2060 are to be installed at Chengdu Aerospace's aircraft factory in China to create one of the most productive and efficient plants in the world. The plant will be used for the complete processing of aluminium structural components.

A high level of investment is being made in the Chinese aviation industry. The industry plans to build over 1,900 new aircraft by 2025 at a total cost of around 300 billion US dollars and is investing heavily in new production technology.

Chengdu Aerospace Plane Aviation Machinery Equipment Ltd. has now ordered a digitally networked flexible manufacturing system (FMS) with cell controllers from the Starrag Group. Work will take place between January 2018 and summer 2019 to install an FMS comprising six ECOSPEED F 2060 and a total of 20 pallets, two set-up stations, a transfer car and 17 storage locations. The ECOSPEED machining centres are characterised by 120 kW high-performance spindles, 30,000 rpm, a pallet size of 6,000 mm x 2,000 mm and Sprint Z3 parallel kinematic machining heads. Thanks to its unique patented kinematic process, the Sprint Z3 head greatly exceeds the position speed of a multi-axis milling head.

In addition to standard components such as angular milling and drilling heads, the FMS also contains two new highlights. The Sonic Eye measuring head significantly reduces the effort required to take measurements during the production of structural components which require documentation. The ultrasonically measured data, with measuring accuracy: ± 20 µm, is wirelessly transmitted via radio antenna to the CNC, which also controls the use of the Sonic Eye.

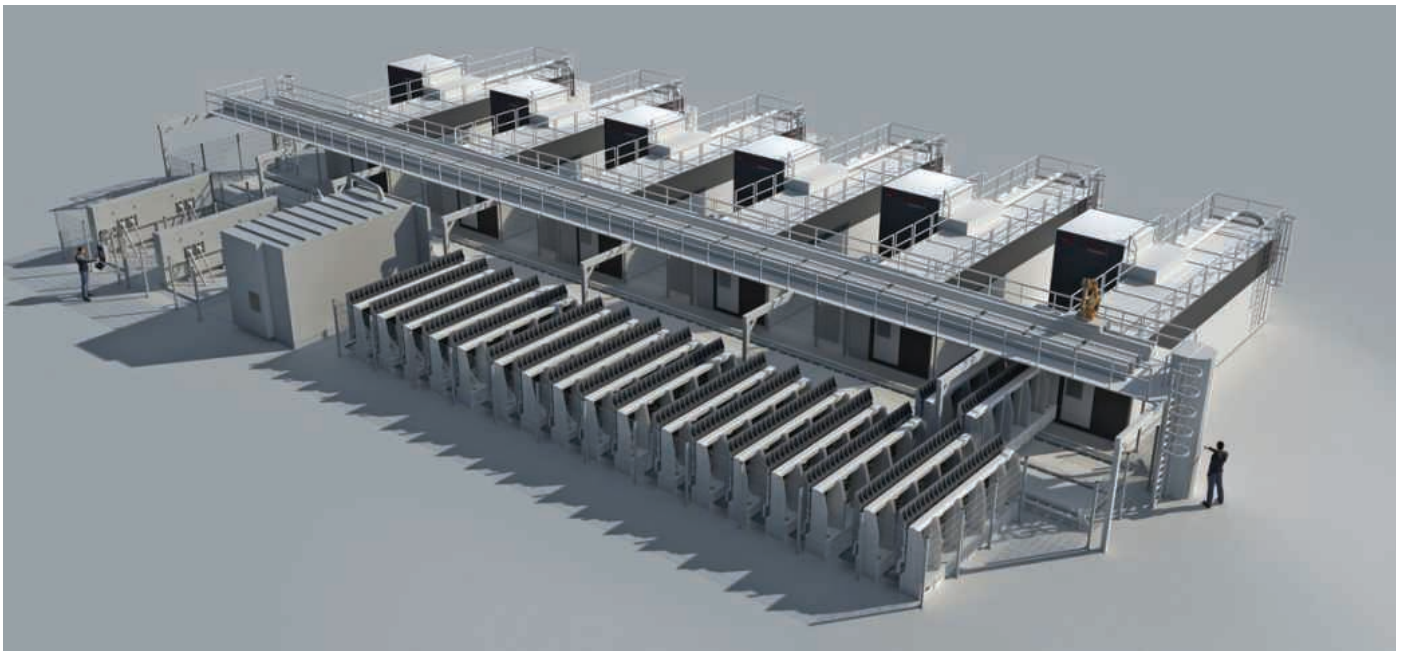
The CNC program ECO-TRIM also saves time and money as the operator can quickly check the machine and compensate for any deviations as necessary. A clear saving of time allowed the automatic calibration. This program takes a fully automatic check of the current status of the machine and generate a log with a time stamp. This log is then saved in the CNC as an "electronic fingerprint".

Other technical details also contribute to making the FMS a complete system that is unique for its type: A central plant supplies all six machines with coolant and a central collection system with silo and briquette presses takes care of chip extraction. A robot magazine located above the FMS features 1,500 slots to supply the machines with tools from a central location. The integrated workpiece washing system ensures that components remain clean.

Such projects are rare today and even then are usually only pilot projects during "green field" development of a new factory. Thanks to a large number of successfully handled large projects, for example in the global airline industry, the Starrag Group can provide this type of customised digital manufacturing solutions with a high level of process reliability almost "off the shelf".

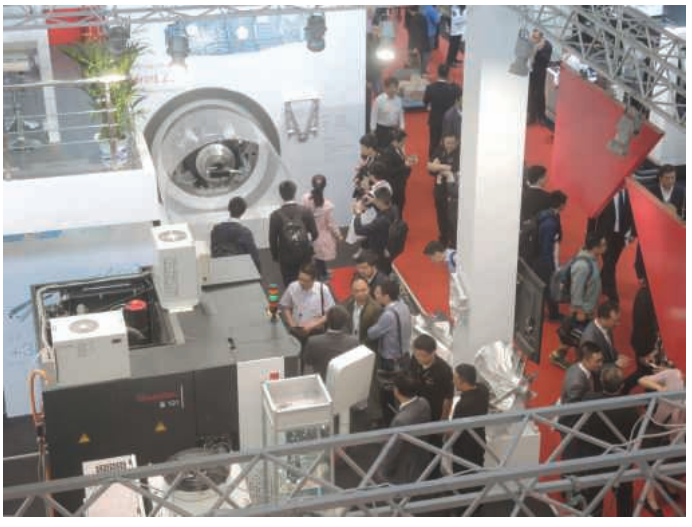
Walter Börsch, CEO of the Starrag Group, says: "We have laid the foundations for Industry 4.0 with our own 'Starrag Integrated Production System' (IPS) and the cell controller technology that has been developed in house. With our digitalisation solutions, we can provide all of the typical customer requirements, such as higher productivity, greater safety and high levels of growth".

Interested parties learned more about Industry 4.0 at its finest at the CIMT China International Machine Tool Show in Beijing



With a completion date of 2019, six ECOSPEED F 2060 are to be installed at Chengdu Aerospace's aircraft factory to create one of the most productive and efficient Industry 4.0 plants in the world for the complete processing of aluminium structural components

At the CIMT in Beijing, the Starrag Group showed the Sprint Z3 parallel kinematic machining head; for decades, these have set world records in the aviation industry for the machining of aluminium components in conjunction with ECOSPEED machine technology and Industry 4.0



in April this year. The Starrag Group showed the Sprint Z3 parallel kinematic machining head. This can now also be driven by a newly developed 150-kW spindle, which, when compared to the figures achieved using the 120-kW spindle, increases the machining performance when processing high-strength aluminium by 25 percent to 12 l/min.

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

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EMO 2017: Hall 12, Stand B60

Tornos introduces 4-axis bar machining solution for aerospace industry

Tornos has introduced its new Almac CU 1007R, an innovative new machining solution that has been developed to produce prismatic components such as high-precision connectors for the aerospace industry. The CU 1007R machine is equipped with a bar-type loader and a comprehensive system for simultaneous 4-axis machining.

The new Tornos solution is ideal for complex automated machining in the aerospace industry with its pick-off collet and finished-workpiece collection unit that are integrated into the machine. Making it more appealing for the aerospace connector sector, the Almac CU 1007R has bar-type loading built-in to provide superb production autonomy levels. This type of loading system has now been integrated into the CU 1007R machining centre to combine precision and large-volume production, while keeping the investment level under control.

The machining of high-precision connectors for the aerospace industry actually demands high precision and in particular, the ability to produce large volumes with maximum autonomy. Thanks to its mechanical concept, the CU 1007R boasts high precision machining, even in its basic version. This is more prominent when

the customer specifies a machine with linear scales instead of rotary encoder. As far as the autonomy in production is concerned,

the machine previously had to be equipped with loading peripherals such as a small robotic arm that were intended to load material billets and often proved to be expensive.

Depending on the size of the connectors to be machined, up to 100 parts can be machined from each 3 m bar. This corresponds to an autonomous production level of between 20 and 30 hours of machining per bar, subject to the complexity of the parts to be machined. The question may arise as to whether the use of an automatic bar feeder is reasonable because of the additional investment required. If it does, then a manual bar loader offers sufficient autonomy at a very competitive price.

Autonomy of 24 hours of production from a bar is perfectly acceptable and this restricts operator intervention to one single bar change per day. This allows the operator to change the bar, empty the finished-part basket and change the tools at the same time.

Simultaneous 4-axis machining with pick-off collet

The bar is fed into a dividing head and is clamped by a collet that permits bars up to 30 mm diameter to be fed. Thanks to the A-axis on the dividing head and to the spindle movement in X, Y and Z directions, the bar can be machined on 4 sides. This is done by front machining and also using tangential machining on one side. The CU 1007R has a fixed table that enables the bar to remain stationary in Y-axis direction and this is perfectly suited for bar-type loading. This is not the case with machining centres equipped with a compound table with movements that must be compatible with the bar loader (bar movement within its guide).

The pick-off collet is mounted on a slide (X2 axis) and this configuration is beneficial for two reasons. On the one hand, the workpiece can be clamped while being cut off and the machining on the 6th face. Secondly, the bar can be held and pulled for the purpose of bar feeding. This additional X2 axis is controlled by the NC unit and its travel is adjusted to the length of the workpieces to be produced.

Customised part collection

Once machining has been finished, a parts catcher that is attached to an air cylinder is moved underneath the pick-off collet, which can be opened to release the part; subsequently, the part is transported into a large collection basket that can accommodate the part production from several bars. The collection basket incorporates an oil bath to cushion the fall of the finished parts.

Change-over from billets to bars

This comprehensive solution has been carefully conceived by Almac's engineers and it opens up new horizons for the CU 1007R that up to now had been primarily used for the machining of billets.

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Hexagon delivers laser trackers for Airbus project

The integrator for the aerospace giant Airbus has committed to purchase 30 new Leica Absolute Tracker AT403 systems at the Hamburg Plant responsible for final assembly of the A320 aircraft family.

Leading metrology and manufacturing solution specialist Hexagon Manufacturing Intelligence has announced a new step in its longstanding partnership with Airbus. Thirty of the newly released Leica Absolute Tracker AT403 systems have been purchased for use at the established Airbus assembly facility in Hamburg. These advanced laser trackers will become a key part of the final assembly process of the A320 family of commercial passenger aircraft.

Hexagon continues to provide innovative metrology solutions that help the aerospace giant meet its time, cost and quality goals as they ramp up production in Germany.

"After more than 20 years of working with Airbus, we're very proud to be bringing our latest laser tracker products on board with Airbus's strategic A320 in Hamburg," says Stéphane Malet, Airbus key account manager for Hexagon Manufacturing Intelligence.

"Our products have so much to offer for big projects in the aerospace industry. With the increasing data capabilities of Hexagon measurement solutions, innovative businesses can build accurate 3D data right into the global production process, delivering key efficiency improvements and letting them achieve the objective of every production manager: getting things right the first time around."

Hexagon is active across Airbus, working to optimise the links between the Group and its most important suppliers. Facilitating its aim to have suppliers deliver plug-and-go 'techno-bricks' to their final assembly plants, Hexagon offers dedicated training to any of Airbus's tier one suppliers that need to integrate advanced metrology into their manufacturing process.

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Northern Manufacturing & Electronics returns to Manchester

NORTHERN 17 Manufacturing & Electronics
EventCity | Manchester | M17 8AS
27th – 28th September 2017

Northern Manufacturing & Electronics, the North's top industrial technology and engineering show, returns to EventCity, Manchester on September 27th and 28th for the fifth consecutive year. The show once again offers its customary blend of leading hardware vendors and service providers from across a wide spectrum of engineering activities.

Northern Manufacturing is now well established as the region's top showroom for the latest hardware and the considerable amount of subcontract engineering expertise to be found in the North. The strong presence of the aerospace industry alone (nearly a quarter of the UK's £32bn aerospace industry is found in the North West) makes the event an extremely important showcase for machinery manufacturers and vendors, several of whom are debuting new machines for 2017.

Two new machines from Haas Automation will be seen for the first time in the UK at Northern Manufacturing 2017: the new 2017 ST-15 turning centre and DM-2 high-speed drill-mill centre. The new

machines will be put through their paces with live cutting demonstrations. The ST-15 is the latest addition to Haas Automation's line of big bore turning centres, the DM-2 compact drill-mill centre is pitched at high-mix production shops looking to increase throughput, as well as job shops looking for a small, fast 40-taper machine.

Yamazaki Mazak has expanded its presence to two stands for 2017, giving live demonstrations of its Variaxis range of 5-axis machining centres. The North's aerospace

industry has long been an important market for Mazak making, the firm believes, the Northern Manufacturing & Electronics show the ideal showcase for its machines' capabilities. Combining a compact footprint with the ability to offer simultaneous five-axis machining across multiple surfaces, the Variaxis j-500/5X can be used in a variety of sectors, including aerospace and oil and gas. Its advanced manufacturing capabilities (it comes equipped with a 5-axis version of Yamazaki Mazak's SmoothX technology) are suited to small batch, volume production or prototype work, says the firm.

Amada will show advances in both standalone and automated press brake technology. Built on the solid foundation of its HFE series, the HFE3i 1003 press brake

includes additional production-enhancing features and an innovative touch-screen AMNC 3i interface. Also on the stand will be the HG-ATC (automatic tool changer), designed to load even the most complex tool layout within three minutes, allowing operators of varied experience levels to operate the bending system effectively.

On the Bystronic stand, the firm's Xpert 40 press brake plus the innovative Mobile Bending Cell will be being put through their paces. The system is designed to help users to produce quickly by automating as many processing steps as possible while at the same time providing the possibility to work manually when required. The compact Xpert 40 can be set up and put into operation in virtually any environment, claims the company. Users can set up the robotics system on the Xpert 40 in just a few minutes. When not in use, the bending robotics can simply be moved to one side.

Other interesting automation products on show include the Olympus Technologies Universal Robot Welding System, featuring On Robot's RG2 flexible gripper and Optoforce's force torque sensors. The OptoForce force torque sensor provides robots with a sense of touch that has not

been previously available to collaborative robots, says the company. Olympus' UR welding system provides a cost-effective robotic MIG welding solution, ideal for companies who have previously not been able to justify the investment in an industrial robot cell, or simply do not have the space for one.

Northern Manufacturing & Electronics provides a natural focal point for subcontract services, particularly where specific expertise is required. Among the many contract engineering firms present in 2017 is Chesterfield-based Mintdale, a well-equipped CNC machinist that also offers clean medical assembly, brazing and induction brazing to medical standards. Items produced to ISO 9001-2008 quality standard for the medical, brewery, aircraft and shop fitting industries. Other well-known names exhibiting include Jenks and Cattell Engineering in Wolverhampton, specialists in sheet metal presswork, with presses from 10 tonnes to 1,000 tonnes, as well as laser fabrication and welding. A full list of service providers exhibiting this year can be found at **www.industrynorth.co.uk**

Alongside the show itself, the comprehensive free technical seminar programme gives visitors the chance to hear about the latest ideas in manufacturing from acknowledged experts in their respective fields. Some of the topics under review in the 2017 programme include implementing Lean, CE Marking, an examination of 3D printing, the advance of Industry 4.0 and an insight into the forthcoming General Data Protection Regulations that will have profound implications for businesses. A full list of seminars can be found at **www.industrynorth.co.uk**

The show's free entry and free onsite parking for 3,000 cars make it possible to easily fit in a visit as part of a working day. EventCity is also easily reached by public transport from Manchester city centre for those wishing to spend a more relaxed day exploring what the show has to offer.

To register online for free tickets simply visit www.industrynorth.co.uk. Visitors can follow all the latest news from the show at linkedin.industrynorth.co.uk or on its blog page at **http://blog.industrynorth.co.uk**

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Colchester fires the first Magnum at Hi-Spec Precision Engineering

When Hi-Spec Precision Engineering Ltd needed a new machine tool for its machine shop, the Rutland-based company quickly opted for the heavy-duty Colchester Magnum centre lathe from 600 UK at MACH 2016.

Commenting upon the purchase, managing director Darren Grainger says: "The larger capacity end of the work we do, is also the lower quantity of our work. We have all the latest CNC machine tool technology, but with the Colchester Magnum centre lathe, we can just hop on the machine, do a quick turnaround job and get it out the door in the time that many CNC jobs would take to set."

"The Colchester Magnum also has the largest diameter to length ratio of all our machines and it will also take the heaviest parts. There are some jobs that come through the door that have to go on the Magnum centre lathe as they wouldn't fit on our other machines and we just couldn't take these jobs on otherwise."

"We originally had another machine in the place, but we weren't happy with our purchase so we replaced it with the Magnum. After all, the Colchester and Harrison brands are the most reputable and longstanding machines out there. When buying the Magnum, we already had a number of 600 UK machines and we didn't want to buy a Chinese product, as we had been down that route before."

Referring to the machine specification, Darren Grainger continues: "Whilst I have gone for a machine with an 800 mm swing over the 660 mm variant, the bed is wider and the machine is heavier than any other machine in its class. For the Magnum, it was about having some confidence in the brand you were buying and I wanted to know that what I was getting was going to be suitable for what we wanted to do.

Everything on the lathe is heavy duty, right down to the tailstock and steadies. All the key features are 30-40 percent bigger and regarding the cost, the machine is more expensive than some variants, but this is all about the longevity and build quality of the Colchester Magnum. Our previous machine was a third of the cost, but lasted four years and we kept it for six. With the Colchester Magnum, I'm confident it would last about 30 years."

With this version of the machine being 2 m between centres, the Magnum arrived at the same time as the Harrison Alpha 1460XS CNC combination lathe, also from 600 UK.

The Alpha 1460XS was supplied with a tooling turret and this machine works in synergy with the Magnum. Darren Grainger says: "Sometimes we'll use the machines as a 'mini-cell' with both machines running different operations on the same job. The machines complement each other very well.

Everything on the two machines has been supplied by 600 UK with the chucks provided by Pratt Burnerd International. The workholding runs very precisely and efficiently with no issues whatsoever and that is what we want from our machine tools and the suppliers."

The Colchester Magnum has centre distance capacities up to 6 metres in length and combined with spindle bore options up to 230 mm and powerful 20 kW spindle motors fitted as standard, the Magnum centre lathe is designed to be totally comfortable with any heavy metal turning requirement thrown at it, in such diverse industries as oil and gas, utilities and shipbuilding.

Paul Rushworth, 600 UK sales director concludes: "As Darren can testify with his vast experience of Colchester and Harrison lathes, our machines have an outstanding reputation for high quality, reliable turning performance with outstanding service, requiring the absolute minimum of maintenance over their working life and our heavy-duty Magnum centre lathe carries on that unique tradition."

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Cincom Miyano

JC Precision Engineering on track with Citizen

JC Precision Engineering earns 70 percent of its turnover from producing a wide range of components for racing go-carts, a business that has grown progressively from the race track participation of the Munday family led by father Vincent who set up the firm 36 years ago and is now run on a day-by-day basis by his two sons Dan and Chris.

Production at the Market Overton factory in Rutland is steeped in CNC machining centres and fixed head lathes for turning, for which around £1 million has been invested over the last five years, usually buying one machine a year. However, around the family table, discussions have often broached the subject following a visit to MACH 2014 at the NEC that perhaps they should invest in CNC sliding head turn-mill technology for producing smaller precision parts.

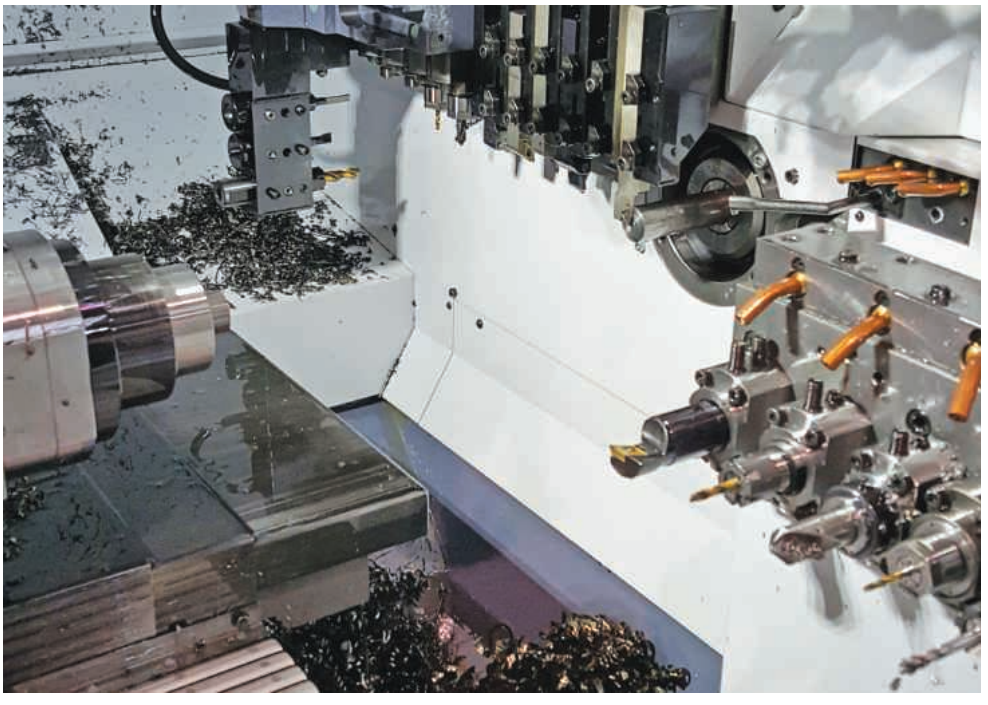
Director Dan Munday says: "We used MACH 2016 as the final decider and ordered the Citizen Cincom L32-VIII with removable guide bush which was installed in July. Almost immediately we wondered why we had debated so long. Indeed, such has been the success of the machine already, that we are now planning for a second because we are becoming concerned we could run out of capacity."

Since July, apart from more effectively switching work from other machines, the firm has won new contracts that they could never have dreamed of producing before.

The directors have already noted how they have increased not only profitability, but also throughput, with cycles now being clocked two-thirds faster than before. For example one part taking 50 plus seconds on a fixed head machine is now produced in just 17 seconds.

However, most important to them is that lead times are being decimated against previous methods which involved separate fixed head turning and often further milling and drilling setups as well as manual finishing. Indeed, further benefits are also being accrued from the ability to achieve total consistency enabling 'through-the-night' running and the ability to maintain tolerances as tight as 10 micron when needed. As a result, previous production methods involving four or five setups have been reduced to one including in-cycle deburring. Batches as small as 20 have proven to be economical especially when planned with other work with the machine already either set with or without the guide bush in place or having no need for a bar change. This economic capability for small quantities has also encouraged design input for certain key customers as well as development and providing a prototype service.

In ordering the Cincom L32-VIII the Munday's elected to specify the detachable guide bush. Dan Munday said: "We have considerable demands for special sizes of short length parts such as spacers and even washers where we can save on bar end material and it takes less than 30 minutes to change over to a guide bush when needed."



One of the concerns holding back the venture into CNC sliding head technology was the different approach to the application when compared with more traditional CNC turning. But, admits Dan Munday: "We had excellent support from Citizen which quickly convinced us how our worries were totally unfounded. What makes things easier is the Cincom control software plus Citizen's AlKart CNC Wizard programming aid which certainly helped us to get up to speed very quickly."

He describes how they are running a wide range of parts in materials including EN24, 316 stainless steel,

plastics, aluminium and brass. These include special bolts and pins, master cylinder brake pistons, brass fuel fittings and stub axles. Indeed, a further point of disbelief in the capability of sliding head machining has also been dispelled in producing the stub axle out of 31 mm diameter EN8 when in a single cut of 7 mm, the part was taken down to 17 mm diameter and held to a 0.025 mm tolerance. The part was then threaded each end from the main and sub-spindle and within the cycle, a hexagon was milled adjacent to a flange.

JC Precision Engineering, which employs 15 people, acquired its premises in 2000 having a floor area of 1,000 m2 and is currently planning to add another building on the site. This will enable them to meet future demands and to install a second Citizen helping to increase turnover from the current £1 million from the karting sector as well as its more general subcontract business.

As Vince Munday explains: "The whole business has always maintained a steady growth and with the input into design, development and prototype activities, although this takes up valuable production time, it is paying massive dividends in customer loyalty and a longer-term order book."

The Cincom L32-VIII has five axes with a 40-tool capacity of which 15 can be driven. It has a 7.5 kW main and 3.7 kW sub-spindle each having a maximum speed of 8,000 revs/min. Driven tools are powered by a 1 kW, 6,000 revs/min motor. Of major importance, which is proving to be a key factor in the firm's applications, is the ease of removal or replacement of the guide bush assembly from the main spindle to accommodate the machining of greater numbers of shorter parts from a bar.

Citizen Machinery UK Ltd, based in Bushey, is a CNC machine tool specialist supplying the latest CNC turning technology to UK industry. Following a merger in January 2011 the company incorporates staff and resources from the UK machine tool operations of both Citizen (Citizen Machinery UK Ltd, formerly NC Engineering Ltd) and Miyano (Miyano Machinery UK Ltd, formerly Macro Machine Tools Ltd).

It has been successfully serving UK manufacturing industry since 1974, now as part of the Citizen group, famous also for its precision watches and electronics its product range focuses specifically on Citizen's range of high performance Cincom sliding head CNC lathes and Miyano fixed head CNC lathes.

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EMO 2017: Hall 26, Stand D22

Quick-off the mark

Faringdon Precision Engineering becomes the first UK company to invest in a Doosan lathe equipped with a Siemens control

Two years ago Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, introduced a range of Siemens-controlled vertical machining centres into the market. The move enabled precision component manufacturers preferring Siemens controlled machines to invest in Doosan machining centres.

Some 24 months after their introduction, sales of Doosan machining centres with Siemens controls have grown exponentially.

Earlier this year, Mills began a phased introduction of Siemens-controlled Doosan lathes into the UK and Irish markets starting with its best-selling Lynx and Puma GT series.

One of the first, if not the first, companies to take advantage of this move is Oxford-based, leading precision subcontract specialist Faringdon Precision Engineering.

Faringdon Precision Engineering, established in 2006, has invested in a new Doosan 10" chuck/81 mm bar capacity Puma GT 2600 lathe, with the Siemens Sinumerik 828D control, from Mills CNC.

Faringdon Precision is well-respected for its machining prowess and production capabilities, and supplies high-quality, high precision and often complex machined components, prototypes, one-offs and small-to-medium batch series, to a growing and diverse range of UK and overseas customers operating in advanced hi-tech manufacturing sectors i.e. rail, nuclear, medical and scientific instrumentation.

Faringdon Precision Engineering has invested in a new Doosan 10" chuck/81mm bar capacity Puma GT 2600 lathe from Mills CNC

The GT 2600 lathe, since being installed at Faringdon Precision's facility in March 2017, is being used, almost exclusively at this moment in time, to machine a range of parts for the US semi-conductor market.

Comprising different diameters and different lengths, these stainless steel (304) parts are machined to high tolerances and surface finishes, and are then assembled to create cylindrical-shaped 'chambers' which are used to collect, filter and ultimately incinerate hazardous gases used in the manufacture of silicon chips and integrated circuits (IC's).

Machining stainless steel requires a robust and reliable machine and the GT 2600 is more than up to the task.

Typical parts machined by Faringdon Precision Engineering

Puma GT 2600 lathe

The Puma GT 2600 is a versatile and rigidly-designed box guideway 2-axis lathe equipped with a powerful 22 kW/3500 rpm spindle (622 Nm torque) that makes it ideal for machining a wide range of materials and for undertaking heavy-duty roughing operations, often involving interrupted cuts, through to fine finishing.

The machine's rapid rates of 2 4m/min - X-axis and 30 m/min - Z-axis, and its fast

servo-driven turret with 10 tool positions, ensure that the GT 2600 gets down to business fast enabling manufacturers to improve part cycle times and, as a consequence, better achieve customers' tight lead times.

Trevor Timpson, director at Faringdon Precision, explains: "Doosan machines are reliable and represent great value, and the GT 2600 lathe delivers excellent cutting performance as well as providing us with greater process security."

The machine, as previously mentioned, is equipped with the Siemens Sinumerik 828D control This feature was specifically requested by Faringdon Precision.

Trevor Timpson says: "We invest in CNC machines, both machining centres and lathes, with Siemens controls because, from both a programming and operating perspective, our staff find the design, layout and functionality of these controls easier to understand and use."

Investing in machine tools with a 'common' control platform provides a number of advantages to Faringdon Precision. All production staff are familiar with the design and architecture of Siemens Control systems and have the skills and confidence to operate and/or programme all of the company's machine tools. Jobs and part programs can be transferred between machines ensuring fast, efficient and seamless production.

The preference for, and investment in, Siemens-controlled machines has also helped Faringdon Precision address the issue of skills shortages.

Trevor Timpson concludes: "We employ 10 members of staff at the company and four of these are apprentices recruited directly from local schools and colleges. The intuitive and conversational nature of Siemens controls, combined with their ShopTurn and ShopMill icon-driven software, means that the apprentices do not need to know all the 'ins and outs' of G-code programming before they can become productive and setup the machines to start cutting metal.

"As a result, by investing in machines with Siemens controls we have been able to significantly increase our production capabilities and improve our lead times, cost-effectively and in a relatively short period of time."

Mills CNC is highly-regarded and respected in the machine tool market and across all the manufacturing sectors that it serves. These include aerospace and defence, power generation, motorsport; oil and gas, medical, automotive and general precision component manufacture, to name but a few.

Its reputation is built on the quality, reliability and performance of the Doosan machine tools that it sells. These machines include the iconic Puma and Lynx lathe brands, and equally popular and successful DNM and Mynx vertical machining centres, and DBC horizontal borers.

This reputation is further enhanced by a range of quality services that are provided. Ask any customers why they invested in a Doosan machine tool from Mills and they will invariably mention the pre- and after-sales services as being an important and often decisive factor in their decision-making.

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Old meets new

How wire-cut EDMs two decades apart are working side-by-side

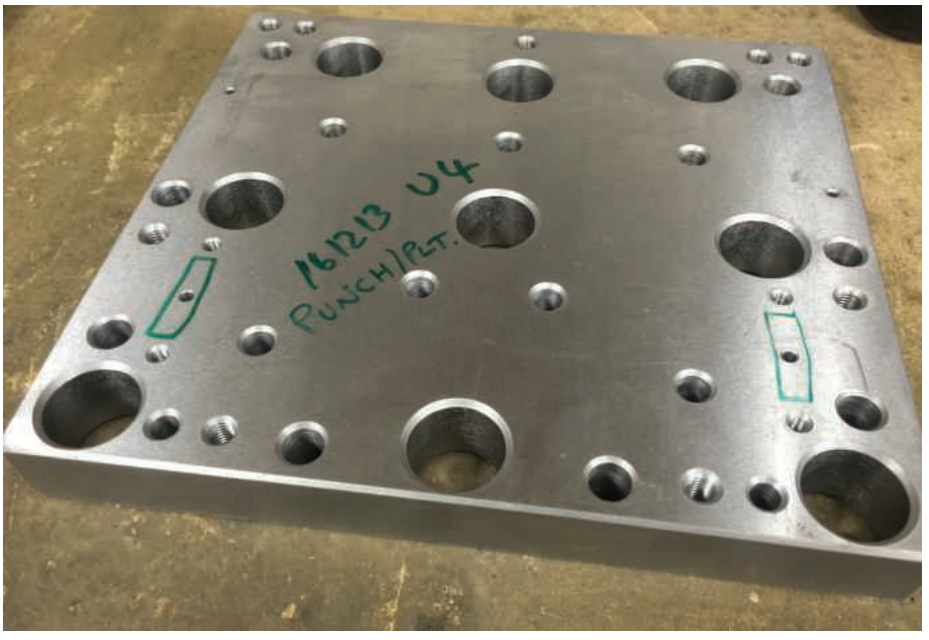
Alan Spargo Ltd is a subcontractor based in High Wycombe specialising in the development of bespoke manufacturing solutions. Established in 1975, the company offers two core services: a press tool service and a subcontracting machine service, which includes grinding, EDM/WEDM and CNC applications.

Operating in a competitive sector with many household names as clients, the company remains ahead by continually investing in the latest equipment and technology. Last year, it chose to invest in two new wire erosion machines, which would need to work alongside its existing FANUC machines, the oldest of which is around 20 years old.

Although the company was aware of the capability of the FANUC machines and was pleased with the work of its existing EDMs, it researched the market before making a final decision.

Director of Alan Spargo Ltd, Peter Spargo says: "Despite having 20 years' experience of working with FANUC machines, we fully investigated the marketplace when we began looking for new technology. However, the FANUC machines remained on top, so we stuck with what we knew."

Alan Spargo Ltd purchased two FANUC ROBOCUT 600iA wire erosion machines, a decision that was heavily influenced by the service, longevity and overall performance of the existing FANUC machines. However, as Peter Spargo explains, there were other factors that influenced the decision.



Peter Spargo continues: "When comparing the FANUC brand against other machine brands, one important factor was the level of accuracy that could be achieved. We do a lot of motorsport work and high-precision, multi-stage tooling, for which accuracy is critical. With the new FANUC machines, we can achieve tolerances of +/- 3 microns.

"Another factor was the reliability of the machines. The FANUC machines can be left unattended for unmanned machining because they will just keep running."

Another important consideration for the Buckinghamshire business was the compatibility and continuity of programming between the two older FANUC machines, and the new installations.

Peter Spargo says: "We could pull the programs from the older machines and use them on the new FANUC machines straightaway. Even after 20 years of working with the old machines, the team has found the transition easy.

"Furthermore, we can monitor the machines from a mobile phone or tablet when we aren't on the premises. This has been particularly useful for the guys who come in and out over the weekends to keep the machines running. When we are busy, we are probably running the machines for 400-500 hours a week, so uptime is critical to us."

Although the speed and accuracy of the new machines are impressive, the older machines still have a place at the subcontractor's 15,000 square foot facility.

Peter Spargo says: "The new machines give us great results, but our old machines still impress us. They were certainly ahead of their time when they were brought to the market 20 years ago."

Alan Spargo Ltd's work requires a high level of precision and accuracy and, with clients from a diverse range of industries, its machines must be able to keep up.

Peter Spargo concludes: "We are tasked with some difficult jobs using difficult materials and tolerances, especially in the motorsport and aerospace markets. The intelligence of the FANUC machines is terrific. It understands the materials and compositions and will often surpass its own parameters. For example, the machines will often complete jobs in eight hours instead of ten. What can I say, it's FANUC all the way."

At its state-of-the-art headquarters in Ansty Park, Coventry, FANUC UK brings together world-leading capabilities in industrial robots, machine tools and plastic injection moulding machines to facilitate the complete integration of factory automation systems for UK manufacturers.

FANUC UK works in partnership with FANUC Europe Corporation to provide a range of customer support services, including sales, product support, parts, repairs, and training, as well as development of bespoke engineering systems. FANUC UK is a subsidiary of FANUC Europe Corporation and employs approximately 107 staff.

FANUC is a leading global manufacturer of factory automation solutions using Computer Numerical Control (CNC) systems. From its international headquarters at the base of Mount Fuji in Japan, FANUC specialises in the development and manufacture of factory robots and automation machinery, including wire EDM machinery (ROBOCUT), high-speed milling machinery (ROBODRILL) and injection moulding machinery (ROBOSHOT). More than 400,000 FANUC robots are currently operating worldwide.

FANUC develops and manufactures all of its components in-house, and provides lifetime parts, repairs and support to its customers.

Based on more than 60 years of research, FANUC's CNC systems allow manufacturers to maximise their productivity, while minimising downtime. All FANUC systems offer high reliability, strength, control and precision. They are also equipped with intelligent energy management systems, which provide optimum performance using

the least energy possible. FANUC is a leading company in CNC systems, currently holding 65 percent of the market share in the global CNC sector.

FANUC was founded in 1956 by Dr Seiuemon Inaba. The corporation now has more than 2,000 robots working on its own lines, with more than 250 offices and 5,200 employees worldwide.

For more information on FANUC, or to see its current product range, visit: **www.fanuc.eu/uk/en**.

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Star solders its position for reliability after 25 years of 24/7 production

In 1984, Oglesby & Butler developed the world's first pocket portable soldering iron, giving engineers the freedom to solder joints in the field without the need to plug-in to electrical outlets. This brought about the birth of the Portasol brand, global expansion and the subsequent requirement for sliding head lathes from Star Micronics GB.

When the Portasol brand was in its infancy in the 1980s, the company was primarily assembling, packing and distributing its products, relying wholly on a subcontract supply chain. The considerable costs and performance of suppliers pushed the Carlow Company near Kilkenny to firstly buy plastic moulding machines that were soon followed by CAM auto turning centres for production turning of pins, caps, clips, end caps and tanks. However, the engineering manager at Portasol, Mike Griffin had a vision of introducing CNC technology as a potential replacement of CAM Autos and a trip to MACH 1992 changed everything for the Southern Ireland business.

Twenty years after visiting MACH and buying the first Star GB CNC sliding head lathe, an SR-20; the instigator of this change, Mike Griffin is still buying Star machines with the latest addition, an SR-20RIV Type B arriving in June.

Recalling the start of the 25 plus year journey of success with Star GB, engineering manager, Mike Griffin says: "We bought eight secondhand CAM Autos that were running 15 to 20 different copper and brass parts in series runs of 20,000 to 30,000. At the time, the CAM Autos were more productive than CNC sliders but they had to be continually manned and had excessive setup times. We gradually gained the confidence to run the first Star SR-20 lights-out, which made it more productive than the CAM Auto alternative. Additionally, we eliminated secondary operations as the Star had the flexibility to conduct cross drilling, threading and milling. This flexibility also meant the first Star SR-20 was also used as an R&D machine. Remarkably, that first Star SR-20 is still on the shop floor, running 24/7 after 25 years. It has now clocked up approximately 200,000 hours of production producing well in excess of 15,000,000 and is as reliable as it was on day one."

The first Star SR-20 was followed by a second machine within 12 months. The CAM Autos were soon wiped out and the 100-employee company now has nine Star machines that include an SW7, a 12 mm capacity SV, three SR-20 RIII machines and the latest SR-20RIV Type B machine. Over the last 25 years, each machine has been specified for a specific need with the SW-7 selected for particularly small parts up to 7 mm diameter, the SV-12 was selected for complex parts up to 12 mm whilst the latest SR-20RIV Type B was picked for its ability to conduct cross drilling and milling at angles.

Mike Griffin says: "Sliding head lathes aren't always associated with flexibility, but the Star machines have been phenomenal for our business. The early machines gave our design department the first real opportunity to incorporate design for manufacture. We went beyond the benefit of reducing subcontract costs, controlling processes and quality by bringing work in-house; the capability of our Star machines gave our engineers the ability to re-design the internal workings of our patented technology. This on-going process has reduced the number of components and the subsequent assembly processes and times."

The design for manufacture capability, the reduced stock-holding and lead-times, the improved productivity and component quality are just a few of the many benefits that Oglesby & Butler has witnessed since it started buying Star GB sliding head lathes.

Mike Griffin concludes: "Our product portfolio has expanded exponentially with hundreds of variations of different product lines. From a manufacturing perspective, this means we have to continually look at methods of how to remain flexible, efficient and above all productive. Star has certainly helped us along this path. The newer machines are at least 30-40 percent more productive than our first 25-year-old SR-20 that still churns out parts all day long."

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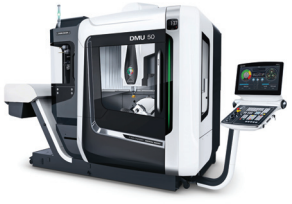
EMO 2017: Hall 26, Stand B19

Big increase in capacity for 5-axis machining centre

Now in its third generation and capable of simultaneous 5-axis metalcutting as well as 5-sided work, the DMU 50 machining centre from DMG Mori has been reintroduced with a significantly upgraded specification.

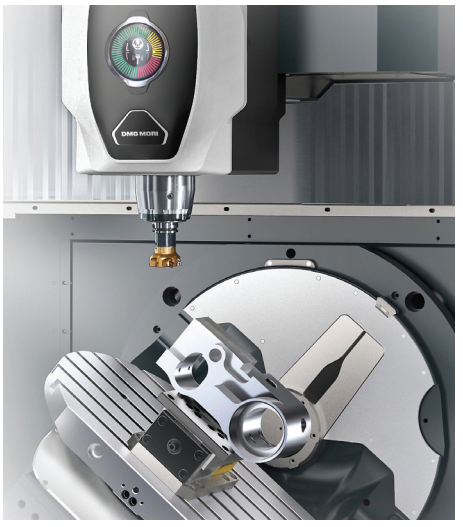
With linear axis travels of 650 x 520 x 475 mm, the machine has a working volume 78 percent larger than that of its predecessor, extending the range of parts that can be produced. Furthermore, the swivel of the rotary table, at -35°/+110°, represents an increase of 28 percent over the previous model, allowing more complex components to be machined. Productivity has also been raised, as rapid traverse is 42 m/min instead of 30 m/min.



The new, third-generation DMU 50 5-axis machining centre from DMG Mori has a 78 percent larger working volume than the machine it has replaced

There are 30 tool pockets in the standard magazine, although expansion of up to 120 pockets is possible. The user can choose either a 15,000 rpm or 20,000 rpm motor spindle. The table has an ergonomic loading height of 800 mm and accepts workpieces weighing up to 300 kg. The door to the work area is 876 mm wide, providing good access from the front even when automation equipment for workpiece or pallet handling is in place.

According to DMG Mori, accuracies of 6 µm and below can be held on the DMU 50, placing the machine ahead of others in its class on the market. Contributing to this level of precision are a one-piece machine bed and integral cooling of the guideways, drives and table bearings. Linear scales and angle encoders provide accurate feedback of axis positions. A 21.5-inch ERGOline with CELOS and Siemens 840D solutionline or a 19-inch ERGOline with Heidenhain TNC 640 can be specified as the control.



The -35°/+110°swivel range of the rotary table represents an increase of 28 percent over the previous model

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Hurco machining centre fits into tight spaces

A new subcontract machining firm has been set up near Coventry to undertake small batch manufacture and project work that other subcontractors and OEMs may consider a nuisance, as they interrupt production. Called Overstone Engineering, the company is owned by Richard Dunn who has 40 years' subcontract engineering experience.

The manufacturing facility entrance was the main issue when Richard Dunn was looking to buy a 3-axis vertical machining centre (VMC), as the door lintel is only 2.2 m from the ground.

After researching various options, he identified the perfect machine for his needs. It was the recently-introduced Hurco VM5i), which is less than two metres tall with the ram lowered and has a compact footprint of slightly over 1.6 x 2.2 m. It nevertheless has a generous working envelope of 457 x 356 x 356 mm.

The BT40 machine, which was installed and commissioned in January 2017, complements existing plant including a floor-standing laser profiler for prototyping and producing jigs and fixtures, a flat-bed CNC lathe with one metre between centres for turning parts up to 300 mm diameter, and a machine for 3D printing resin models.

Richard Dunn says: "I could not offer contract machining services during a two-year exclusion period after selling my previous company, Drurys Engineering in Hitchin. Now that I am free to re-enter the industry, I have chosen the Hurco VMC for its size and capability."

Overstone Engineering's target market is the design, production and assembly of items that invariably disrupt activities on other manufacturers' shop floors. Typically

they include machining of prototypes in ones and twos, small-volume milling and turning and electro-mechanical assembly. Additionally, the company provides advice and an engineering service to designers, entrepreneurs and inventors.

Shortly after the VMC was installed and training had been completed at Hurco's High Wycombe technical centre in a process described by Richard Dunn as painless, a contract was won for the production of a robotic test rig to be used for non-destructive testing in the aerospace industry. Overstone Engineering assisted in the design, working closely with the customer throughout all stages of the production, which included visits by its staff to the manufacturing facility.

A number of contracts were completed on the VM5i in the first five months of operation, involving materials from nylon and aluminium to phosphor-bronze and steels. The most recent was the production of a single assembly made largely of phosphor bronze for an unspecified application.

A majority of Overstone Engineering's work is programmed directly at the control using Hurco's conversational programming software. In this case, however, it was simpler to export a DXF file from Richard Dunn's OneCNC CAD package and use the DXF facility in the Hurco control to generate the cutter paths automatically.

Richard Dunn says: "Besides its compactness, another benefit of the Hurco machine is the high level of technology built into its control software. In addition to having the option of a module that allows native handling of DXF files, it can accept externally written G-code for milling 3D freeform surfaces.

"Ultimotion software was supplied as part of the package, giving fast, smooth, dynamic motion that is exceptional for such a low-cost machine and greatly helps to reduce cycle times and improve surface finish."

Throughout his career, Richard Dunn has accumulated a vast amount of engineering knowledge and experience in the aerospace, oil & gas, Formula 1 and security sectors in particular, to which his latest facility is well suited. He also has a long list of contacts in manufacturing companies from sole traders to multinationals and in the material supply chains. He is utilising many of these associates in his current enterprise.

Richard Dunn concludes: "Many in my position would have retired early, but I missed production engineering. So, I have decided to go back into subcontracting full-time and if it works as planned, I will offer an apprenticeship to an aspiring engineer so that I can pass on my knowledge."

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EMO 2017: Hall 12, Stand D84

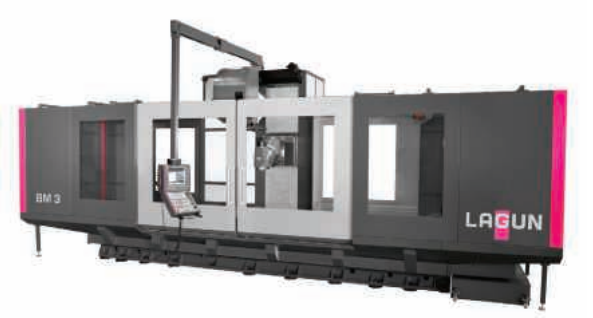
RK International agreement offers enhanced support for Lagun

RK International Machine tools has announced that it has entered in to an agreement with Lagun Machine Tools, S.L. to provide commercial and promotional support for Lagun's range of large capacity bed-type and moving column milling machines. Effective from the 1 June 2017, the agreement will provide both potential and existing users of Lagun machines with greater support as they will now have full access to the experience provided by RK International's sales and technical teams.

The agreement, which covers all activity in the UK and Eire, will see RK International driving the sales activity for the entire Lagun range and, providing support for existing customers through its extensive service/support activities, which benefits from many years' experience in working with large capacity machine tools.

Additionally, in the short/medium term RK International will also be able to call on the extensive knowledge of Mark Randall of Radius Machine Tool Solutions who, with over 16 years working with the brand, became the 'face of Lagun' in the UK.

Machines of particular interest to customers in the UK and Eire will be the BM bed mill series, with up to 5,000 mm by 1,300 mm by 2,000 mm of travel in the X, Y and Z axes subject to specification. There is also a variant with a rotating table with a weight capacity of 6,000 kg. Also featuring a rotating table is the new TM T series cross moving column milling machines, which has been developed with turning applications in mind. The rotating table is equipped with a high torque motor capable of achieving 400 revs/min with a capacity to machine parts weighing up to 5,000 kg.



The large capacity Lagun BM 3 series of bed mills

"In discussion with Mark and Lagun, it was apparent that customers were asking for greater support of the range and RK International's appointment as the UK and Eire agent for the range will deliver additional sales activity and also customer reassurance through the back-up and UK technical support that RK International's heritage of supplying large capacity machines can bring," says Simon Rood, RK's director & general manager. "This addition to the RK International Machine Tools' portfolio is an exciting one and, we are looking forward to developing the customer base for the Lagun range as we see many opportunities for this type of machine here in the UK and Eire."

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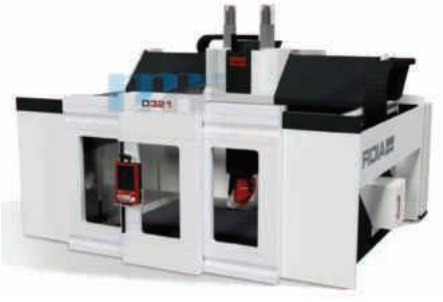
Compact gantry machining centre offers milling head options

The new Fidia D321 compact, gantry-type, high-speed machining centre offers a choice of proprietary Fidia milling head, continuous or bi-indexed, to suit specific mould finishing applications.

Available in the UK and Ireland from official importer, sales distributor and sales agent, TDT Technology, the fast and precise Fidia D321 matches a large working envelope of 3,000 x 2,200 x 1,100 mm in the X, Y and Z axes, with a notable compact footprint of just 6,000 x 6,000 mm. In addition, the wide-opening front door is ideal for loading large and heavy workpieces, while offering unsurpassed visibility.

Configured as an 'upper gantry' type machine with a moving cross beam, this design is proven to be the most qualified for stiffness and dynamic accuracy. A 3,000 x 2,000 mm cast iron, T-slot table is an independent part, fastened to the floor, and can accommodate loads up to 20 tonne capacity.

Fidia's M5B/22 bi-rotary indexing head is equipped with a 22 kW, 30,000 rpm HSK50E spindle that is ideal for the semi-finishing and finishing of plastic injection moulds as it combines an extreme compactness with high rigidity. Moreover, the use of a Hirth coupling with 3° step/pitch on the B-C axis allows for high precision even when using long tools to produce difficult-to-reach mould features. B-axis travel extends from +24 to -102°, with C-axis travel from +180 to -177°.



The alternative is Fidia's M5C/35 milling head with 35 kW, 20,000 rpm HSK63A grease-lubricated spindle. This fork-type head with continuous, high dynamics is tough and adaptable to a wide range of materials, including steel, aluminium, foams and composites. High-resolution direct encoders on the A-C axis grant accuracy even for the most delicate and demanding operations. The Fidia NC control allows continuous 5-axis interpolation and compensates the tool centre position according to the spindle inclination. A-axis travel extends from +95 to -110°, with ±200° in the C axis.

Fidia's D321 offers 24 m/min axis speeds and 3 m/s² acceleration in the linear axes, along with a 20- or 42-station automatic toolchanger. Tool lubrication and cooling takes place through an air-oil system using a minimum quantity of non-toxic vegetable oil. Air blow from the outside of the spindle can also be deployed. Grease lubrication is applied automatically to the recirculating ballscrews, guides and slideways.

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Using HRC Grippers with machine tools

Typically, robots used in manufacturing are kept in cages, to protect people working near them from getting hurt. According to many handling experts, this is now changing and that the direct collaboration of humans with robots will soon be an integral part of production automation in a few years. SCHUNK, the competence leader for gripping systems and clamping technology are working on "taming" grippers for collaborative scenarios, and for the production field. According to many experts, repetitive activities such as loading and unloading of machine tools will be gradually taken over by collaborative systems.

Employees are usually responsible for the management of several machines, such as raw and finished parts, and now collaborative robots are taking over the loading works. In contrast to conventional automated solutions with robots and protective fences, machine tools will be freely accessible during such collaborative applications. Individual orders and small series will be individually handled by the employee. Another field of application of collaborative systems is the handling of workpieces in health threatening areas, such as x-ray inspection of aluminum cast parts. The direct handling in radiation ranges of the x-ray machine can now be taken over by the Co-act gripper, before the component is handed over to the employee for individual post-processing and finishing.

Grippers with DGUV seal

According to SCHUNK, it will become more common in the future, to separate parts of a process and to divide the tasks between humans and robots. This applies in particular in areas where full automation will be difficult to implement or whether it is economically feasible. This particularly concerns applications, where the quantities are too low for a fully automated solution,

and which are too comprehensive for manual tasks or vice versa. HRC solutions bring decisive advantages for such scenarios: They increase productivity, ensure a high degree of flexibility, and reduce the employee's workload. Moreover, they reduce the risk of injuries and ensure constant quality of reproducible processes independent from the operator's daily condition. Following the underlying standards and guidelines, SCHUNK has defined three central principles for HRC grippers: First, a gripper will never cause injuries during gripping. Second, a gripper must always recognise contact with humans. Thirdly, a gripper must never lose the workpiece. Depending on the application, the innovative family-owned company uses different technologies and components for this purpose: the basic version of a so-called inherent HRC gripper includes a limitation of the gripping force, which is activated in situations of danger, and limits the gripping force to 140 N. In addition, a HRC compatible design with rounded corners and edges reduces the risk of injuries.

Moreover, in the future, it will be possible to equip the SHUNK Co-act grippers with additional features. Secure drives ensure that heavy parts are reliably held in the event of an emergency stop. An environment sensor permanently controls the environment of the gripper. Intelligent software evaluates the sensor signals and processes them. The safety directive for industrial robots DIN EN ISO 10218 is the basis for the SCHUNK Co-act series, and the aspects of the future DIN EN ISO 20218 are already been taken into consideration. Beside the SCHUNK SVH 5-finger hand, which is already certified and approved for collaborative operation by the German Social Accident Insurance (DGUV), certification of further SCHUNK co-act grippers will probably be finished at the end of 2017.

Sensory aura

The Co-act Gripper JL1, the world's first collaborative gripper, which directly interacts and communicates with humans, shows what is possible for the future. The HRC gripper was honoured in April with the coveted Hermes Award for its high degree of innovation. Provided by a sensory aura and an artificial intelligence, which is completely integrated in the gripper, the

Co-act Gripper JL1 is able to permanently collect information on the gripped component and its environment, to process them and to carry out situation-dependent reactions. An innovative kinematics, which allows a parallel and angular grip, ensures that part variants can be flexibly and alternately handled. Tactile sensors, which are integrated in the fingers, monitor the reliable grip, and ensure that sensitive components are not damaged.

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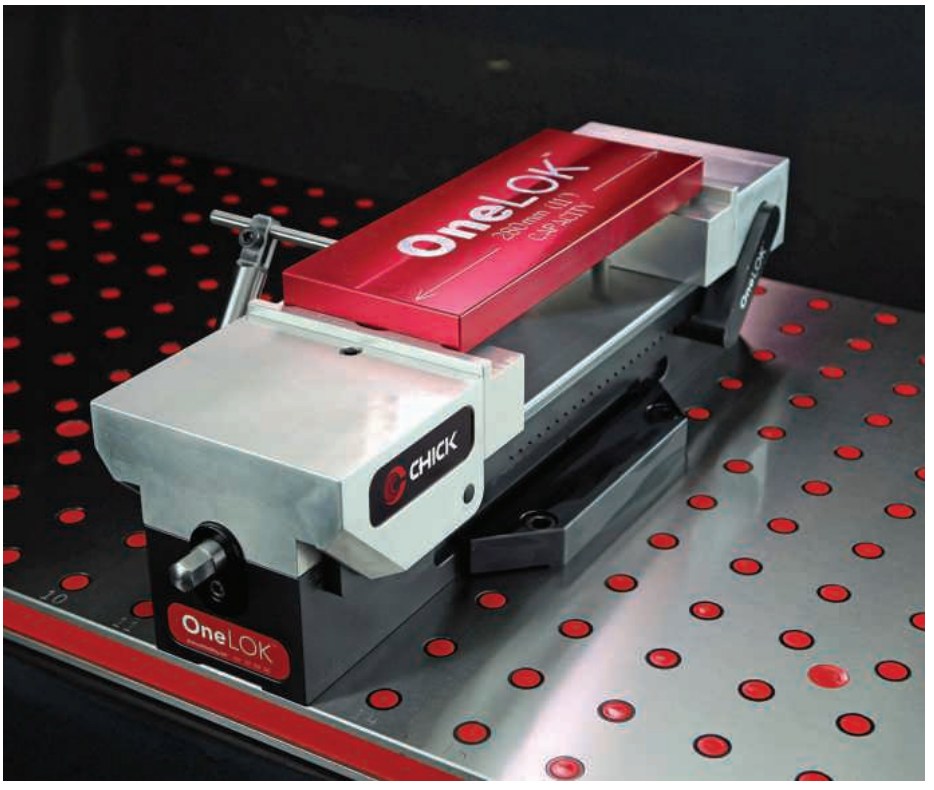
Additional workholding systems improve productivity and versatility

When Chick Workholding in the USA launched its One-Lok clamping system seven years ago as an alternative to the conventional machine vice, it introduced more precise workpiece positioning and a time-saving ratchet mechanism to adjust the position of the moveable jaw quickly. New lightweight versions have now been introduced to be marketed alongside it, offering users additional benefits. Availability in the UK is through sole agent, 1st Machine Tool Accessories (1st MTA) based in Downton, Salisbury.

The latest One-Lok is available in two sizes rather than one, 400 mm or 500 mm long, offering maximum gripping lengths of 180 mm and 280 mm respectively. Further improvements include a lowering of the clamp profile from 150 mm to 134 mm, which allows longer spindle travel in the Z-axis as well as approximately halving the unit's weight for easier handling. To this end, an ergonomic handgrip has also been added at either end.



Sometimes, machinists turn a vice through 90 degrees so that it lies transversely across the machine table. This can also bring the part closer to the operator, but has the disadvantage that there is no clearance for the handle. With the new One-Lok, workholding in this orientation, although there is little need, has been made easier by use of a ratchet handle.

The moveable jaw can be adjusted quickly and conveniently, as it can now be slid using one hand, rather than two, over the QwikSlide ratchets. A few turns of the handle move the jaw in the same direction over the last few millimetres to complete the clamping action very rapidly.

The existing BoltFast interface for the 152 mm wide, interchangeable hard and stepped steel jaws and aluminium soft jaws has been retained. A quarter turn of the locking screw is all that is required to exchange them, promoting productivity when machining small batches of components.

As before, machining accuracy is enhanced by the enclosed design, which discourages swarf from accumulating and by the mechanism's novel squeeze clamping action, which applies an equal and opposite force to both jaws and offers 20-micron repeatability. It provides virtually deflection-free component clamping with a maximum retaining force of 26.7 kN. On closure, the jaws impart a pull-down action to the workpiece for added security and precision.

Workholding "evangelist," Paul Swann, owner and president of Chick says: "With CNC plant costing six figures, you do not

want it standing idle while an operator winds a traditional vice handle up to 70 times to secure a part.

"It is important to remember that production efficiency when machining small batches is driven by the operator loading and unloading the parts, rather than by the machine itself.

"In developing the new, lightweight One-Lok design in two variants, we took on board comments from many of the thousands of people using the original model.

"Customers buying the new type can expect enhanced functionality and even faster payback, typically three months in an average job shop, based on increased output from expensive machine tools."

About 1st Machine Tool Accessories:
Offering a comprehensive range of top quality products at competitive prices, 1st Machine Tool Accessories is a leading supplier of workholding and machining accessories, including collets; chuck jaws; Kitagawa and Bison chucks, rotary tables and vices; Chick workholding equipment; Abbott and Leave fixturing and clamping products; Darex tool sharpeners; OK-Vises; Brighetti

reduction bushes; CoolJet high pressure coolant systems; Micromag filtration units; machine mounts; and Overbeck deburring twister lathes.

1st MTA's extensive stock holding is backed by excellent warranty and service provided by a dedicated team of technical engineers. Demonstrations of selected products are available from external sales specialists on request.

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Roemheld introduces new 5-axis vice to the UK

The new MC-P vice from Hilma offers high stability and precision combined with excellent accessibility and comprehensive chip protection. Its compact design enables collision free tool paths and the use of short, standard tools in 5-axis machining.

The MC-P 5-axis vice from Roemheld offers the precision and stability to enable first and second operation, Op10 & Op20, within a single clamping system. So, it is suitable for clamping long components as well as housings made of cast materials. It offers centering, clamping or balancing functionality and is suitable for a wide range of applications.

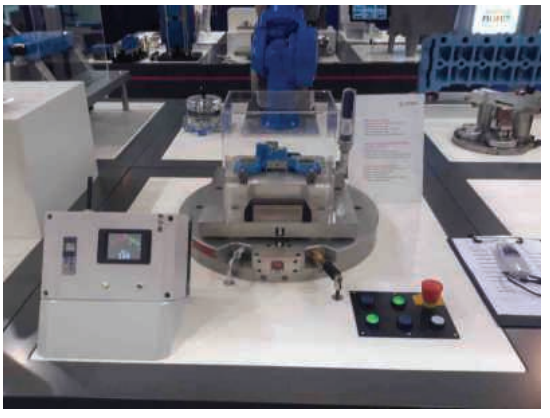
Mechanical and hydraulic versions are available and jaw widths range from 40 mm to 125 mm, with maximum clamping forces of 8 kN to 35 kN. The MC-P clamping system is extremely flexible and can be used with a wide range of accessories.

As a manufacturer, the Roemheld Group is constantly striving to improve its own processes through the development of new workholding elements. As such, the MC-P vice is an innovative addition to the current Roemheld 5-axis vice range.

Bringing sense to 5-axis clamping within Industry 4.0

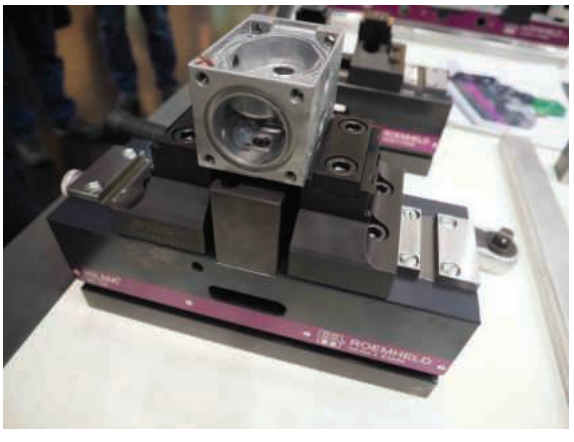
As a key innovator in Industry 4.0, Roemheld offers a wide range of products designed to support a 'smart factory' environment. These tackle the challenges companies face when looking to increase automation within the manufacturing process.

5-axis clamping can present particular challenges and so Roemheld has developed an electronic wireless pressure sensor. This offers stationary and mobile measurement of rotating or hard-to-reach sections of hydraulic clamping fixtures. Designed for use with automatic manufacturing systems, transfer lines, assembly lines and rotary indexing fixtures and tables, up to 16 pressure sensors can be individually configured and monitored from a single receiver. Ideal for applications where wired connections are impractical or too expensive, the wireless electronic pressure sensor uses radio transmission with a free-field indoor range of up to 300 m and an outdoor range of 60 m. The wireless electronic pressure sensor enables the pressure of single or multiple points to be checked simultaneously during start-up and maintenance with minimum installation costs.



The electronic wireless pressure sensor proved key to a research project that Roemheld collaborated on with the Manufacturing Technology Centre, based in the Midlands. The project involved running tests to measure the effects of centrifugal forces on hydraulic fixtures. So being able to use a wireless pressure sensor to monitor multiple, moving sections at the same time was extremely advantageous.

Scanning frequency is 0.5 - 20 seconds so pressure drops in hydraulic clamping fixtures could be identified in real time, helping to avoid tool breakage and resulting machine damage. Easy-to-install modules of battery-operated electronic pressure sensors have a radio transmission and a receiver unit. This enables pressures of up to 250 and 500 bar to be transmitted to machines and monitored at a distance of 300 m from up to 16 fixtures.



Roemheld is a leading innovator within Industry 4.0, having already developed a range of electromechanical tension elements including electric swing clamps. These are already in use in applications where hydraulics are not suitable. The company is also working on developing intelligent clamping systems that enable the actual workpiece to be monitored rather than just obtaining data from the spindle.

Terry O'Neill, managing director of Roemheld (UK) Ltd, says: "As a manufacturer of workholding products, Roemheld invests heavily in researching and designing technological innovations that are driven by customer need. We use our own products within our own manufacturing processes so we understand the changing demands of the marketplace. The wireless electronic pressure sensor is just one of Roemheld's many innovative electric products designed to support customers in their move towards the demands of Industry 4.0.''

Roemheld (UK) Ltd was founded in 1975 to supply innovative workholding solutions to the UK and Ireland. From its base in Hertfordshire, the company is proud to provide workholding and materials handling solutions to a wide range of companies from large OEMs down to the smallest of machine shops. It provides sales, service and ongoing technical support to customers across varied industry sectors.

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Deuce vices deliver flexibility, security and more parts per operation

YMT Technologies has been supplying vices and fixtures from the USA manufacturer 5th Axis for over five years, installing hundreds of its products in the UK market. Manufactured at 5th Axis' headquarters in San Diego, the designs for its workholding products originated from its own requirement for fixtures for efficient and economic manufacture of the wide range of aerospace, military, medical and commercial products it produced. Now, 5th Axis is a major supplier of workholding equipment in the USA.

Just launched in the UK by YMT Technologies, is the Deuce range of vices. These feature the tried and tested dovetail technology which is used across the whole range of 5th Axis' vices. Simple, secure and reliable workholding is achieved by machining a dovetail form in the edge of the material during the blocking up operation using the special dovetail tool supplied by YMT Technologies. There is no costly equipment required to form a profile for clamping and no extra handling. The dovetail technology is well known for its secure clamping capabilities, on as little as 1.5 mm of material, enabling more aggressive machining strategies to be used with confidence. For soft materials such as aluminium, the top edge of the dovetail groove on the vice has a crimping pattern so, for lighter machining applications, there is no need to perform the dovetail machining operation.

The new Deuce vice comes in two sizes the DV56 which clamps parts up to 152 mm and the DV510 which clamps parts up to 254 mm. Both vices have a clamping force up to 4,000 lbs and a jaw length of 127 mm. A knurled screw quickly closes the vice ready for final tightening with a torque wrench, speeding up vice loading.

Fitted with a removable centre jaw, the vices can clamp four components simultaneously, doubling their potential capacity, and the quick-change jaws can be changed without dismantling the vice. Jaws can also be reversed for extra capacity and options include double station soft jaws. These features enable more parts to be machined in one setting increasing productivity while maintaining flexibility.

Drop Lock quick change accessories make it possible to remove and replace vices in seconds. Furthermore, multiple vices can be quickly and easily be located on the machine table or on a tombstone to maximise machine capacity.

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Robo-Trex makes light work of Qualiturn lights-out milling

Equipment such as barfeed mechanisms have enabled businesses involved in turning operations to work in highly efficient lights-out modes for some years. Now, the availability of advanced automation aids, such as the Lang Robo-Trex system from Thame Workholding, are allowing forward thinking businesses to operate milling machines unmanned for extended periods. One such progressive company is Hertford based Qualiturn Products.

Founded in 1974, over the past four decades Qualiturn Products has developed into one of the UK's leading suppliers of precision mill-turned components. In 1990 the company became one of the first UK subcontractors to instigate a lights-out mill-turn machining regime throughout each night shift. Since that time, the business has operated 24 hours a day, seven days a week, 365 days a year, with only daytime staffing.

Now run by second-generation managing director, Nick Groom, Qualiturn's extremely efficient 24/7 operating system, the use of highly productive machine tools and the work of the company's skilled staff, results in the supply of high-quality components at competitive prices.

In 2014, the success of Qualiturn Products' 24 hours a day, seven days a week manufacture of precision turned components, prompted the company to establish Qualimill, a subcontract milling

division that embraces the company's successful lights-out operating methods. Substantial investments in the latest milling machines and automation technologies have resulted in Qualimill becoming an extremely successful sub-contract manufacturer of milled components. Ever rising demand for Qualimill's output has led to further investments in innovative production aids that support the company's lights-out production philosophies; not least Qualimill's recently installed Lang Robo-Trex advanced automation system.

The Lang Robo-Trex robot system feeds a Doosan DNM500 machining centre from two trollies. The trollies serve as mobile storage mediums for multiple vices that hold workpieces ready to be loaded into the machine, depending on the part sizes involved, each trolley is able to store up to 42 loaded vices. The highly efficient Lang Robo-Trex system uses an articulated robot with a handling gripper that is capable of loading and unloading workpieces of up to 12 kg.

Fed by the Lang Robo-Trex, the Doosan machining centre runs throughout the day shift. The system's trollies are simply pre-loaded with parts to be machined by Qualimill staff, in an area remote from the machining centre, then pushed into place. Following a machine cycle, each finished part is returned to a trolley; when full, the trolley is wheeled away and a second trolley loaded with workpieces is added. The flexible system ensures that no machining downtime is experienced. Before the end of daytime production the Robo-Trex trollies are replenished with workpieces enabling the Doosan machining centre to run in a highly efficient lights-out mode throughout the night.

Robo-Trex trollies are available in two sizes, the first has a capacity of 30 vices, maximum part size: 120 x 120 x 100 mm, whilst the second model has a capacity of 42 vices, maximum part size: 120 x 100 x 70 mm. The Robo-Trex system is able to handle four automation trolleys. Therefore, depending on part size, the available storage capacity increases to 120/168 vices.

The patented, edgewise mounting of the system's vices ensures maximum space utilisation, whilst accessibility to the clamping device allows workpieces to be exchanged, without removing the vice.

An intuitive, easy to operate touch panel enables easy control of the automated system and as external access to the trolley is possible, production remains seamless as machining cycles do not need to be interrupted. Control of the zero-point clamping system can be performed either pneumatically through the machine tool, or mechanically through the system's robot.

Explaining the reason for purchasing the Robo-Trex system, Qualiturn MD Nick Groom says: "Having been motivated to launch our Qualimill division by strong demand from our loyal mill-turn customers, we have now applied our tried and tested working practices to our milling operations.

To help satisfy the rising demand for our milling work we recently considered purchasing another high-yield CNC milling machine. Although, inspired by the successful lights-out operating methods we employ in our mill-turn operations, we explored the technology that would allow efficient lights-out running of an existing CNC milling machine. We found the ideal answer in the Lang Robo-Trex automation system from Thame Workholding.

"As the first company in the UK to install the new Robo-Trex system, we have continued our steadfast commitment to embracing cutting-edge, highly efficient production equipment and methodologies. Having previously enjoyed the benefits of other Lang workholding systems supplied by Thame Workholding, we already had great confidence in the quality of Lang products. After viewing a video of the Lang Robo-Trex automation system in action and recognizing the highly efficient lights-out advantages it would deliver, we calculated our anticipated ROI and decided that the system was a more cost-effective method than purchasing another CMC machine tool.

"Our Robo-Trex now feeds a Doosan DNM500 machining centre in our Qualimill subcontract milling department and gives us highly efficient lights-out production capabilities. The great success of our Robo-Trex automation system means that we already have plans to install a second system."

Thame Workholding sales manager Gareth Barnett concludes: "In addition to supplying a wide range of cost-effective, standard and bespoke in-house manufactured workholding systems to our international customer base, we also offer a range of highly efficient workholding solutions from several of the world's leading manufacturers. Thame Workholding's experience and expertise in the field and our access to a comprehensive range of workholding solutions allows us to fully understand our customers' needs and to provide optimum workholding solutions to them.

"Our grasp of Qualiturn's lights-out working objectives for the company's subcontract Qualimill milling department, enabled us to recommend the Robo-Trex automatic handling system with great confidence. Following its installation, the advanced automated system is now enabling highly efficient lights-out milling operations throughout each night and it has released the latent productive potential of the machine tool it serves."

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Tool presetting with HAIMER quality

With the acquisition of Microset GmbH, the HAIMER Group has become a complete system provider for tool management around the machine tool. The Microset tool presetting devices meet the high-quality standards of HAIMER and cover the needs of almost all machine operators. HAIMER Microset GmbH is located in Bielefeld.

Successful machining requires powerful machines and highly-precise tool holding technology, which ensures that the precision is transferred from the spindle right to the cutting tool edge. Within the last couple of years HAIMER, a European market leader in the area of tool clamping technology, has become the complete system provider for tool management. Managing director and president of the Haimer Group, Andreas Haimer summarises the development:

"After the recent acquisition of Microset GmbH from DMG MORI and the expansion of our product portfolio we are now able to offer the entire process chain from one single source."

For him it was especially important that the Microset presetting devices meet the very high-quality standards of HAIMER. Andreas Haimer explains that there is absolutely no doubt that the quality is met because "all Microset machines, starting with the entry-level models up to the fully automated measuring machines, distinguish themselves through first-class hardware, ideal ergonomics, as well as easy handling. They are supported by a stable cast iron base construction which reduces the need for frequent calibration and helps subsequent problems in the production environment.

Premium machines with linear drive

One highlight from the comprehensive product portfolio is the VIO linear series. According to HAIMER, it is the only machine series on the market with a linear drive for efficient and highly precise presetting of drilling, milling and turning tools. The direct drive within the x- as well as z-axis offers the user a very dynamic positioning precision and reliability of even the largest tooling. The repeatability of +/- 2 µm indicates the high degree of quality inherent in these machines. The increased speed of linear drive can guarantee a productivity increase of up to 25 percent during the measuring process, all at a very good price performance ratio.

All machines in the HAIMER Microset VIO series have a modular design to cover a wide spectrum of needs. Tools that weigh up to 160 kg and have a diameter and measuring length of up to 1,000 mm can be measured. Depending on your needs the devices can be upgraded to fully automated CNC measuring machines with integrated HAIMER shrinking technology. The unique design ensures ergonomic functionality for ideal ease of use for the operator. This applies both to the spindle access as well as the central control panel.

The innovative one-hand-operation makes it possible to manually or automatically measure the axes and guarantees a µm-precise fine positioning. Finally, maximum quality during the manufacturing process is achievable through fast and exact measuring with the image editing software Microvision VIO. Tool measurement is even easier with the help of the large high-resolution flat screen monitor.

Even simple devices deliver highest precision

With the HAIMER Microset UNO series, the focus lies on precise tool presetting as well as consistent performance. Due to the many different options the UNO series offers, price-performance ratio is very good. Next to a Touch-Display, RFID-Chip-System and post processors for all conventional control systems, the equipment options also include upgrades such as autofocus or automatic drive. The difference between the UNO autofocus and the manual version is the ability to automatically focus on the cutting edge with a CNC control system in the

C-axis. For tools with many cutting edges, this option is a proven time saver. Furthermore, the automatic drive version independently positions the different planes in the Z-axis and automatically approaches the X-axis. The user does not need any special skills, because with the push of a button the machine independently measures complex tools with multiple cutting edges and levels. If required both versions can also be operated manually like the standard model.

The UNO series machines are available in two different sizes: the UNO 20/40 has a maximum tool length of 400 mm on the Z-axis, while the UNO 20/70 has a maximum tool length of 700 mm. Both versions are available as table devices with a 19" flat screen. A 22" or 23" touch display and comfort system cabinet are also available as an option.

By using the snap gauge method, even the standard models offer the possibility to measure tools with a diameter of up to 100 mm. With the use of spindle adaptors that configure to the base SK50 taper interface, it is possible to also use most popular interfaces such as HSK, Capto, VDI, KM or BMT.

Thermally stable cast iron construction

The FEM optimised and thermostable cast iron construction is the solid foundation of the Mircoset tool presetting machines. The extremely rigid base unit with a 3-point-support system provides stable and safe positioning of the machine and ensures an overall easy setup for the highest possible flexibility in production. Additional features such as visual inspection camera mode and optional "infinite fine adjustment" further enhance the functionality of the machines.

With its release-by-touch, function (an intelligent sensor control to measure the X- and Z-axis) the UNO series is setting new standards for entry-level tool presetting machines by making them easier than ever to use. Microvision UNO offers the operators intuitive functionality that produces very precise measuring results. A precise focus window enhances the accuracy and even provides accurate measurement values for the most complex tools. The UNO series is rounded off with options like a thermo-label printer, a vacuum clamping system, a second camera for presetting stationary turning tooling and a highly precise ISS spindle with direct clamping adapter (2 µm accuracy).

Andreas Haimer summarises: "Microset offers a high-performance alternative and solution to every customer who wants to purchase something new in the area of presetting technology. Even if your presetting room is currently equipped with other technology, it definitely pays off to purchase new presetting devices whenever you invest in new machines. This way you can prevent long waiting periods and also avoid machine breakdown. The easy and intuitive operation of the machines guarantees that even in a three-shift operation the devices can be operated by every single employee. In short, in order to use the Microset devices, you don't need to be trained for weeks in advance and you don't need to place them in an air-conditioned measuring room to get repeatable results."

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EMO 2017: Hall 4, Stand E18

Subcontractor gets a grip on precision

When Parker Precision set itself on a course to improve productivity, precision and output, the Bilston business acquired a Mazak QuickTurn 200MSY turning centre equipped with a Hainbuch collet chuck. The impact of the new investment soon snowballed into a raft of new machine purchases.

Installed in 2012, the Mazak was purchased for its sub-spindle turning capability with the aim of reducing second operations, part handling, potential for error and of course improving throughput. The impact of the Mazak QuickTurn rapidly noted the arrival of a second 200MSY, a 250MSY and a Hyper Quadrex, all fitted with collet chucks from workholding experts Hainbuch. In addition to this, the AS:9100 certified manufacturer has purchased three sliding head turning centres from Star and a 5-axis VariAxis i500 machining centre.

Commenting upon the delivery of Hainbuch Spanntop Combi collet chucks with the Mazak machine tools, Marc Corns, director at the 28-employee subcontract company, says: "When we set about replacing machine tools with new technology, the 'done in one' slogan from Mazak caught our eye as we were intent on getting parts off the machines with no operator intervention. However, our concern was transferring complex parts from the main to sub spindle and maintaining our average +/-0.01mm tolerances on dimension and concentricity precision. To this end, Mazak recommended a Hainbuch 65 mm diameter Spanntop Combi collet chuck for the sub-spindle. This worked so well on the first machine, we specified the Hainbuch collet chucks on the sub-spindle of every subsequent machine installation."

Manufacturing anything from critical electrical housings for the petro-chemical industry to actuation components for the aerospace industry, the subcontractor is registered on the UTC 'gold program', which signifies the importance the family owned West Midlands company places on quality.

Mark Corns says: "Initially we were confident in the machining precision of the Mazak machines, but somewhat apprehensive of the dimensional consistency between front-end and back-end machining. Hainbuch has more than delivered in terms of maintaining repeatability, precision and concentricity levels."

Machining batches from 20 to over 200 on the manually loaded chucking machines, the clamping forces, concentricity, accuracy and ability to delicately hold machined surfaces without marking the parts were all considerations for Parker Precision. These considerations were all overwhelmingly solved by the Hainbuch Spanntop Combi dead-length collet chucks. The components machined at Parker Precision are particularly challenging with considerable and often heavy duty milling operations on materials that vary from steel through to titanium, Monel, beryllium copper and much more. Not an issue for the Hainbuch range.

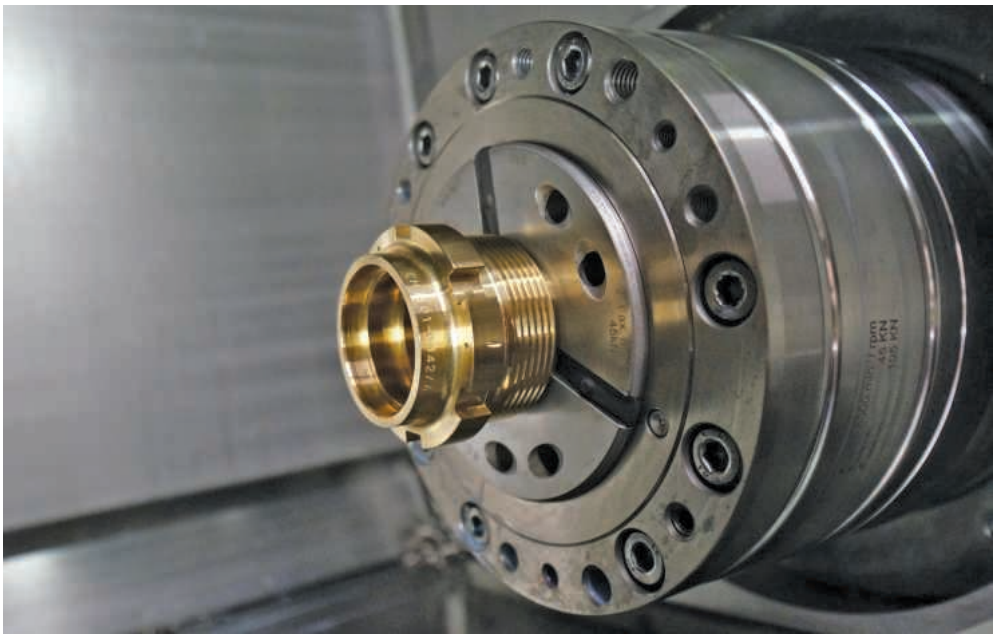
Reflecting upon the previous turning centres and the efficiency of the machines, Mark Corns says: "It is difficult to establish a quantifiable gain with the Mazak machines over their predecessors. The ability to conduct one-hit machining as opposed to continuously using secondary operations is huge for our business. It has slashed cycle times, manual handling, lead times and it has given us more capacity to take on new work. Added to this, there are major benefits in terms of quality, precision, consistency and the reduced opportunity to create scrap. The Hainbuch Spanntop Combi system is a major contributor in all of these factors. One thing we can certainly quantify with the Hainbuch system is the savings in regard to collet changeovers. Our previous 5C collet system on the old machines used to take up to 30 to 45 minutes to change over. This creates a lot of down time and lost machining hours when we are changing components over with regular frequency. The Hainbuch Spanntop Combi enables us to change from one component or diameter to another in less than 10 seconds. This is a huge saving."

This flexibility is afforded by the ability of the Spanntop Combi to conduct radial clamping without axial movement of the clamping head as well as the flexibility to clamp workpieces with a short collar or shoulder length. By applying axial draw force to pull the components against the end-stop, the workpiece and the process is made considerably more stable.

This is credit to the extremely high clamping forces that guarantee component stability. The benefits of the Spanntop Combi dead length chucks on the sub

spindles at Parker Precision has since resulted in the company also changing many of the main spindle chucks to Hainbuch products.

David Noakes, engineer at Hainbuch, concludes: "The Spanntop range of chucks have made an instant impact for Parker Precision. To bring these benefits to the complete process, we have now installed Spanntop Combi chucks on many of the turning centres, which give flexibility by allowing adaptions such as our 'Mando' mandrel system and our 'Jaw module' three jaw chuck adaption which are both quick change and zero point to maintain sub-micron accuracy.''



For 60 years Hainbuch has been constantly developing new clamping solutions focusing on customers essential requirements: setup times and cost savings, flexibility, productivity, energy efficiency and security. Everything that customers expect from clamping solutions. Its products have these essentials including CE certification and the promise to be environmentally friendly.

Quality is very important to the company and is an essential part of its corporate philosophy. This is evident not only from its multiple certified ISO 9001 certification, but incorporated into the products. But that's not enough. Hainbuch wants to develop and produce not only a high quality product, but a product that is environmentally friendly and sustainable

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EMO 2017: Hall 3, Stand C72

Plunge milling ingenuity from WNT

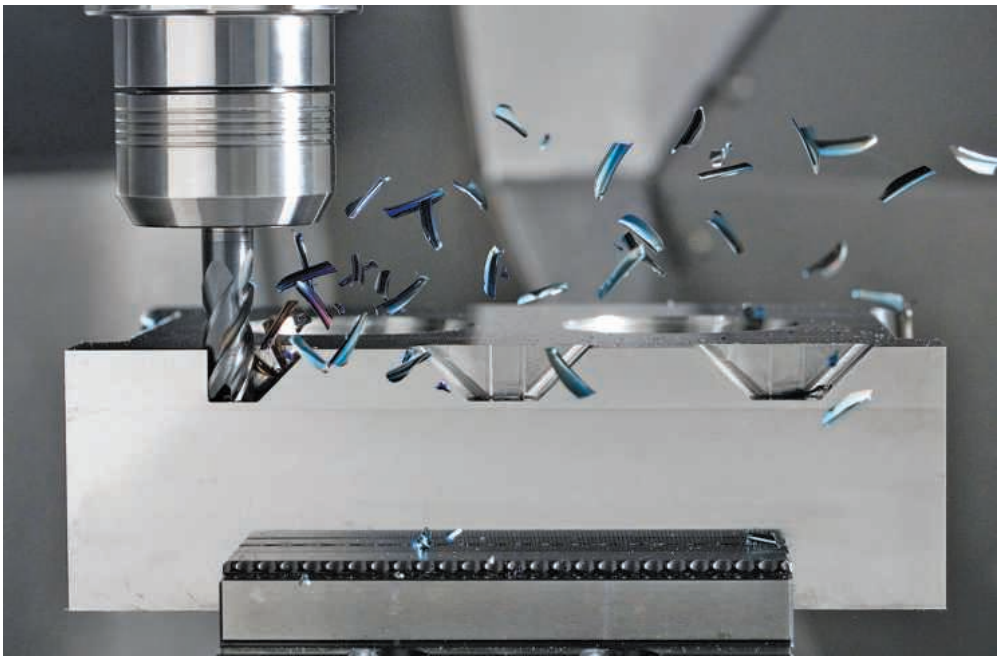
WNT's latest solid carbide milling development, the Monstermill PCR UNI, enables precise, process-secure, ramping/plunge milling at high angles or with extreme chip volumes during full slot milling. This provides a new milling solution thanks to its innovative geometry, four flute design and patented centring tip. The design delivers powerful and extremely quiet milling across a range of materials including steel, stainless steels and cast iron.

With the MonsterMill PCR UNI, WNT brings an immensely powerful tool to the table that will enhance machining capability, allowing customers to experience a new world of milling. Not only does the PCR cutter excel at roughing and finishing, it is also a master of vertical plunging. The MonsterMill PCR UNI's four cutting edges give it a significant advantage over conventional plunge milling cutters with only three, as it can achieve feed rates that are up to a third higher. For ramping/plunging, slotting and profiling operations feed/tooth rates of up to 0.137 mm/rev are also possible.

Despite the high cutting speeds afforded by the PCR UNI, the cutters also achieve high process security thanks to the special core geometry that has been designed to break chips and prevent spiral chips forming during plunging and drilling. Thanks to the reliable swarf removal via the flutes, therefore the elimination of chip jams a more secure machining process is achieved.

Daniel Rommel, WNT product manager, says: "We've compared the MonsterMill PCR UNI with two competitors. One of the plunge milling cutters did not break the chip at all and long continuous chips were formed. With the other milling cutter, drilling was only possible to a limited extent and a large built-up edge formed. With the MonsterMill PCR UNI we witnessed excellent chip breakage and process-secure chip removal at higher feed rates."

The cutter design also creates a quieter cutting process, thanks in part to the irregular flute pitch and helix angle on the milling cutter. This has the effect of preventing the tool from oscillating and starting to vibrate, even when high ramping angles of up to 45° are being used, without reducing feed rates. Another feature of the PCR UNI cutter is its ability to ensuring a stable process and maximum precision during angled ramping up to 90°. This is achieved thanks to the patented 142° centring tip in the centre of the end cutting edge. It also means that rapid centring is possible without having to perform helical milling in advance.



Drilling, centring, milling. The MonsterMill PCR UNI from WNT combines three tools in one and, thanks to its four cutting edges, offers maximum performance and feed rates per tooth of up to 0.137 mm/U

Daniel Rommel explains: "If users need to make a hole on a sloping surface, they previously had to mill down in a helix to 1xD so that the drill is then guided laterally. Thanks to the centring pin of the PCR UNI, this process has become a thing of the past. There are also advantages when helical milling due to Monstermill PCR UNI's high ramping angle of up to 25° for helical drilling. With the conventional method, it took 25 minutes to drill 100 holes, 10 mm diameter, but with the MonsterMill we managed it in only eight minutes and therefore trebled the level of performance."

In developing MonsterMill PCR UNI WNT has produced a true all-round cutter that exhibits high chip removal rates during roughing with four cutting edges and achieves excellent surface finishes as a finishing cutter. Users benefit from its very quiet running, stable and precise machining processes, plus the ability to achieve angled plunging, rapid centring owing to the patented centring tip and vibration-free ramping up to a ramping angle of 45° at elevated cutting data.

Anyone wishing to test the qualities of the new MonsterMill PCR UNI can call the free service line on 0800 073 2073 to speak with the machining specialists at WNT or, arrange a face-to-face meeting with their local WNT technical sales engineer.

The WNT Group is a sales organisation supplying precision cutting tools to the metalcutting industry. Through optimal service and an unbeatable product quality WNT is the ideal purchasing solution for the metal cutting industry. The company is successfully represented internationally in 19 countries and has its headquarters in Germany. It is part of an international group of companies with more than 5,800 employees worldwide.

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EMO 2017: Hall 5, Stand B70

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ISCAR's Matrix enhances Benham's efficiency

Benham Precision Engineering manufactures complex components and assemblies for the global aerospace, defence and oil and gas sectors from two locations in the South of England. The company also undertakes electro-mechanical, and mechanical assembly of piece part components, including the testing and kitting of parts.

Benham continuously invests in the latest production equipment and now boasts an impressive plant list, including a wide range of Mazak 5-axis CNC milling, CNC turning and mill turn machine tools. To help realise the high-yield potential of its advanced machine tools and to enable the efficient manufacture of premium quality parts, the company employs a range of progressive, time saving processes within its progressive production regime.

The latest CADCAM software enables offline programming of production parts to model, whilst the generation of pre-production process control plans ensures that efficiency is engineered into every aspect of Benham's manufacturing processes. Also, to minimise machine tool downtime and to help boost production, all cutting tools are accurately pre-set off-line.

A major factor in Benham's highly-efficient production organisation is the company's use of ISCAR Tool's ingenious Matrix tools store system. Managed by Benham's local ISCAR distributor, the use of Matrix ensures the instant availability of the correct cutting-tool where and when needed.

Benham's close relationship with ISCAR began several years ago. With the intension of increasing machining efficiencies, reducing its cutting tool inventory and streamlining its cutting tool ordering system, the company undertook a review of the company's entire tooling structure and process optimisation techniques.

ISCAR's cutting tools were compared to competitors' products in terms of tool life, price and machining time advantages. The results of each of these important comparisons were translated into both machining costs and into actual savings per part. On completion, the trials delivered a number of positive results and proved the major advantages Benham could gain by its increased use of ISCAR cutting tools.

Joe Benham, commercial and projects manager for Benham Precision Engineering, says: "Although the reasons behind Benham Precision Engineering's continuing growth are numerous, our philosophies of pursuing maximum machining efficiencies and of developing close commercial and technical partnerships with our suppliers are key factors in our success. For instance, in addition to the close relationship we have with our main machine tool supplier, Mazak, we also enjoy a similar connection with ISCAR UK.

"Our adoption of ISCAR's flexible cutting tools resulted in a significant reduction in the category of tools we use. We have also enjoyed the benefits of faster cycle times and increased machine tool productivity. Also, the long-life nature and cost effective price of ISCAR's products has ensured that our cutting tools costs have been slashed.

"Following our adoption of ISCAR as our main cutting tool supplier, we soon installed our fist ISCAR Matrix, computerised tools storage system. As the use of our original Matrix system delivered the kind of efficiencies that we were looking for, we have recently installed a large number of additional Matrix units throughout both of our production sites.

"As they share a common database, the company wide expansion of our Matrix units, means that we now have a single, all-embracing system that ensures we constantly have the correct cutting tool available for every forthcoming job.

"Our expanded Matrix system dovetails

perfectly with our existing production systems. We have programmed Matrix-TM, the ISCAR management software module with minimum stock levels for each category of tool. When this critical level is reached an order is automatically generated, delivered and installed into the appropriate cabinet by our local ISCAR distributor. ISCAR's Matrix system has proven to be an invaluable tool in our pursuit of machining efficiency and cost savings."

Matrix is an advanced computerised, total tool management system that gives users absolute control over their cutting tool inventory. In addition, the system streamlines tool purchasing functions and drives down users' costs.

ISCAR's Matrix system combines an automated tool dispenser with Matrix-TM, a powerful, yet easy-to-use management software module. Access to any item stored within the system's locked bins is electronically controlled by Matrix' advanced management software and is swipe card or finger print activated with entry determined by pre-defined authorisation.

The modular Matrix system is extremely flexible and adaptable to all users' needs. Drawer configurations can be swapped-in or out, whilst add-on cabinets are able to be connected with a click cable. Multiple cabinets can be deployed together or located in several different locations and networked into a single system, enabling each of the cabinets to share a single, common database. Advanced Matrix technology includes a patented locking system to prevent unauthorised access, a large hi-resolution, touch-screen operator interface, plug and play 'smart' electronics and a remote diagnostic capability. A barcode reader is used for rapid and reliable tool issuing, whilst a manual system override is included enabling easy access in the event of situations such as power failures.

Suitable for both small and large organisations, with single or multiple sites, ISCAR's ingenious Matrix system ensures that every required tool is always instantly available. Now an extremely popular ISCAR option, Matrix has proven to help reduce tool inventories, minimise machine downtime and to cut production costs.

ISCAR's Matrix vending solution is able to act as a stand-alone, computerised tool management system, or the system can be integrated into a tool assembly and pre-setting arrangement, as used by Benham Precision Engineering.

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EMO 2017: Hall 4, Stand E36

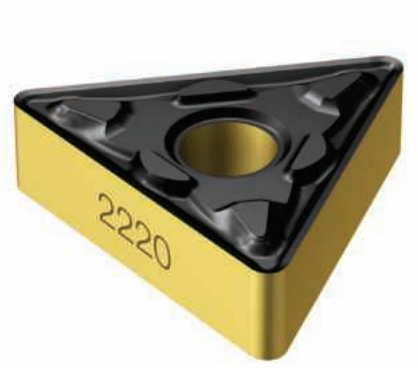
Turning grade gets firm on plastic deformation

Tool life and productivity enhanced in stainless steel applications

Cutting tool and tooling system specialist Sandvik Coromant is introducing a dedicated turning insert optimised for stainless steel materials that offers increased productivity, longer tool life and higher machine utilisation. GC2220 will prove to be a major benefit to pump and valve manufacturers, as well as general engineering shops, particularly those serving sectors such as aerospace, automotive and oil and gas.

In response to common challenges associated with turning stainless steel workpieces, GC2220 has been designed to offer higher resistance to plastic deformation and provide greater edge line security. Plastic deformation takes place when the tool material becomes soft, typically as a result of elevated cutting temperatures. If a manufacturer is only machining two components before the insert needs to be replaced due to plastic deformation, then both productivity and profitability become compromised.

GC2220 is a CVD-coated gradient sintered carbide that is designed specifically for semi-finishing to rough turning under stable conditions where higher wear resistance is required. Inveio™ coating from

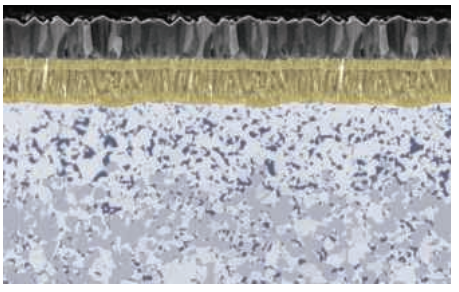


Sandvik Coromant is deployed to provide unidirectional crystal orientation in the alumina coating layer, delivering higher levels of wear resistance and tool life. This advanced and proprietary technology is supported by a columnar MT-TiCN inner coating that is hard and resistant against abrasive wear. As an added advantage of longer tool life, machine shops will be able to reduce their cutting tool inventory.

Customers set to benefit from this new grade are essentially any manufacturers tasked with external and/or internal turning operations in austenitic and duplex stainless-steel components such as pump housings, axles, shafts, seals, valves and flanges. Further materials where the attributes of GC2220 will prove advantageous include martensitic stainless steels and low carbon steels.

Bimal Mazumdar, product manager for turning at Sandvik Coromant, says: "By way of best-practice advice, customers should select the largest possible nose radius and always use coolant to decrease crater wear, notch wear and plastic deformation. In addition, be sure to choose a dedicated insert grade for stainless steel to increase both tool life and production."

GC2220 is available for CoroTurn® 107 inserts, which are designed for the internal and external turning of small or slender components, CoroTurn TR for external profiling and T-Max® P for general turning applications.



Find out more at:
www.sandvik.coromant.com/en-gb/products/turning-inserts-grades-stainless-steel

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3,100 patents worldwide, employs over 8,500 staff, and is represented in 150 countries.

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EMO 2017: Hall 5, Stand B18

Performance of Mirage tools is no illusion

It's considered a rarity to find a series of end mills capable of generating extremely high performance whilst offering the ability to machine a vast array of materials, until now. Quickgrind has launched its new Mirage Series of solid carbide end mills that outperform competitor products on stainless steel, super alloys and a selection of non-ferrous, high temperature alloys and cast iron.

As well as offering blistering performance on a variety of materials, the new Quickgrind Mirage series has an ingenious geometry that allows end users to apply the Mirage to roughing, finishing, slotting and profiling as well as trochiodal milling and strategic HSM processes. This extensive capability reduces tool inventory and costs. The cost benefits can be extended with Quickgrind's remanufacture service that recoats and regrinds tools to as-new condition.

The Mirage series enables customers to increase speed and feed rates to improve material removal rates beyond existing parameters whilst also suppressing vibration and extending tool life. All this is credit to a tool composition that consists of a force resistant sub-micro grain carbide that is layered with Quickgrind's unique X-Red coating technology. Whilst the extremely tough and durable carbide composition forms the foundation for the extended tool life and performance of the Mirage, it's the variable flute design and the centre cutting geometry that delivers the astounding material removal characteristics and the flexibility to conduct a multitude of processes.

The four flute X-Red coated end mills are available with a 3, 4, 5 and 6 mm diameter, each consisting of a 6 mm diameter H6 ground shank for enhanced strength, rigidity and performance. These smaller diameter tools have an overall length of 58 mm with a 10 to 13 mm flute length with the option of a square end or corner radius of 0.25, 0.5, 0.75, 1 mm and 1.5 mm depending upon the chosen tool and diameter.

The 8, 10, 12, 16 and 20 mm diameter variants are available with flute lengths from 18 to 38 mm with an overall length from 64 to 104 mm depending upon chosen diameter. The larger and more robust end mills in the Mirage series retain an identical shank and flute diameters. This enhances rigidity that supports high material removal rates whilst reducing vibration and improving surface finishes.

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ITC launches super-slim milling chuck

Now available from Industrial Tooling Corporation (ITC) is the new HMC12J, a super-slim design milling chuck with peripheral coolant supply from BIG KAISER. As a leading company in premium high-precision tooling systems and solutions, customers can be confident that the new HMC12J from BIG KAISER will provide optimal machining performance for both heavy and finish end milling tasks.

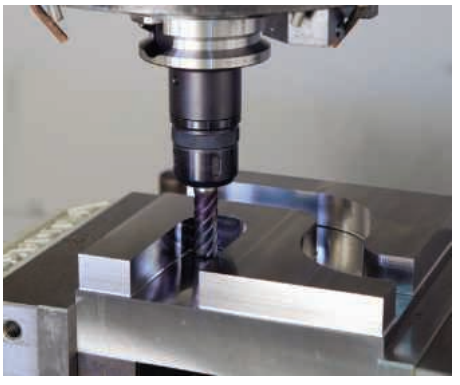
Delivering high power and precision, BIG KAISER's new Hi-Power Milling Chucks (HMC) achieve powerful clamping and high rigidity for heavy cutting applications. The unique slit design means that the new HMC12J applies the highest gripping force to the cutting tool of any comparable chuck in its class. Due to the inherently stronger construction of milling chucks, the clamping force of these chucks is five to six times greater than standard collet chucks.

The chuck design integrates fine slots and hundreds of needle bearings to ensure precision high-power clamping performance. Despite being designed for heavy cutting, this HMC milling chuck maintains an accuracy of ten microns at a 4xD runout. This remarkable attribute gives the HMC12J the additional flexibility to be used on finishing applications.

The slim yet rigid design of this new chuck brings the external diameter down to an impressive 32 mm, the smallest in its class. This was achieved whilst maintaining an uncompromisingly substantial section of 10 mm to prevent chatter and deliver cutting security. The maximum jet-through coolant pressure is 70 bar.

The chuck can be used on machining centres with conventional spindles, making it easy to add to existing tools. In a test, the new HMC12J was compared to a collet chuck. Operating on a DMG MORI NVX 5080 milling machine with a BIG-PLUS BBT40 spindle system, the trial milled C50 steel with a 12 mm diameter cutting tool. Conditions were set at V=80m, feed per tooth (fz)=0.092, width of cut (ae)=3.5 mm. From this, the depth of cut (ap) was increased until vibration was evident. The result was that the HMC12J could cut to a depth of 22 mm before vibration was experienced, which was double the 11 mm cutting depth achieved with the collet chuck.

As a specialist tooling supplier, ITC's objective is to supply customers with the best possible products, at the same time making them more efficient by introducing productivity and method improvements. To achieve this, it continues to invest in a team of capable and enthusiastic engineers and technical sales people, backed up by an in-house team. From solid carbide and PCD tooling, through to indexable milling, turning and boring, plus top-quality tool holders, ITC has an unbeatable product range.



ITC's state-of-the-art production facility includes CNC grinding machines from world leading manufacturers including Walter, Deckel, Rollomatic and Anca. It has invested in a centralised oil filtration system to ensure that grinding takes place under optimum conditions with clean oil, and its inspection department includes computerised laser measuring equipment, to maintain the high standards for which ITC is renowned.

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Floyd gets into gear with new HOBit hobbing line

Floyd Automatic Tooling has now launched a new program of gear cutting tools from Hommel & Keller. Introduced under the HOBit brand, the new range incorporates a complete series of disc cutters, bore and shank type hobbing tools as well as shaper and power skiving cutters that can all be manufactured to customer specifications.

The new brand has been developed by the gear cutting experts at Hommel & Keller to cater for the rising demands of hobbing tools from end users familiar with the quality, precision and capability of the company's specialist knurling tools and wheels that are well known as the Zeus brand. Globally renowned as the industry benchmark in knurling products, Hommel & Keller has now developed its own hardening technology and PVD coating division, which makes the new HOBit line so formidable.

The innovative new HOBit gear cutting and hobbing tools are manufactured to customer demands with HSS, PM and solid carbide tools offered. Furthermore, the new HOBit series is available with a variety of coating technologies that include TiN, TiCN, TiAlN, nACo. nACo3 and nACRo with a host of alternate coatings available upon demand. This wealth of selection ensures that the new HOBit product lines can deliver optimum performance levels, astounding tool life and productivity that will surpass all other products, regardless of your process.

The vast array of standard and specialised HOBit products can be suited to customer demands with geometries and tooth angles and the subsequent tooth numbers machined with absolute precision. This unprecedented level of precision extends to all facets of every product in the HOBit line up.

If you're not sure of the process performance benefits you can obtain from the HOBit Series, get in contact with the cutting tool experts at Floyd Automatic Tooling. The expertise of the Baldock based cutting tool specialists will guide manufacturers through the efficiency, productivity and cost saving benefits of the HOBit range. Furthermore, as industry experts Floyd Automatic will provide a long-term service package that incorporates everything from design and manufacture through to regrinding.

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High-speed, high-efficiency hole drilling at reduced cost

Kyocera Corporation has announced that it has developed a new line of indexable modular drills, Magic Drill DRV, to be used mainly for hole drilling in the machine tool business. Ideally suited for the automobile, aviation and medical device industries, the new indexable drills combine a chemical vapor deposition (CVD) coated insert on the outer edge and a physical vapour deposition (PVD) coated insert on the inner edge for the first time, enabling high-speed and high-efficiency processing.

The uniquely developed chipbreakers have improved chip evacuation and the holder's thicker center core provides enhanced rigidity. Consequently, the new drill is now capable of deep drilling up to 6xD, six times the holder diameter, for the first time. Kyocera aims to contribute to its customers' increased productivity by broadening its product lineup to meet more diversified needs.

Reduced weight and greater functionality of components are currently being promoted in the automobile, aviation and medical device industries. This trend

increases the demand for products that enable high-speed and high-efficiency drilling of various workpiece materials under diversified drilling conditions. With previous indexable drills, PVD-coated inserts were adopted for both the outer and inner edges, which has the disadvantage of increased wear and tear on the outer edge because it comes into contact with the workpiece material at a higher speed. To solve the problem, this new model adopts a CVD-coated insert with heat and wear resistance for the outer edge and a PVD-coated insert for the inner edge so that stable processing can be achieved even if a strong force is applied to the inner edge. In this manner, by making use of the features of both CVD and PVD coatings, high-speed and high-efficiency processing become feasible.

With an optimum chipbreaker selected from the four types available, the Magic Drill DRV series is capable of working with a variety of workpiece materials. The chipbreakers are designed so that four corners (edges) can be used, thereby reducing the customer's processing costs.

Unique cutting edge enables excellent evacuation of drilled chips even in deep drilling, 33 percent increase of holder centre core and drilling hole up to 6xD.

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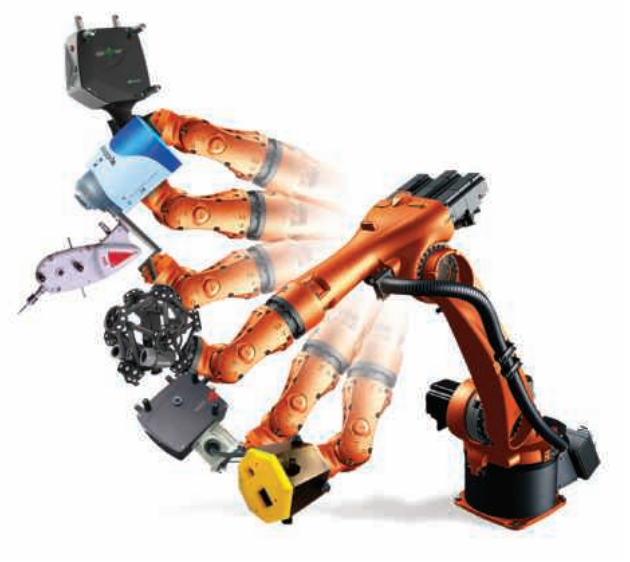
EMO 2017: Hall 5, Stand E44

Selecting the right software for your CMM



Coordinate Measuring Machines(CMMs) are vital measurement systems for many quality departments and are a common site in manufacturing companies where product dimensional quality is important. In its simplest form, all CMMs are the same, typically being made up from three axes with scales and motors, a measuring probe on an indexing probe head, a CNC control system and measuring software. Of these many active components, the software used to control and record the measurement of parts is vital to ensuring that you get the most complete performance out of your machine, and it can be the difference between efficient or inefficient measurement. Therefore, it is important to be diligent when exploring CMM software to find the package that will best fit your needs. How can you ensure that when selecting a CMM software you have chosen the best option?

The 70/30 rule

The key to this choice is to understand the 70/30 rule of CMM software selection. This principal is based on the fact that in general all CMM software will meet similar functions for 70 percent of what you need. Most CMM software should provide for basic tasks such as measurement routines, probe calibration, basic alignments like "plane-line-point", and data reporting, among other features. The trick is to find the CMM software that goes beyond the 70 percent in basic performance to deliver the 30 percent of extra functionality that provides the best added value for your current and future requirements.

How to determine the 30 percent difference

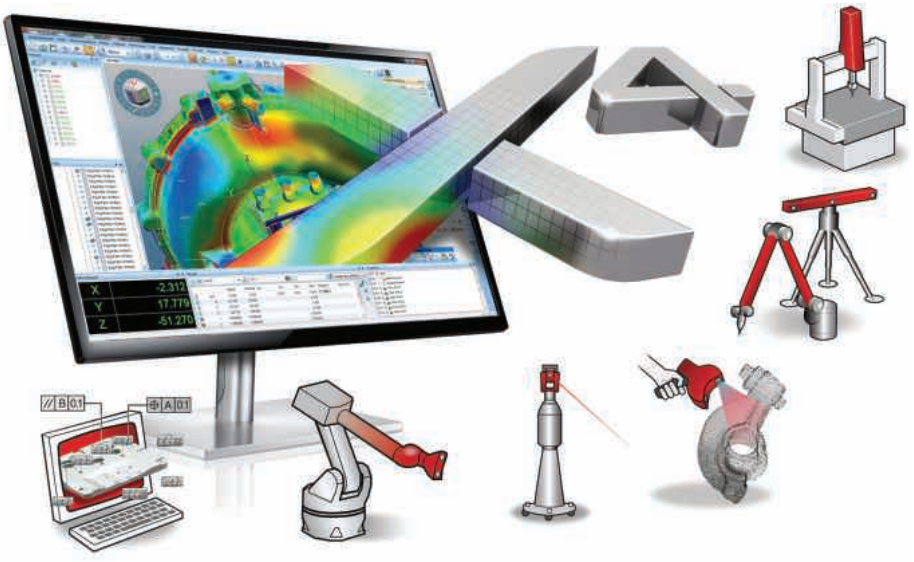
If we consider this 70/30 rule of selecting CMM software, we now have a question. How do you determine what can account for the 30 percent difference in added value? Let's take a look at the main factors to consider when determining the added value that will make certain software packages stand out in comparison to others.

Programming

Programming CMM software all comes back to ease of repeatability; you create programs to record your measurement routines and save time and energy upon repetition.

When looking at available programming options there are a couple of important factors. One such factor is the wide diversity of the programming languages, which can be likened to modern-day programming in a wide variety of applications. In order to quickly build robust and functional applications, modern-day software programmers use visual programming tools to get the most out of modern day operating systems and hardware capabilities. The days of typing in text or language based coding are gone. The same goes for CMM programming.

For many experienced CMM users, support for the Dimensional Measuring Interface Standard (DMIS) provides powerful programming using the same standardised language they have been using for decades. However, this demands extensive use and experience to fully implement the programming code required in modern day measuring tasks, and due to the longevity of DMIS and the fact it has to cater for older generation measuring systems, it often impedes the user in getting results quickly. In particular, new users struggle with language syntax and the multiple options and sub-options that DMIS insists on the user getting right.



Alignment variety

Part alignments are a necessary component of any modern measurement software and are of special importance if you plan on

using CNC movements to measure your part. Getting the alignment right first time is essential to ensuring repeatable and correct measurement results, and while most CMM software can handle simple alignments, not all part geometries are easily accommodated.

Look for CMM software that allows for a wider variety of user-friendly alignment methods when working to align even the most complex part geometries. One thing to consider is if the software has a capable surface engine to allow for alignments based upon surface features of the CAD model. This allows for many more alignment strategies than is provided by language based programming software. If you choose CMM software with a variety of alignment options, you can quickly and easily align even the most complex parts in just a few clicks.

Remember, aligning your part is the most important task that must be done before automatic measurement occurs, as all measurements are relative to that aligned system, and any errors created at that stage are transferred into the measurements results. It will always be in your interest to choose the software that provides the best variety of alignment choices.

Device compatibility

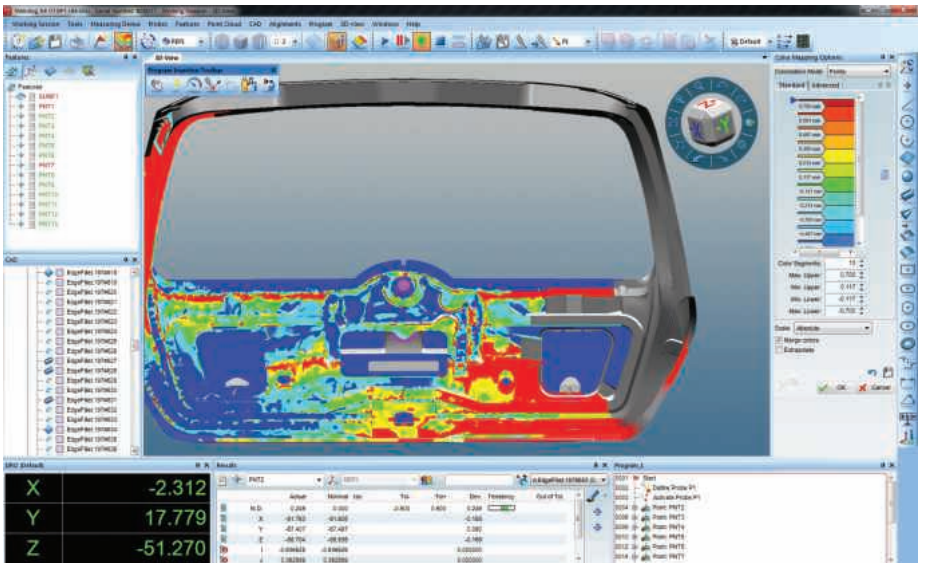
While today CMMs remain the backbone of many quality departments, advancements in technology have made devices such as portable optical devices, articulating arms, laser trackers, laser radars and robots increasingly prevalent.

Choosing CMM software that provides full compatibility with a wide array of metrology devices can have a number of benefits for your company. First, if you currently have one of these other devices or have potential to purchase one in the future, this can prepare you to better work across devices. Instead of having to deal with a different software for each device used, you can utilise a single software with standardised behaviour.

Reporting

The end goal of any part inspection is to generate a clean, clear report of the results to accurately present any data gathered. The time required to generate this report is directly proportional to the reporting capability of the software.

Look for software that enables any user to easily create inspection reports in a matter of minutes. If a software selection does not



do that, and takes as much time to create a report as it does to actually inspect a part, then valuable production time is wasted as your CMM stands idle while the inspector churns out reports.

Customisation

When choosing CMM software, how important is customisation? It may seem like a superficial aspect of any software, but it can be the secret to providing added value for you.

It is important to remember that software customisation is not just a matter of having a flashy interface. Rather, it is a function of enabling you to tailor the software to your own personal needs to increase efficiency and usability, rather than just the needs of the software designer. Every user will use the software in a slightly different manner and therefore it is important that your software choice be customisable to your individual needs. In this respect look for software that allows you to easily customise both the appearance and function of what is on screen, so you can have the important tools you need close by.

Performance

Modern computing has come a long way in terms of processing and performance power, but does your software fully utilise these capabilities?

Consider CMM software that allows for raw data storage through unlimited memory usage and multiprocessor platforms through 64-bit based architectures. In choosing software with these capabilities, you will attain maximum performance when working with large CAD files or point clouds. This can be the deciding difference in allowing software to capably handle more difficult calculations such as point projection, tolerance evaluations, and point cloud filtering and fitting.

Choose the CMM software with the 30 percent difference

The 70/30 rule of CMM software selection should be a key factor when making the choice that will bring the best value to your system.

While generally 70 percent of all CMM software will be the same, it's the 30 percent difference that provides the real value in performance and use. Once you understand the 70/30 rule, the only challenge is discovering the software that meets the 30 percent difference in added value. Consider the factors that would determine the 30 percent value for your needs before making your choice.

For a long-term solution that embodies the suggested qualities, serious users of CMM's will choose software from companies such as Metrologic Group and Measurement Solutions, with a powerful yet user-friendly software suite that can be optimally tailored to all your measurement needs, and worldwide product support to ensure that you are always in good hands. With the critical role that CMM's continue to play in the industry and the ever-increasing demand to boost production efficiency, having the right CMM software can be a vital factor in driving the success of your company today, tomorrow and for years to come.

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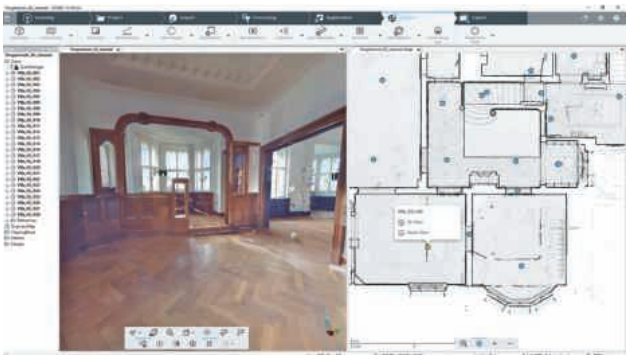
FARO introduces SCENE 7.0 with real time, on-site registration

Seamless Integration of FARO FocusS Series 3D Point Clouds



FARO, the world trusted source for 3D measurement and imaging solutions for factory metrology, construction BIM/CIM, product design, public safety forensics and 3D solutions, has announced the availability of the FARO SCENE 7.0 software platform. SCENE 7.0 includes the high quality, high value functionality offered by its predecessor, SCENE 6.2, such as automatic object recognition, scan registration and position, and takes it a step further with integrated real time on-site registration simulation for FARO FocusS Series Scanner 3D point clouds.

The unique value of SCENE 7.0 can be realised by diverse industries, including architecture, engineering, construction and public safety or any industry where there is a premium placed on capturing/scanning, analysing and enhancing 3D data.

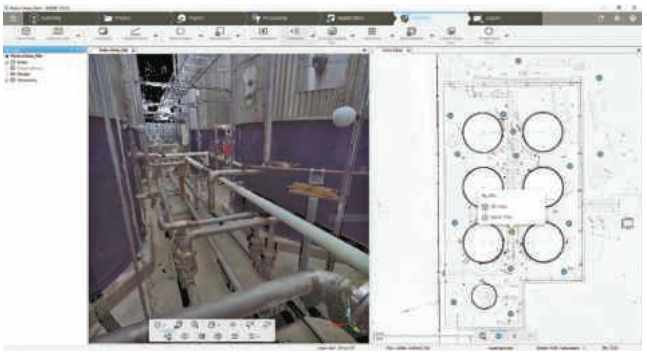
Previously, the process of taking an actual scan in the field, transferring that scan to a computer workstation/PC to start using the data was a three-step process. The project 3D scan data was stored on physical SD cards at the project site. Then the user would bring the SD card to the office and physically insert the SD card into a workstation/PC for download. Finally, the scans, once all loaded from the SD cards, would be registered (i.e., logically integrated into a cohesive set of data points on the computer workstation/PC in the office and then the data would finally be ready for use).

SCENE 7.0 supports a seamless, more efficient process. Real time, on-site registration enables the 3D scan data, whether it be from a single scan or multiple scans in process simultaneously, to be wirelessly transmitted, with no SD cards needed, directly to an onsite computer workstation/PC in real time. Additionally, the scans are automatically aligned on the workstation/PC computer in real time, in the field. This enables a new set of powerful user benefits unrivalled in the industry.

In-office data processing has been dramatically reduced and, in some cases, eliminated altogether. Users come back to the office with a registered product and can get to work immediately. Additionally, the larger the project or the more scans required, the greater the realised efficiencies, in terms of project cycle time and human resources on site.

FocusS Series Scanner users are now able to preview scans/projects while still in the field, confirm that all of their project requirements have been accounted for while still in the field and make any necessary adjustments in the field in real time.

"SCENE 7.0 is unquestionably the most advanced software platform of its kind. It significantly elevates the productivity of the FocusS Series Laser Scanner user well beyond what is available for any hardware and software solution package for cost efficient 3D data capture, processing and analysis, "states Joseph Arezone, chief commercial officer. "Real time, on-site registration is a major milestone but just one of the efficiency enhancing features, including "smart" filtering that removes valuable hours from point cloud clean up and drives significant reductions in post processing time."



SCENE 7.0 is now available for ordering.

FARO develops and markets computer-aided measurement and imaging devices and software. Technology from FARO permits high-precision 3D measurement, imaging and comparison of parts and complex structures within production and quality assurance processes. The devices are used for inspecting components and assemblies, rapid prototyping, documenting large volume spaces or structures in 3D, surveying and construction, as well as for investigation and reconstruction of accident sites or crime scenes.

FARO's global headquarters are located in Lake Mary, Florida. The company also has a technology centre and manufacturing facility consisting of approximately 90,400 square feet located in Exton, Pennsylvania containing research and development, manufacturing and service operations of the FARO Laser TrackerTM and FARO Cobalt Array 3D Imager product lines. The Company's European regional headquarters is located in Stuttgart, Germany and its Asia Pacific regional headquarters is located in Singapore. FARO has other offices in the United States, Canada, Mexico, Brazil, Germany, the United Kingdom, France, Spain, Italy, Poland, Turkey, the Netherlands, Switzerland, India, China, Malaysia, Thailand, South Korea, Australia and Japan.

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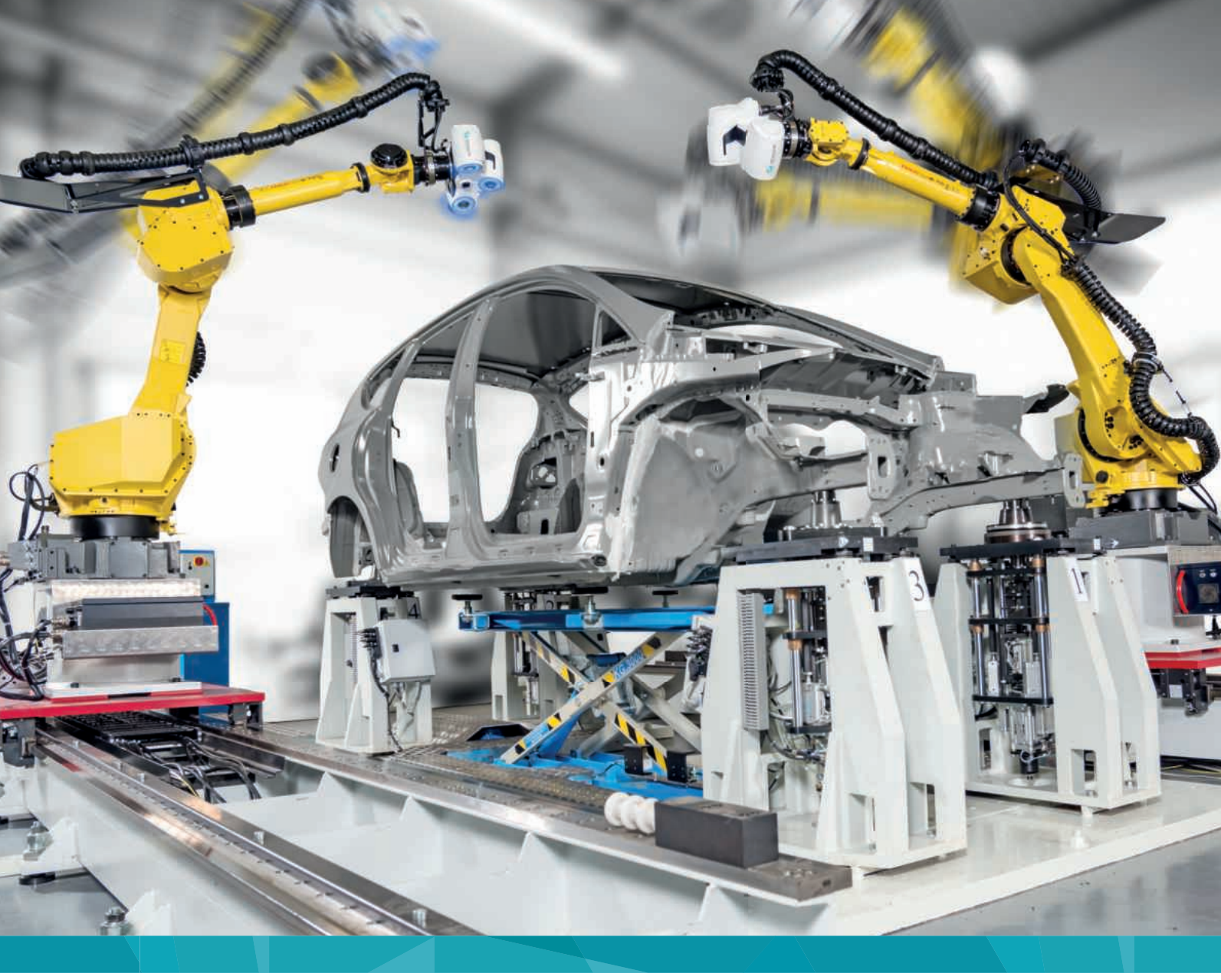

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Hexagon Manufacturing Intelligence introduces Optical Scanning System for the aerospace sector

Hexagon Manufacturing Intelligence has launched GLOBAL Advantage HTA (High Throughput and Accuracy), an enhanced metrology solution for the aerospace industry.

Increased production demand for higher performance aircraft engines spurred the design of the new GLOBAL Advantage HTA measurement solution for compressor blades. The technology-driven, high-accuracy measurement system is tailored to provide a step-change improvement in measurement throughput, while delivering high-density measurement data for enhanced aerofoil geometry analysis.

The GLOBAL Advantage HTA Platform is based on Hexagon's advanced HP-O Multi optical scanning probe technology for high-speed non-contact measurement of aero and land-based compressor blades in shop-floor environments. Utilising frequency-modulated laser interferometry technology, GLOBAL Advantage HTA provides rapid non-contact scanning at single-micron uncertainty to verify blade characteristics including aerofoil, platform, root, shroud and other features.

Highly-polished blade surfaces are easily measured, without the need for the secondary coating and cleaning operations required for many non-contact technologies. Using BladeSmart inspection software from Hexagon, the GLOBAL Advantage HTA solution includes an execution command library containing aerofoil, platform and root geometry methods, allowing users to create and deploy measurement programs faster.

Michael Mariani, director of strategic business development for Hexagon Manufacturing Intelligence North America, says: "The rigorous demands of increased engine production and the growing trend for shop-floor inspection paved the way for the GLOBAL Advantage HTA, the first comprehensive solution specific to blade inspection. The GLOBAL Advantage HTA technology integrates seamlessly into the manufacturing engineering and production operations of aeroengine manufacturers. More importantly, this high-precision metrology solution meets the throughput and flexibility requirements of today's aerospace industry."

The GLOBAL Advantage HTA is available to order worldwide now; more information is available from local Hexagon commercial operations and dealers.

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, its expertise in sensing, thinking and acting, the collection, analysis and active use of measurement data, gives its 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, the company is shaping smart change in manufacturing to build a world where quality drives productivity.

Hexagon Manufacturing Intelligence believes the key to success for its customers is the ability to work at the speed they need while maintaining complete confidence in the reliability of the process and the quality of the products. And this is what Hexagon promises to its customers: speed and confidence in manufacturing transformation.

The aim of Hexagon Manufacturing Intelligence is to combine technologies and ideas to enable this closed loop manufacturing, developing solutions that solve customer problems. In cognitive science, the human response to a problem can be described in three terms: sensing, thinking and acting. These are the terms that the company uses to define its areas of expertise.

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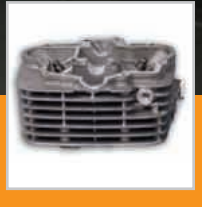
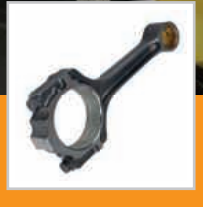

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Aberlink CMM improves Pact's pace and precision

Founded in 1980 as a specialist grinding company, through customer demand over the past 37 years, Luton, Bedfordshire based Pact Engineering Ltd has continually grown its list of competencies. Although grinding remains a key strength, the company can now truly be described as a one-stop-shop for expert subcontract engineering services. In addition to other first-class machining facilities, Pact offers CNC turning, CNC milling, wire erosion and CNC universal grinding, all supported by an expert inspection provision.

Pact is able to deliver projects from the development and manufacture of one-off specialist parts, to the completion of long production runs to exacting standards. The company's reputation for the machining of complex components has resulted in a customer base that includes technically challenging sectors such as the aerospace, automotive, Formula 1, oil and gas, pharmaceutical and the medical industry.

The nature of the demanding businesses served by Pact means that a strong quality ethos permeates all of Pact's activities.

The mainstay of Pact's inspection provision is an Aberlink Axiom Too CNC Coordinate Measuring Machine (CMM) that was purchased two years ago. In addition to being used by the company's inspection department, the ease of use of the Aberlink CMM means that Pact's machine operators have access to the Aberlink CMM. Production personnel are able to instantly recall the appropriate, pre-written program and to measure first-offs before beginning a production run, machine operators also make regular in-process checks on the Axiom Too when performing long production runs.

Despite the impressive measuring speed of the Axiom Too, as a result of ever rising levels of production, the increased demands placed on the company's CMM meant that delays were recently beginning to occur. For instance, occasionally, when it was needed to verify the adherence to specification of a first-off component, the Aberlink machine would be engaged in a lengthy, CNC final inspection routine on a large batch of complex components The delays incurred by machine operators whilst waiting for the CMM to complete its tasks, meant that valuable production time was lost.

The accuracy and ease-of-use of Pact's Aberlink Axiom Too CMM meant that the company again turned to Aberlink for a solution to its mounting inspection capacity problems. The answer was found in the recently launched Aberlink Xtreme CMM.

Steve Banfield, Pact Engineering Ltd director explains: "Our Aberlink Axiom Too has been a great success, its precision specification has enabled it to inspect even our most accurate and complex parts.

The Aberlink Xtreme CNC CMM is designed with a novel non-Cartesian structure and uses linear motors and mechanical bearings. This advantageous arrangement ensures that the new Aberlink machine maintains its impressive accuracy at very fast measurement rates and does not suffer from the accumulative inaccuracies that occur in conventional 3-axis Cartesian arrangements. As its name implies, the new Xtreme CNC CMM offers customers a robust solution for undertaking precise inspection routines wherever they are required.

The Xtreme utilises Aberlink's renowned 3D CNC software, ensuring greater user productivity and profitability. A welcome

bi-product of any Aberlink CMM inspection routine is that a simultaneous picture of the measured component is created on the computer screen. Dimensions between the measured features, mirroring those that appear on the component drawing, can then be simply picked off as required. In essence, this 'smart' software represents an intelligent measuring system that is able to automatically recognise and define the various features being measured. Aberlink 3D is claimed to be the easiest to use and most intuitive CMM software currently available.

The great early success of Aberlink's recently launched Xtreme CNC Coordinate Measuring Machine has triggered high levels of demand for practical demonstration. To enable potential UK Xtreme customers, who are unable to visit Aberlink's HQ or its regional demonstration facilities, to witness the cost-effective machine in action, the company has manufactured several smaller, portable versions. Aberlink Sales Representatives are now able to carry the quarter-sized technology demonstrators in their cars, visit potential customers' premises and prove the outstanding capability and speed of the Xtreme CNC CMM.

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New hand-held laser scanner

Incorporating blue laser technology, an ultra-fast frame rate, specially developed optics and the ability to measure the most challenging materials, ModelMaker H120 is the next generation of portable laser scanner from Nikon Metrology. It efficiently delivers detailed, accurate data either in the metrology lab or on the shop floor in a fraction of the time of competing technologies and offers high productivity for challenging applications.

Having a field-of-view width up to 120 mm and a point resolution down to 35 µm, the system is ideal for users requiring fast, detailed data collection over a large area. A frame rate of over 450 Hz is available even when measuring difficult surfaces such as carbon fibre and gloss black as well as reflective or multi-coloured parts.

With 2,000 points per scan line and no reliance on point-to-point interpolation to artificially boost data density, it is possible to measure very small details on large surfaces even when cycle time is critical. So whatever the application, users can be confident that the productivity and clarity of the data remains at the highest level.

ModelMaker H120 uses advanced Nikon optics and a blue, low speckle laser to generate high accuracy, low noise data, making it possible to clearly identify small scratches and abrasions on a surface. In addition to rapid collection of surface data, sharp edges are represented with clarity

thanks to a scanner accuracy of 7 µm (1 sigma) and a combined system accuracy with Nikon Metrology's MCAx articulated arms of up to 28 µm (2 sigma).

The fourth generation of the company's Enhanced Sensor Performance (ESP4) dynamically adapts the laser source intensity not just for every scan line, but for every point in each scan line, enabling parts with significant colour changes or reflectivity to be measured from any angle. This minimises the need for training, as a single scanner setting is capable of measuring almost all parts encountered in industrial metrology applications.

Thermal stability and temperature compensation eliminate the need for a warm-up period. The user simply connects the unit to a PC using a USB cable, powers on and starts scanning within a few seconds. Real-time feedback is provided by display of the boundaries of the measurement area, ensuring that scanning is always from the optimal position. An integrated locking mechanism provides a simple, user-friendly and repeatable connection to MCAx arms of different sizes and specifications throughout a facility, so there is no need to move the whole arm assembly.

Using the ModelMaker H120 scanner with the high performance MCAx arm, the combination of non-contact scanning and contact probing allows users the freedom to measure almost anything. It includes freeform and geometric parts, hard-to-reach features, highly textured or transparent materials and even those that deform easily, such as foams and textiles. In many cases of industrial feature measurement, the accuracy and low noise level of the new scanner significantly exceeds the performance of tactile probes.

Through direct integration with a variety of class-leading software tools for scanning, probing, processing and dimensional analysis of measurement data, users can tailor the solution to their needs. Applications range from advanced inspection using GD&T (geometric dimensioning and tolerancing) with colour map comparisons to nominal CAD, fly-outs and sectional cut-through, to reverse engineering or even simply using high-definition scan data to generate polygon meshes for additive manufacturing.

With the acquisition of Metris in 2009, Nikon enlarged its portfolio with optical 3D measuring instruments. The new division "Nikon Metrology" today offers the broadest range of metrology solutions for applications ranging from miniature electronics to the largest aircrafts. Nikon Metrology's innovative measuring and precision instruments contribute to a high-performance design-through-manufacturing process that allows manufacturers to deliver premium quality products in a shorter time.

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EMO 2017: Hall 6, Stand D46

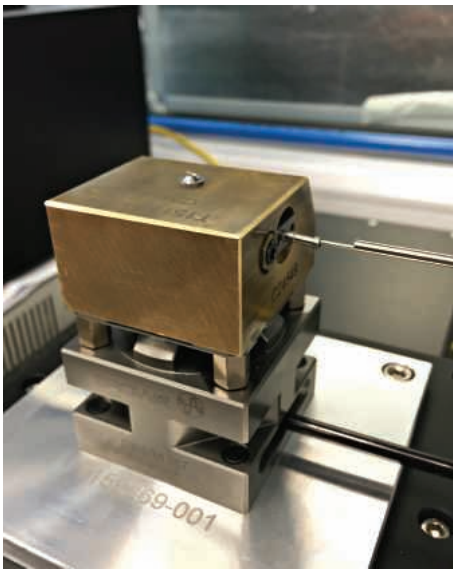
ACCRETECH Surfcom Roughness and Contour Detector

Metrology expert Bowers Group has supplied Moog Controls Ltd with an ACCRETECH Surfcom Roughness and Contour Detector to measure critical components involved in the manufacture of servovalves.

Based in Tewkesbury, Gloucestershire, Moog Controls Ltd manufactures Moog Servovalves for all industrial applications, including the aerospace industry. Servovalves are electrohydraulic, continuously acting valves that transform a changing analog or digital input signal into a stepless hydraulic output, flow or pressure.

Used in aircraft fuel control systems, motion control systems, and landing gear systems, the critical components manufactured by Moog Controls Ltd have tight tolerances and require the highest level of accuracy and quality. The surface finish of the component is imperative to the quality of the finished part, as surface imperfections typically lead to stress on the component. The accurate measurement of the surface finish is, therefore, very important.

In order to measure critical components involved in the manufacture of servovalves, Moog Controls Ltd has been using a 20-year-old Taylor Hobson Talysurf. Unfortunately, there were some problems occurring when the Talysurf was being used to measure surface finish of the component. Due to the small size of the parts, and the manual intervention required during the measurement process, the probes would regularly break. Replacing them was costing Moog approximately £12,000 per year.



Moog Controls Ltd were, therefore, looking for options to improve on this technology, and were keen to find a new measurement solution for the measurement of the radius of the flange and head part of the component, as well as the surface finish.

Moog Controls Ltd contacted Bowers Group, which supplied the company with an ACCRETECH Surfcom 2000SD3-13-N Roughness and Contour Detector. The large measurement area and hybrid detector enables the accurate capture of contours and surface roughness in a single measurement. Measurements can be performed quickly, simply and accurately, without having to keep changing probes, making the Surfcom highly efficient in this application.

The Surfcom also has the advantage of being fully automatic and hands free; the CNC programme facilitates the measurement process and minimises operator intervention, reducing the capacity for errors.

In addition, Bowers Group supplied Moog Controls Ltd with a number of bespoke probes that were specially manufactured by Bowers to meet their needs. Specially manufactured fixtures are used for each component, ensuring the accurate and repeatable profile measurement of each component.

Moog Controls Ltd typically manufactures the components in batches of 600/700, with first offs and one component per shift measured to ensure quality. The Surfcom takes around 10 minutes to run each CNC programme, which is a similar length of time to the old method carried out by the Talysurf. However, the Surfcom can record multiple measurements in one run, making it much faster and significantly more cost effective, especially when the cost of probe breakages is considered. The Surfcom also enables Moog Controls Ltd to print out results in one collaborated document, which is a great visual aid for determining whether measurements are within tolerance.

Gurpreet Singh Gill, CMM roaming inspector at Moog Controls Ltd, says: "The Surfcom certainly meets our needs here at Moog. We are very pleased with the accuracy the machine provides, and the programme software works very well.

''We considered various metrology companies to meet our measurement requirements, but we chose Bowers Group for its excellent customer service and our previous good relationship with the Bowers sales team. If we have any questions, or we need any further help, we are confident that Chris or Ryan at Bowers Group will be more than equipped to help us.

The Surfcom will soon have paid for itself when the cost of broken probes caused by the Talysurf is taken into account, saving us over £12,000 per year."

With a long history in the design and manufacture of aerospace servovalves, Moog Controls Ltd is a leading company in servovalve technology for all aerospace applications that require precision motion control. The company manufactures electrically operated servovalves that control the flow of hydraulic fluid to actuators on launch vehicles. Servovalves provide precise control of position, velocity, pressure and force with post movement damping characteristics.

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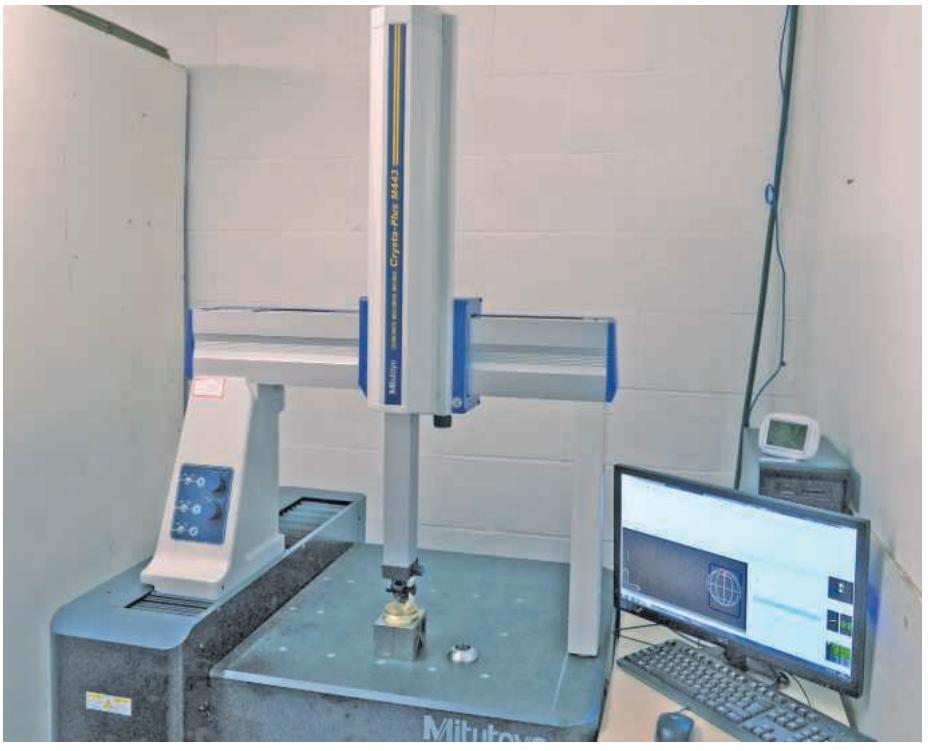
EMO 2017: Hall 6, Stand D62

Mitutoyo delivers precision for seal manufacturer



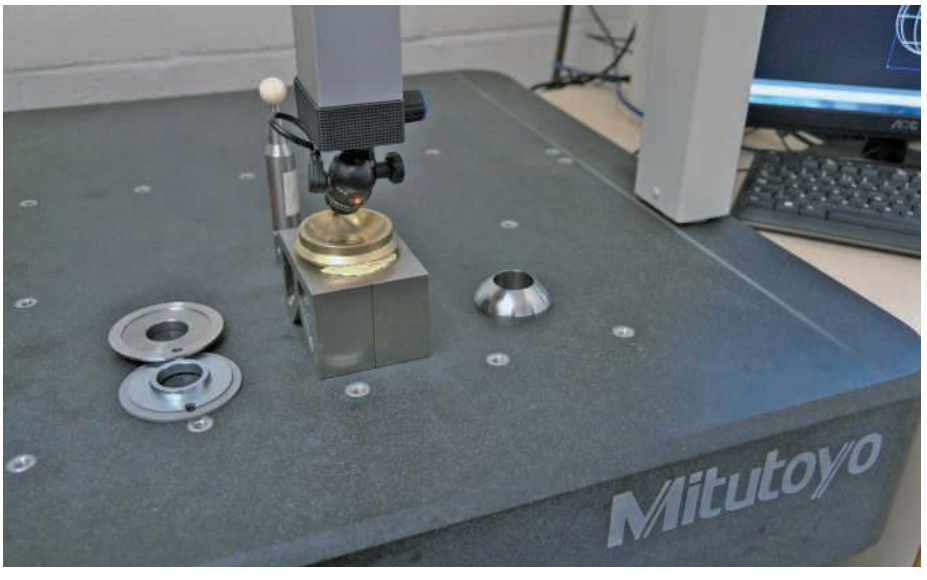
When CDK Seals won an order for the production of metal components from a new aerospace customer, the leading manufacturer of seals for the food, pharmaceutical and petrochemical sectors had to employ new production equipment and methods. Historically, the Yeovil manufacturer has produced its seals on specialist machines from a variety of PTFE composites, however the new £100,000+ order required a three part assembly with steel, ally-bronze and PTFE.

With a Doosan Lynx 220 Y-axis turning centre delivered in time for the contract to commence in April 2016, the manufacturer of piston, rod, rotary and static seals needed additional support with respect to producing and measuring the new assembly. It is here where Mitutoyo stepped into the equation.

Dave Paget, managing director of CDK Seals, says: "Coincidentally we ordered the Doosan before we won the order, so when the machine was delivered we needed to work out how to machine the parts and also measure the components that complete the aerospace assembly. When it came to measuring the parts, we called Mitutoyo and their engineer interrogated the part drawings and delivered a solution. It was an extremely straightforward process that was tailored to our exact demands."

With 90 percent of the company's seals manufactured on specialist Sealjet machinery, the machining of metal components brought a change of processes for the ISO: 9001 certified manufacturer. New to machining metallic components for customers, CDK employed Arno Cutting Tools to provide a complete tooling solution for the project whilst Trevor Stubbs from Mitutoyo conducted a complete investigation from a metrology perspective.

The three component assembly consists of both a concave and convex component as well as a housing that makes the complete assembly 80 mm diameter with a 60 mm height. Recalling the process of specifying Mitutoyo, Dave Paget says: "We initially looked at local metrology companies but Mitutoyo proved the most professional, comprehensive and even cost-effective solution. We already had a range of micrometers and vernier callipers from Mitutoyo and the name is synonymous with precision and quality. This was proven by the enquiry through to installation service from Trevor Stubbs."

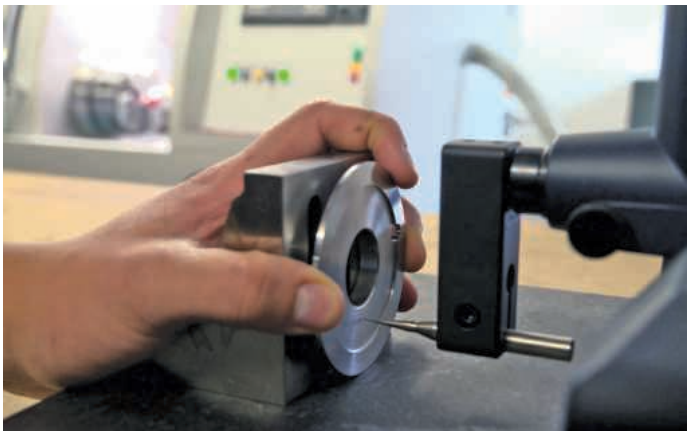


The issue for CDK was that the 1,500 assemblies with a total of 4,500 parts had to be machined to a 0.03 mm tolerance. Unfortunately for CDK, its micrometers and vernier callipers couldn't measure many of the complex features, especially the curved surfaces. This situation was particularly pertinent for a 4 mm diameter cross drilled hole that is positioned on one of the concave surfaces. Mitutoyo invited CDK engineers to its UK headquarters in Andover to investigate the suitable options and it was agreed that the Crysta Plus M443 Coordinate Measuring Machine (CMM) was the ideal solution.

The cost-effective and user friendly CMM with a bridge type design has a work area of 400 by 400 by 300 mm with an astounding resolution of 0.0005 mm. Utilising high precision linear scales and air bearings on all axes, the Crysta Plus M443 generates unparalleled precision for workshops working in average ambient temperatures from 15 to 30°C.

Dave Paget says: "We agreed with Mitutoyo that the Crysta Plus was the most

suitable product for measuring the highly critical parts and ordered the machine on a Thursday. It was delivered and commissioned the following Wednesday. Mitutoyo were excellent. They installed the machine and did the programming for the three seal components, so we could be instantly up and running. The training was simple and straightforward and we have the CMM networked to a PC, so we can store any subsequent programs off-line. Mitutoyo also provided a series of 3, 2 and 1 mm diameter ruby probes. The small probes enable us to get inside the 4 mm diameter drilled hole and check the concentricity as well as the angle of the hole that has a critical angle tolerance of +/-0.1 degrees."



Whilst the CMM proved ideal for measuring the curved surfaces, internal holes and other critical features, it was agreed that a plate with a 60 mm internal bore, with a bellow moulded to it, should be measured with a digital height gauge. Again, Mitutoyo had the solution with its high performance 2D linear LH600E digital height gauge. Capable of measuring components up to 600 mm high with an achieved accuracy of (1.1+0.6L/600) microns, the easy to use LH600E incorporates a colour TFT LCD monitor, 2GB of USB storage and air bearings in the base unit to eliminate friction over the surface plate. The critical bore assembly has a tolerance of 60 mm +0.03 mm. Now, the LH600E provides complete process reliability with its ability to support quality control and statistical processing functions.

The final issue for CDK regarding the project was the surface finish on the ally-bronze parts. The friction between the mating parts would wear the surface of the parts and this had the potential to impact the performance of the assembly. To eliminate this issue, the mating parts required a surface finish better than 0.4Ra. From a production perspective, CDK invested in a vibratory bowl finishing machine from PDJ Vibro to enhance the surface finish of the parts. However, the parts still required measuring to ensure conformity to the required specifications. Once again, Mitutoyo stepped up with its Surftest SJ-210 portable surface roughness testing machine.

Capable of working independently of a mains power supply, the SJ-210 is capable of measuring almost any part of a workpiece regardless of size. With a 2.4 in LCD screen, the SJ-210 is easy-to-use and read.

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EMO 2017 : Hall 6, Stand D11

Renishaw's focuses on integrated measurement at EMO

Renishaw, a world leader in precision engineering technologies, will be exhibiting its extensive range of metrology and additive manufacturing systems on two stands at EMO 2017 in Hannover. Intelligent machining processes are critical to companies that want to exploit the full benefits of Industry 4.0 and throughout its main stand (**Hall 6, B46**) Renishaw will demonstrate the power of integrating its latest measurement technologies within a manufacturing process.

In **Hall 27**, Renishaw will also exhibit in the new Additive Manufacturing Zone, where it will demonstrate software and systems for metal part manufacture on **stand A72**. This includes the latest version of the company's build file preparation software, QuantAM 2017, which has been designed specifically for Renishaw metal additive manufacturing systems; RenAM 500M and AM 400.

Products highlighted in **Hall 6** will include a new contact scanning system for CNC machine tools, new software for the Equator™ flexible gauge which allows users to fully integrate the system with CNC machine tools, new on-machine and mobile apps that simplify the use of machine tool probing, an enhanced non-contact tool setter for machining centres, a new multi-probe optical interface system, a new surface finish probe for co-ordinate measuring machines (CMMs), and new software that enhances the functionality of Renishaw's XM-60 multi-axis calibration system.

Visitors will also see Renishaw's new machining cell concept, which demonstrates how the ability to monitor key process inputs, analyse data and continuously improve manufacturing processes facilitates increased productivity and higher accuracy. Simply measuring the output of a manufacturing process using 'tailgate' inspection is not enough and, more often, too late to control all the variability in a manufacturing process. It is critical that checks and measurements are also made before, during and immediately after machining to control both common-cause and special-cause variation.

"Intelligent process control is a key part of Industry 4.0", says Paul Maxted, Renishaw's director of Industrial Metrology Applications. "We not only provide technologies and applications that deliver some of the benefits of Industry 4.0, data generated by Renishaw devices can also be used in conjunction with other process information from machines, cutting tools and other sensors within high level predictive systems for intelligent process optimisation and control."

UK-based Renishaw is a world 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 ended June 2016 Renishaw recorded sales of £436.6 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 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.

Modular fixturing for your Equator gauging system

Renishaw Equator fixtures offer specifically designed base plates with a 3-point kinematic system for quick loading and unloading on to the machine. The positive engagement of the base plate ensures each fixture is repeatedly located and securely held in place, allowing quick changeover of parts on and off the Equator within seconds.

Using Renishaw Equator fixtures can improve the throughput, reproducibility and accuracy of your inspection process with quick and repeatable fixturing setups that are easy to configure. Base plates are alpha-numerically labelled so set-ups can be documented and repeated quickly and accurately. All components are hand-tightened and require no special tools.

Fixturing components can be easily positioned for minimal contact on and around the part, providing an unobstructed probe path for inspecting every detail on the part.

Base plates are available in M4, M6 or M8 thread sizes and made from cast aluminium coated with Nituff® hard coat anodise to reduce wear and scratching.

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Flexible force measurement

Force measurement is an essential part of product manufacturing across a vast array of industries. However, relying on large and expensive force measurement machines is not always feasible, or even necessary, in all manufacturing applications.

Quality control teams are often reluctant to conduct product inspections on the factory floor. Instead, part examination is usually redirected to the lab, where the inspection can be performed on a dedicated force measurement machine. Traditionally, force measurement devices are larger pieces of machinery that are designed to deliver accurate measurement of products and parts.

Manufacturers in the aerospace industry, for example, often produce large parts that cannot be easily manoeuvred on the factory floor. In these environments, testing is not always viable until the end of a manufacturing process, when the part can be safety moved to the force measurement device. However, waiting until the end of the production process to conduct an inspection can cause problems.

If any problems are identified with part of product, it may be more difficult to locate where in the manufacturing process the problem has occurred, especially if production comprises of several different steps. As an alternative, quality assurance managers should be able to conduct inspections during the entire production process while on the factory floor, using portable force measurement devices.

Unlike traditional force measurement machines, portable force measurement devices are lightweight. Usually, the technology is hand-held and can be operated by one inspector without the need for assistance. Where a stand is required, stands are smaller and a fraction of the weight of fixed force measurement machines.

Using a portable device enables quality control managers across manufacturing, engineering and research and development sectors to perform accurate batch testing while on the move. The inspection of parts, like those in aerospace, is ideal for hand-held force measurement. However, non-repetitive applications, such as reverse engineering, rapid prototyping would also benefit from the technology.

A hand-held device gives production teams more flexibility, knowledge and greater independence. Production will no longer rely on relatively longwinded quality inspection measures, nor will the team have to wait for the quality control department to move and measure larger parts and products. With the possibility of measuring parts whenever they want, at any point in the production process, production teams can perform better quality control themselves and as a result, make fewer mistakes.

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EMO 2017: Hall 15, Stand C08

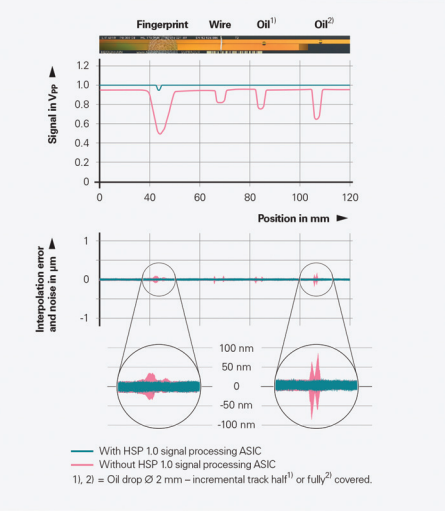
Accurate positional feedback from exposed linear encoders, even when contaminated

Exposed, incremental linear encoders are the feedback system of choice from the axes of CNC equipment for applications where very high positional accuracy is required, for example in semiconductor manufacturing and measurement, printed circuit board assembly machines, metrology equipment and high precision machine tools.

The problem is that the measuring standard (scale) of an exposed encoder is fastened directly to a mounting surface on the machine and can become coated with oil, coolant or dirt, as can the reticle that scans the scale. Signal stability and quality, and hence the integrity of information fed back to the control system, can be adversely affected.

The solution is to use HEIDENHAIN's new application-specific integrated circuit (ASIC), HSP 1.0, which provides a stable measuring signal that is unaffected by even severe levels of contamination. The intelligent circuitry compensates for fluctuations in signal amplitude due to interference, providing a low-noise output that maintains interpolation accuracy of the machine axes.

The signal processing ASIC constantly monitors the scanning signal from a HEIDENHAIN linear encoder. If changes are detected, it compensates for the resultant deviations to establish the original signal quality so that interpolation deviation and position noise do not increase. The signal retains its ideal form and its amplitude stays nearly constant at 1 VPP. Even if the ASIC's control limit were to be exceeded due to increasingly heavy contamination, it would not result in an abrupt failure of the signal, which would instead only slowly decrease in amplitude. If it does, the HSP 1.0 readjusts it by increasing the LED current. The resulting increase in LED light intensity scarcely affects the noise level in the scanning signals, even when there is a high degree of signal stabilisation. This is in contrast to systems where the gain is made in the signal path, which increases the noise level.



Effects of different types of contamination on the signal quality of an exposed linear encoder from HEIDENHAIN, with and without HSP 1.0 signal processing

Detailed accuracy data for better encoder selection

HEIDENHAIN has also introduced enhanced accuracy data for its exposed linear encoders to enable design engineers to refer to more detailed information when selecting the appropriate encoder for an application. More precise prognosis of achievable accuracy is the result.

In many applications, it is not the accuracy over the entire measuring range that is important, but rather the accuracy over a limited section of the scale. On PCB assembly machines, for example, it is the last few millimeters of the measuring path that determines the precision of the mounting process. For such applications, the user obtains substantially more relevant and precise information, enhancing machine performance.

New app for HEIDENHAIN's in-house magazine

Klartext, the in-house magazine published biannually by HEIDENHAIN to present to manufacturers and end users the capabilities of its TNC control systems and probes, is now available as an app for mobile devices. It can be downloaded for Android and Apple devices via their respective online stores.

The app was developed to make the publications more widely available to readers globally and to provide easy, mobile access to industry-leading news and comment on CNC systems and their applications.

Information is available in many languages and both 2016 issues are published in English, German, French, Italian, Spanish and Russian. Readers simply select their preferred language in settings.

Convenient navigation includes full-text search across all issues to find the desired information. As from issue number 64, additional interactive features have been integrated such as videos and picture galleries, as well as a read mode for convenient access on small mobile devices and if required the Klartext app will read the selected article aloud.

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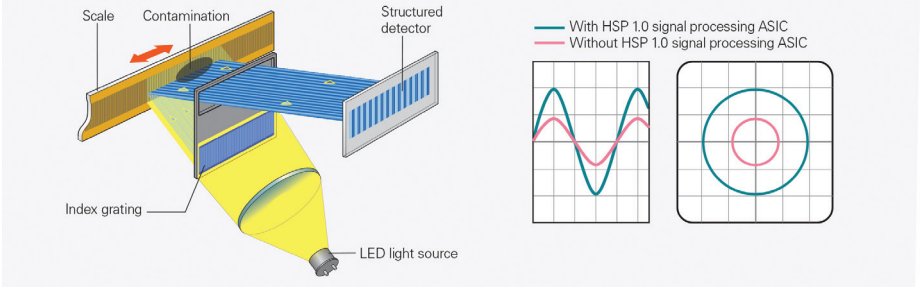
EMO 2017: Hall 24, Stand A01 & Hall 25, Stand B60/D48



With HEIDENHAIN's HSP 1.0 ASIC, contamination on the measuring standard of an exposed linear encoder, or indeed on the scanning reticle, has minimal influence on signal quality

The OmniTest-5.0 universal testing machine

Mecmesin, has launched its new OmniTest-5.0™ universal testing machine. Designed to meet the diverse needs of both R&D laboratories and quality assurance environments, this new generation of universal testing machines offers enhanced performance and capability making it ideal for both product and materials testing applications alike up to a capacity of 5 kN.

The mechanical construction of the frame and drive system offers excellent rigidity with negligible frame deflection. The OmniTest-5.0 frame takes up a relatively small bench space has an integrated cable management system and extended throat depth for testing of samples up to 200 mm in diameter. The OmniTest-5.0 has a simple-to-use front panel for selection of test parameters live load and length readings and precise manual crosshead positioning using the multifunction controller.

Mecmesin's new generation of electronics gives active load control and improved motor performance giving a speed range from 0.01 mm/min to 1,200 mm/min with a positional resolution of 0.001 mm. The

OmniTest-5.0 incorporates state of the art electronics and a new Enhanced Load Sensor (ELS). Load accuracy is 0.5 percent rdg with a resolution of 1:25000 allowing a wider range of tests to be performed without the need to select a different load sensor.

Flexible, reliable, and offering excellent value for money, the OmniTest-5.0 is supplied with Mecmesin's new VectorPro™ MT material analysis software enabling testing to many internationally recognised standards to be carried out. The system can be supplied with or without an extensometer depending on the customer's actual testing requirement.

Powerful, intuitive and touch screen friendly, Vector Pro MT has been designed with ease of use at the forefront through an intuitive drag & drop test builder, icon driven graphing tools and highly configurable reporting options.

VectorPro MT is built around a database that logs user permissions, test parameters, test versions and results. This database architecture provides an audit trail and e-signature functionality delivering compliance with 21 CFR Part 11 requirements.

The OmniTest-5.0 can test a wide range of materials, including metals, polymers, composites, fabrics, glass and ceramics using the extensive selection of grips and fixtures, around which Mecmesin's renowned application solving capability is based.

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How mixed reality can change your vision of 3D measurement

Using the latest X4 kernel developed by Metrologic Group and already integrated with over a hundred 3D measurement devices, it made sense for Metrologic to start providing more collaborative reporting tools to its wide installed base and a technology savvy market. In addition to the very comprehensive reports based on images, tables and fully interactive 3D viewer, allowing fast review of the parts measurements, Metrologic Group wanted to provide an easy-to-use and simple result viewing collaboration tool based on mixed reality. It has seen increasing demands from the market to assist customers in lining up measurement results with real parts. Therefore, it wanted to be the first to deliver this very innovative solution to the market.

Some projector-based reporting systems already allow you to project images of the deviations onto the real part, but it requires either a fixed installation or a complex tracking-based system, with the inconvenience of lengthy setup times.

The advanced HoloLens technology, combined with the renowned expertise and innovative approach of Metrologic, has made possible the integration of mixed reality capabilities to the Metrolog X4 range of software. Metrologic X4 i-Holo allows to blend the measurement results, highlight high deviations and give instructions to the operator using live hologram representations directly over the real part, in front of the operator's eyes; data is sent by Metrolog X4 to the HoloLens in real-time.

Combined with an interactive human interface, supporting gaze tracking, voice activation and self-repositioning, the X4 i-Holo snaps the computed results to the real part. This allows to quickly detect major defects on the part that has just been inspected and immediately plan for a collaborative manufacturing or engineering review of the real part and on location.

Metrologic is now working on further functionalities, to start making 3D measurement immersive in all inspection sequences and phases:

From planning/preparation (merge the inspection plan and the real art/tools to validate reachability using virtual probing

and machine motion around the real part).

To measurement live execution (with operator guidance and instructions projected live onto the part, in front of the operator's eyes, without having to worry about PC interactions).

To complete with a full reporting (real-time analysis results display on the fly over the measured part, including gaze-tracking stickers display, colour mapping and other readily available standard Metrolog X4 tools).

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Motorsport subcontractor accelerates productivity with hyperMILL

When Mark Goodman decided to set up his own machine shop, the motorsport engineer made sure that the first thing he bought with his first machine tool was a seat of hyperMILL CAM software from OPEN MIND Technologies.

With over 30 years expertise as a motorsport development engineer, that has taken in stints at Mercedes AMG, Cosworth and Red Bull, Mark Goodman knew the value of buying CAM software from OPEN MIND.

Seven years after starting Goodman Precision Engineering with a 2nd hand Bridgeport and a retrofitted optical rotary 4th axis, the Milton Keynes company has since spent close to £1m on plant and equipment to ensure it can serve its extremely demanding F1, Indy Car and general motorsport customer base. The machine shop now consists of three 5-axis Hurco machining centres, a Quaser MF400 5-axis and the latest arrivals at the start of 2017 are a Mazak VariAxis i500 5-axis machining centre and a Mazak Quickturn 200MY.

Mark Goodman recalls: "When I worked at a leading F1 engine manufacturer, the team did a lengthy and extensive study where their very experienced engineers trialled all the leading CAM vendors and the feasibility study ended with the team buying seats of hyperMILL. I had never used hyperMILL but I knew that if the top engineers in the industry had endorsed the software, I should buy it."

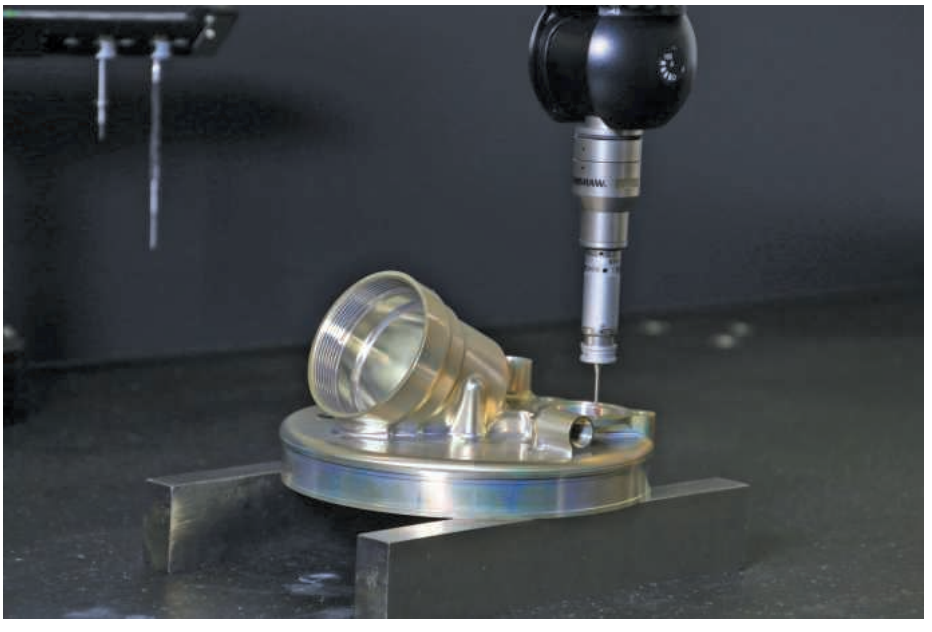
The 15-employee company now has four seats of hyperMILL with the latest arriving at the turn of 2017. The four seats drive all six of the company's 5-axis machines as well as the turning centres. The diverse selection of machine tools and the respective CNC controls at Goodman Precision would typically cause a meltdown for many subcontractors, but not for this Buckinghamshire business.

Mark Goodman says: "We never really use the CNC controls on the machines. All our programming is done off-line and the machines are all driven by the hyperMILL post-processors, so the type of control on the machine is irrelevant."

The company is predominantly manufacturing one-off, prototype and small batch powertrain, manifold and KERS components for many of the leading F1 teams. With four of its 15 staff programming hyperMILL, CAM programmers at Goodman Precision will program upwards of 180 new jobs each month. Many of the jobs at Goodman Precision have an average programming time of 2-3 hours with a machining time from 40 minutes to several hours for more complex parts. In contrast, KERS components can be required in batches of 1300+ with a machining time of less than 15 minutes for a single set-up with a multitude of parts. Upwards of 50 percent of the work at Goodman Precision is repeat business throughout the F1 season.

Paul Gould, an experienced programmer at Goodman Precision, says: "I have previously used a variety of CAM packages and hyperMILL is by far the best package that I have ever used. This isn't really a surprise as the OPEN MIND engineers are continually asking for feedback on how they can improve hyperMILL. If they continually feed information from customers to the developers, its no wonder the CAM solution is fast, efficient, easy to use and extremely intuitive. Downstream, it's reduced tooling consumption and costs, reduced spindle load on the machines and it's improved our cycle times.

"From a confidence perspective, the



hyperMILL collision detection system guarantees fail-safe programming as it factors in all the parameters within the machine tool such as the workholding, machine spindle and toolholding equipment as well as the kinematics of the machine and how the various features are factored in. We are frequently using the 5-axis and 3Dautomatic rest machining strategy that calculates where and how we can use a larger ball nosed tool than we usually would for profiling. This gives us faster cycle times and reduced tool changes as well as the ability to machine at higher feeds and speeds. This feature also maximises the full flute of the end mill with a larger step-over and this gives us much better surface finishes as well as shorter cycle times."

"Complementary to this feature is the ISO Machining strategy. This feature facilitates machining across several surfaces without retracting the tool. The global alignment strategy automatically determines the optimal milling direction based on the longest boundary of the selected surface. This allows us to define whether the machining proceeds diagonally or freely to the direction of machining. It saves us at least 10 percent in programming time as we don't need to manually input much detail and it also saves considerably more time on the machine."

Receiving most of its work in a variety of CAD files such as STEP, IGES, Solidworks, STL, DXF and many others, Goodman Precision opted to implement the hyperCAD-S CAD software from OPEN MIND just over two years ago.

MAXXimising productivity on the shop floor

The benefits of using hyperMILL for programming complex 5-axis parts in the fast-turnaround motorsport sector are giving Goodman Precision huge benefits in meeting the tight deadlines imposed by its customer base. However, hyperMILL is also making considerable inroads on turnaround times further downstream on the machine tools.

Mark Goodman concludes: "We have invested in the latest roughing module of the hyperMILL MAXX machining performance package from OPEN MIND and this has given us massive cycle time improvements when roughing steel, titanium and other challenging materials. The roughing and trochoidal milling cycles on hard materials are now over 70 percent faster and we have improved tool life by over 30 percent. We use harmonic helix solid carbide end mills and they are now cutting faster and at higher feeds with larger depths of cut than ever before. Parallel to this, the innovative strategies have reduced our spindle load by up to 50 percent whilst our tools can perform consistently for longer periods of time.''

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Trifibre's "Jigsaw" nests In Alphacam aid bottom line

It was an open and shut case when Leicester-based Trifibre was looking for CADCAM software to drive its new CNC router. It chose Alphacam and now, around five years later, it programs the company's Biesse Rover, a Morbidelli, and the original small Pacer.

Established in 1981, Trifibre Ltd has grown into the UK's leading case producer, providing innovative casing design and manufacturing solutions to a wide range of industry sectors including aerospace, surgical and medical, motorsport and automotive, and clothing.

Sales manager Trishanth Parari says that it specialises in working with major blue chip organisations, manufacturing flight cases that meet military specifications, bespoke polyprop cases, complex bespoke metal containers, made to measure metal fabrications, wooden packing crates, and custom made wooden and plastic presentation cases.

Trifibre invested in Alphacam when it purchased the Morbidelli to supplement the Pacer.

Trishanth Parari says: "Previously, everything was routed manually. We simply added tool paths to the DXF files. However, as the company grew we needed to reduce our labour time in producing drawings and preparing the machines.

"The shop floor workers were physically routing the panels every day, and it was becoming increasingly inefficient to machine the foam inserts on the single head Pacer, so we brought in the Morbidelli which was a pod and rail system, and we converted half the bed into a flat bed. As it's a twin-head machine we're able to run it in tandem, programmed with Alphacam."

Martin Clarke, project manager, says the next natural step was to further expand the CNC suite. "Moving from the single head Pacer to the twin head Morbidelli improved efficiency in terms of speed and accuracy in cutting the inserts, and they were passing through the factory faster than the panels. So we decided to purchase the Biesse Rover for routing the panels."

Alphacam is involved in almost everything he does.

Martin Clarke continues: "Everything that's machined, every hole, every pocket and the more time we invest upfront turns into savings of minutes and hours. What one person does with Alphacam in the office saves time for 20 people on the shop floor."

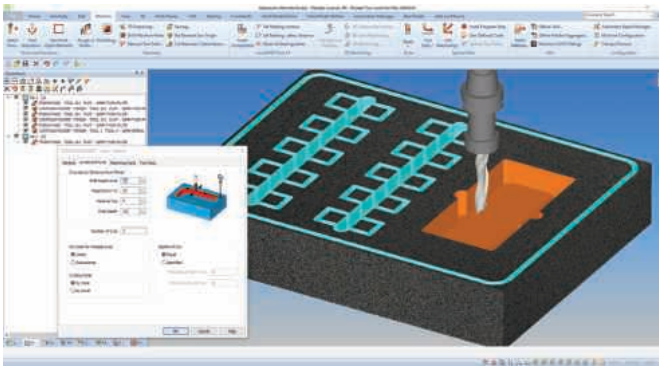
He says that, once a prototype is approved, programming all three machines with Alphacam enables him to produce the same product quickly and efficiently every time. The company uses specific software for designing its flight cases. The DXF file containing all the panel sizes, handle cut-outs and catch holes, is imported into Alphacam for the toolpaths to be added.

Martin Clarke says: "This goes to the shop floor where the CNC machine operators create the nests getting the most efficient yield from every sheet, even where we're producing one-offs. For example, we can create a jigsaw of 20 one-off cases on the same nest. A one-off flight case may only need a quarter or half sheet of Hexaboard plywood, but prior to using Alphacam we might have to use a full sheet.

"Waste is expensive, but Alphacam creates what is essentially a jigsaw puzzle for routing, compared to the straight cut saw and beam saw where you'd have to go right through a panel. On our widely used materials, such as Hexaboard, the yield is well up around 90 percent, so this represents considerable savings. Alphacam improves yield, and yield becomes profit margin, so Alphacam is directly contributing to our bottom line and profitability."

It also saves considerable time, which, again, improves efficiency and profitability.

Martin Clarke explains: "It varies from job to job, but the bare minimum is hours down to minutes. And when we're machining high production runs of the same case with a number of intricate routes, it can save us days."



Trishanth Parari says another aspect of Alphacam which plays a vital part in the production is simulation. "We're able to see what the end product is going to look like before we start to cut the material. It's also important to ensure that there aren't going to be any collisions during the manufacturing process."

He says having one software package to drive the routers from all three machine tool manufacturers makes their working lives considerably easier. "With Alphacam we have post processors set up for each CNC machine, so we can simply send the program to the shop floor knowing it will be absolutely right."

In conclusion, he says Alphacam means they can offer a maximum turnaround time of 14 working days on all orders, whether it's for one case, or 100.

Headquartered in England, Vero Software designs, develops, and supplies CADCAM and CAE software radically enhancing the efficiency of design and manufacturing processes, providing its customers with exceptional value through high productivity gains and significantly reducing time to market. The company's world-renowned brands include Alphacam, Cabinet Vision, Edgecam, Machining STRATEGIST, PEPS, Radan, SMIRT, SURFCAM, WorkNC and VISI, along with the production control MRP system Javelin. Despite the diversity of application, these solutions have one thing in common: they all address the rising challenges of achieving manufacturing efficiencies and bring huge value to the operations in which they are deployed.

Vero has direct offices in the UK, Germany, Italy, France, Japan, USA, Brazil, Netherlands, China, South Korea, Spain and India supplying products to more than 45 countries through its wholly owned subsidiaries and reseller network.

Vero is part of Hexagon (Nordic exchange: HEXA B), a leading global provider of information technologies that drive quality and productivity across geospatial and industrial enterprise applications.

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EMO 2017: Hall 25, Stand B20

CGTech to demonstrate VERICUT software version 8.1 at EMO

CGTech will exhibit its latest version of VERICUT 8.1, CNC machine simulation, verification and optimisation software at EMO. VERICUT 8.1 sees enhanced support for Force™ optimisation, a new Additive Manufacturing (AM) module being employed, along with, workpiece sectioning, X-Caliper measurement tool, report template, and grinding and dressing operations.

VERICUT's Force optimises NC programs by analysing cutting conditions such as force, chip thickness, and feed rate. In this latest version, Force can display graphs and charts in real-time, revealing cutting conditions and forces as they are encountered by cutting tools. This feature allows the NC programmer to identify undesirable cutting conditions such as excessive forces, chip loads, tool deflection, or material removal rates represented as spikes in the graphs. Force Charts are dynamically linked with VERICUT's NC Program Review, making it easy to review problem cutting conditions. With one click on the chart, the user is taken to the location in the CNC program and shown the actual cut in the graphics window. By optimising toolpath feed rates Force reduces production time, prolongs tool life, and produces a higher quality finished product.

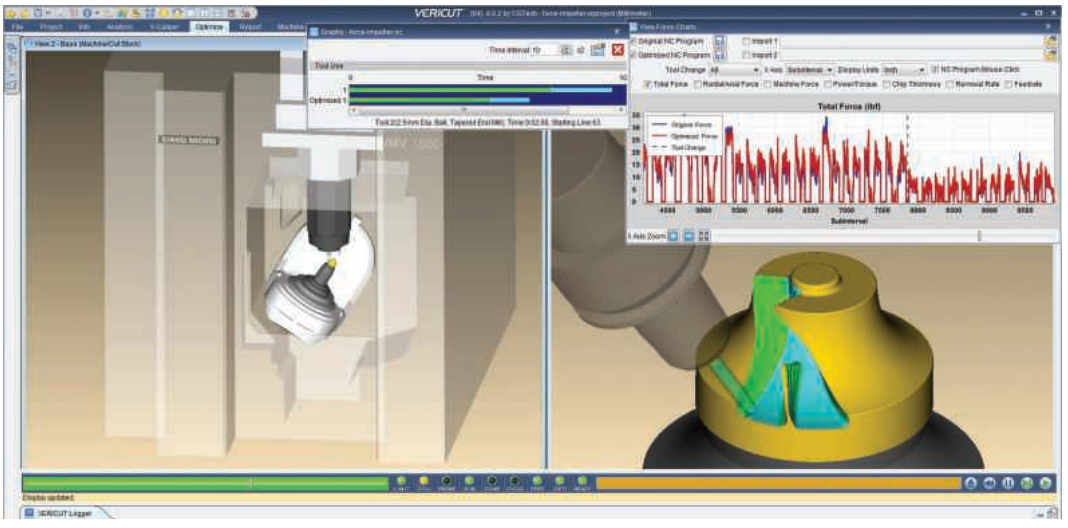
VERICUT's Additive module simulates both additive and traditional machining capabilities used in any order on hybrid CNC machines. Simulating both operations can identify potential problems that can occur when integrating additive methods. The user can access detailed 'history' stored with VERICUT's unique droplet technology, which saves programmers time by quickly identifying the source of errors, in most cases using a single mouse click.

It checks accurate laser cladding and material deposition, detects collisions between the machine and additive part, and finds errors, voids, and misplaced material. Users can virtually experiment with combining additive and metal removal processes to determine optimal safe hybrid manufacturing methods.

VERICUT's new section dialog makes it easier and faster to see inside a part during simulation. This allows the user to check proper fit, and identify interference between the workpiece and machine components. The X-Caliper measuring tool identifies model thickness, length, and width dimensions. In 8.1, measurements are shown on the part, and can be rotated with the part, zoomed, or dragged to a different location. Multiple dimensions can be displayed to quickly document key measurements with on part dimensions, and setup dimensions designed for inspection aids. Dimension images are easily referenced in VERICUT reports.

Enhanced support for grinding and dressing operations means users can now simulate dressing: where a secondary tool is applied to a grinding wheel to freshen the grinding surface, or to change the grinding wheel cutting shape. VERICUT can simulate the dynamic compensation needed while the dresser is used, even when the grinder is engaged with the part.

Since 1988, CGTech's product, VERICUT software, has become the industry standard for simulating CNC machining in order to detect errors, potential collisions, or areas of inefficiency. It is used by companies of all sizes, universities/trade schools, and government agencies in more than 55 countries. VERICUT enables you to eliminate the process of manually proving-out NC programs. It reduces scrap loss and rework. The program also optimizes NC programs in order to both save time and produce higher quality surface finish. VERICUT simulates all types of CNC machine tools, including those from leading manufacturers such as Mazak, Makino, DMG / Mori Seiki, Okuma, etc. VERICUT runs standalone, but can also be integrated with all leading CAM systems.



VERICUT is a 3D solids-based software program that interactively simulates the material removal process of an NC program. The program depicts multi-axis milling/drilling as well as multi-axis turning and combination mill/turn machining. It enables you to verify the accuracy and quality of your NC program. Inefficient motion or programming errors that could potentially ruin a part, damage the fixture, or break the cutting tool can be corrected before the program is run on an CNC machine tool.

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EMO 2017: Hall 25, Stand D07

Mastercam 2018 release integrates CoroPlus software

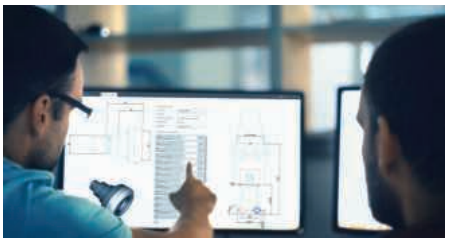
In a move designed to greatly improve efficiency and quality in CAM operations, CoroPlus® ToolLibrary and PrimeTurning™ method from Sandvik Coromant has been integrated in Mastercam® 2018. The CoroPlus suite of connected solutions facilitates digital machining and the transition of the manufacturing industry into Industry 4.0. Mastercam is the first CAM software to integrate solutions for both CoroPlus ToolLibrary and PrimeTurning technologies.

CoroPlus ToolLibrary is a digital tool library that removes the need for users to browse catalogues and webpages to find the required tool data. It also allows users to import tool assemblies directly into their CAM system and provides access to tool catalogues containing perfect digital representations of the physical tools. The planning of machining operations using the exact dimensions and models of the tools enables accuracy in CAM programming, thus reducing the risk of collisions during machining. Additional benefits include the considerable time savings created by eliminating the need to search catalogues and other sources for references. Furthermore, assurance is provided that different tool items will always fit together.

Users can find the tool simply by inputting the tool ordering code or using filter commands. The finished assemblies are then imported to Mastercam 2018 with the click of a button, ready for programming and simulation.

Pernilla Lindberg, product manager for CoroPlus ToolLibrary, says: "Selecting the right combination of tool holder, tool body and inserts is simplified and expedited using CoroPlus ToolLibrary. The library functionality is based on the ISO13399 tool data standard that permits users to import tool assemblies directly into their CAM package."

Another part of the new Mastercam release is an option for PrimeTurning. PrimeTurning™ software enables quick and accurate programming of PrimeTurning, a new methodology that allows machine shops to turn components in all directions with a single tool. CNC Software,



developers of the Mastercam software, have partnered with Sandvik Coromant to ensure that CAM users can create programs for PrimeTurning within Mastercam.

Mia Pålsson, senior manager product unit turning tools, says: "To ensure that machine shops maximise the benefit and huge potential of PrimeTurning, correct and smart programming is required, as well as optimised and easy tool selection. Helping to optimise manufacturing processes is a core focus at Sandvik Coromant.

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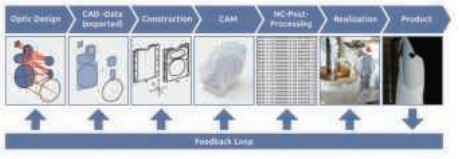
Unified CADCAM solution for ultra-precision machining

ModuleWorks, a leading supplier of CADCAM software components for machining and simulation, and ZEISS, an internationally leading technology enterprise operating in the fields of optics and optoelectronics, are developing a solution that combines conventional CAM and the requirements of ultra-precision machining in a single CADCAM system.

Ultra-precision machining is used for parts that need to be machined to an accuracy of just a few µm and a roughness in the range of nm. Optical parts require both types of machining, ultra-precision machining for the optically effective areas of the part and conventional machining for the non-optical areas. Until now, no single CADCAM system combines both types of machining in a single, integrated solution. The new system is powered by the ModuleWorks 64-bit optics kernel. The kernel is based on the industry proven ModuleWorks 5-axis technology for toolpath generation and has been specially developed to meet the



growing demand for high-precision machining of increasingly complex geometries in the optics industry.

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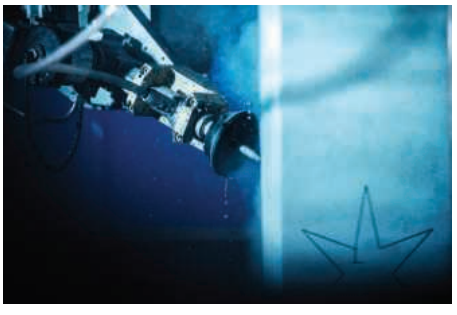
EMO 2017: Hall 25, Stand B26

Masters of free form, high precision, abrasive waterjet cutting in space

Machines for shaping 3D components in different work planes

As a result of material development, new and high-tech industries have a changing need for processing advanced 3D geometry parts. Hardened metals, special alloys and combined materials like composites are setting new requirements on material processing technology. The waterjet cutting process is often preferred for high-tech parts manufacturing, since a cold cutting process eliminates impact on material structure, with no micro cracks or heat affected zones. With a high precision and structured 5-axis machine system Water Jet Sweden has become master of designing machine tools for free form, high precision, water jet cutting in space, fulfilling the most challenging customer demands from leading aerospace, defence, and power industries around the world.



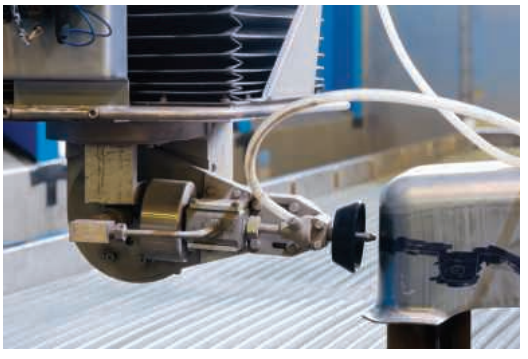
Featuring a world leading 3D abrasive waterjet cutting system

For decades, Water Jet Sweden has been developing its ability to build free form waterjet cutting tools into mastery. The Water Jet Sweden FiveX waterjet machine model is built with the most advance technology to repeatedly perform high precision free form cutting of full 3D parts. A Z-axis capacity of at least 1,000 mm gives a generous working area in the finishing of large and odd size parts. An intelligent Probe Interface is integrated with a large library of pre-designed 3D measurement cycles for quick setup and electronic abrasive feeders control and secure a continuous cutting process.

High precision with state-of-the-art performance and safety

Waterjet cutting hard materials in space requires an exceptionally stable machine design, especially if you intend to keep a repetition accuracy of ± 0.025 mm throughout the machine lifetime. Water Jet Sweden's FiveX waterjet machine is specially designed to counteract torsion, manage vibrations and handle irregularities during advanced 3D shaping. The machine is built on a heavy-duty steel frame with high walls and two independent Y-axis motors to steadily carry the cutting units and X-beam. The patented gantry design enables a smooth movement with less wear of mechanical parts and a more consistent cutting result.

Free form abrasive waterjet cutting in space requires specific safety features compared to traditional sheet material processing. The full-size walls not only give stability to the machine frame, but are also important safety barriers for the operator. Together with the automated back and front protection, the design enables cutting in all directions.



FiveX waterjet provides advantages for defence, aerospace and the power industry

Large-scale 5-axis processing allows the advantages of the waterjet cutting process to be utilised in the finishing of fabricated structures, pressed parts, moulded composite parts and other 3D components. The waterjet cutting technology has been embraced largely by the defense, space, aerospace and power industries. Designed materials such as hardened steel, titanium, Kevlar and carbon fibre can be cut easily to precise form. Applications include trimming of moulded parts into their final shape.

Waterjet cutting machines designed to meet specific customer needs

Each Water Jet Sweden FiveX machine is designed specifically to meet the unique production requirements of each customer. Customised probe function and fixturing table are common features. The particular machine solution shown in this article has a number of customer specific design features. A second cutting head parked on one side, when activated quickly turns into an efficient multiple head 2D cutting tool. The 2D head is armed with drilling unit, height sensor and electronic abrasive feeders to control and secure the cutting process. The custom water tank size enables one safe access door on each side of the machine for availability and easy operations.

On each side inside there is a handy operating panel and walking area for precise job setup, and spray nozzle with hose reel for quick and easy cleaning while loading and unloading. Another unique, customer specific, high precision, abrasive waterjet cutting system has reached a high-tech industry somewhere in the world, designed by engineers devoted to performance.

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ADVANCED WATERJET SYSTEMS

OMAX showcases new abrasive waterjet line at EMO

At EMO Hannover 2017, OMAX Corporation will showcase the newly released GlobalMAX 1530 abrasive waterjet. The GlobalMAX line brings value-priced abrasive waterjets with the OMAX guarantee to the global market. The OMAX 60120 and the latest generation MicroMAX abrasive waterjet systems will also be on display during the show in Hannover. Visitors will see live cutting demonstrations on all three waterjets and time studies run on the control software by software experts.

GlobalMAX 1530, a machine from OMAX's newest abrasive waterjet line, will be on display at EMO 2017

New GlobalMAX 1530 Abrasive Waterjet

The new GlobalMAX line is available exclusively through international distribution and incorporates two and a half decades of waterjet industry research and development. Like all OMAX waterjet systems, the pump, table and software in the GlobalMAX machines are designed, manufactured and tested as complete units at the OMAX headquarters in the USA.

"The GlobalMAX product line was created to extend our waterjet engineering and manufacturing technology base to more customers," says Stephen Bruner, vice president of marketing at OMAX Corporation. "The product line features our proven direct drive pump technology, easy-to-use software, and innovative drive technology. We build waterjet systems that help our customers make money in the short and long term and this product line is no exception. With GlobalMAX, OMAX aims to redefine value-oriented waterjets."

OMAX 60120 with Tilt-A-Jet Cutting Head

The bridge-style OMAX 60120 abrasive waterjet is capable of cutting complex parts up to 1.52 m by 3.05 m in size. The 60120 machine at EMO will be fitted with a Tilt-A-Jet cutting head, highlighting how OMAX waterjets can cut with virtually zero taper on part edges without slowing down cutting speed, ideal for work requiring tight tolerances and quick turnaround times.

Ultra-Precision MicroMAX

Visitors to the OMAX stand will also see the latest generation of the MicroMAX® with OMAX's proprietary linear traction drive system that uses optical encoders to provide positioning accuracy of 0.1 micron. MicroMAX's cutting table is mounted on a set of vibration isolators to minimise transmission of external vibration from the floor. A tank cooling package allows control of the tank water temperature, helping to avoid any dimensional changes in the material being machined.

Easy-to-use control software

EMO attendees can experience first-hand how OMAX waterjets are easy to operate. The Intelli-MAX control software was engineered specifically for use with abrasive waterjets and no special machine code knowledge is required to use it. A person unfamiliar with CNC machine operation can learn to cut parts on an OMAX waterjet in just a few hours. Online training for machine operation and maintenance is provided free, so customers can access training information whenever they need it and at their own pace.

In addition to being easy-to-use, Intelli-MAX software is compatible with more than 90 different file formats, including all major CAD program file types, plus graphics file formats such as .jpg, .gif, and .png files. This means almost any 2D or 3D part file can be imported directly into an OMAX waterjet controller and turned into a real part.

Distribution Network

Through its distribution network of 30 partners worldwide, OMAX Corporation has expanded its global reach and increased the availability of its precision-engineered technology. INNOMAX AG is OMAX's exclusive distribution partner for Germany and Austria will be at EMO to answer questions. In addition, there will be OMAX distributor partners from various countries, including Italy, Poland, Russia, UK, Hungary and Spain available at the show.

Based in Kent, Washington, OMAX Corporation is a leading manufacturer of advanced abrasive waterjet systems. Owner of the OMAX, MAXIEM, and GlobalMAX brands, the company designs waterjet systems that feature intuitive software, efficient pump technology, and a wide range of accessories. The ISO 9001:2015 certified company designs, manufactures, assembles and tests components as a complete system to ensure optimum performance. The company also has the most comprehensive service and support network in the waterjet industry to keep its customers ahead of the manufacturing curve. For more information visit the OMAX website or connect with the company on Facebook, Twitter, Linkedin and YouTube.

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EMO 2017: Hall 15, Stand E93

Waterjet Open Days 2017

The Resato Waterjet Technology Open Days 2017 will be held on 14th and 15th September at the company's headquarters in Assen, The Netherlands.

For the first time, customers are invited to come together to exchange information about the market and technology developments in waterjet cutting applications.

These Open Days will enable you to learn about waterjet cutting technology in workshops, training, panel discussions and other formats in which the Resato team will provide you with the knowledge to enable you to grow your business with state-of-the art technology.

You will also receive feedback tailored to your business and you will be able to add your point-of-view to discussions.

The Resato Waterjet and High Pressure technology staff will be in attendance throughout the event.

Over the two days, you will be able to explore as many areas of waterjet cutting as possible and your feedback will be used to improve the solutions that will bring gains to your business.

Several workshops will be held, including:

Choosing the right technology, with a comparison between waterjet, plasma and laser technology

Saving costs with cutting techniques and learning to cut parts more economically

Turning a drawing into a cut part from DXF drawing with 2D, 2.5D and 3D cutting

Mastering waterjet cutting software with advanced IGEMS CADCAM functions and upcoming software developments

Exploring service support tools with Resato Wiki/e-learning/CRAFT training

A greener waterjet cutting process including the latest trends and possibilities

Discovering the Resato environment with a guided plant tour

Resato International B.V. Tel: 0031 50501 6877
Email: info@resato.com www.resato.com

A quantum leap in reliability and productivity

New Mach 500 waterjet cutting system from Flow now available in Europe

Flow International Corporation, the world leading developer and manufacturer of ultra high-pressure waterjet machines for cutting applications, has announced the release of the Mach 500 in Europe, an entirely new waterjet system marking the arrival of a new industry standard.

The Mach 500 combines the latest in machine architecture and waterjet cutting technology with comprehensive service and support programs. The main fields of use are machining metals such as aluminium, stainless steel, copper and brass, synthetic and natural stone and composite materials as well as cutting glass and plastics.

Together, the latest generation of FlowXpert® 3D solid modelling CAD/CAM software and the recently introduced Compass™ 5-axis contour following and collision sensing solution enable the Mach 500 to make a quantum leap in terms of speed, precision and reliability, significantly boosting productivity. Flow will present this system at 'Schweißen+Schneiden' trade fair, taking place at Düsseldorf from 25 to 29 September 2017 (hall 13, booth 13A59D).

With the Mach 500, Flow has successfully doubled acceleration versus previous models. This means a 15 to 30 percent reduction in cycle time relative to the Mach 3b, the company's best-selling waterjet cutting system worldwide. The Mach 500's Z travel height is 50 percent larger (305 mm) and repeatability (0.03 mm) has been doubled. The modern electrical system improves reliability of the overall system and reduces complexity. The latest generation of FlowXpert CAD/CAM software is capable not only of designing complete 3D models and assemblies but also of simultaneously calculating optimum cutting paths.

"Over the last 40 years, we have developed 12 generations of waterjet cutting systems. With each generation, we have further improved major components and achieved ongoing increases in accuracy and cutting speed", explains Claus Herting, managing director of Flow Europe. "The Mach 500 is not only a modern waterjet cutting system. It combines the latest technology from leading manufacturers of drive and control systems with Flow's tried and trusted ultra high-pressure technology and unparalleled service and support to maximise machine availability and productivity for our customers."

The new Mach 500 waterjet cutting system from Flow International Corporation combines the latest architecture and cutting technology with a comprehensive service and support package

"The Mach 500 is unlike any other waterjet currently available in the industry," says James Jenson, Flow president. "The system is quicker, producing more parts in less time than any other machine we've offered and is a major advancement for the waterjet industry. We have combined technology and service to give our customers a whole new level of overall quality, performance and throughput."

Thanks to the modular architecture and numerous configuration options, the Mach 500 can be individually tailored to customer requirements. For example, a range of pump technologies and cutting heads are available. All pump models are connected via EtherCAT to enhance diagnostics and upgradeability. Compass, the optional, patented multiaxial contour following system, has an integral collision sensor and enables precision cutting even on uneven surfaces. Service and support packages can also be tailored to a customer's specific requirements. Options include preventive maintenance programs, replacement programs for high-pressure components, prompt delivery of replacement parts, technical assistance and a comprehensive training and development program.

Mach 500 is immediately available to customers in Europe and made its debut at the European market at LAMIERA, the sheet metal processing fair in Milan in May 2017: **https://www.youtube.com/watch?v=Tdw5oknMkNc**

Flow International Corporation, a Shape Technologies Group company, is a leading ultrahigh-pressure manufacturing process solution provider. As the world leader in waterjet technology, the company is committed to delivering highly innovative solutions and world class customer experience to a wide customer base.

Flow Europe GmbH, a subsidiary of Flow International Corporation, with a registered office in Weiterstadt, Germany and branch offices in England, France, Italy, Spain, Czech Republic and the United Arab Emirates, provides rapid technical assistance and ensures the smooth supply of replacement parts to all customers in Europe, the Middle East and Africa. For more information, contact:

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Email: info-uk@flowcorp.com
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Groundbreaking ceremony for new STM Research and Development Centre

STM Stein-Moser GmbH, headquartered in Eben, Germany, is expanding its company building by 1,400 m² to further advance its research and development objectives. The official ceremony took place.on the 12th of June, 2017.

The Austrian supplier of waterjet cutting systems will double the area of its company building in Eben in Pongau. Following the groundbreaking ceremony, the countdown has begun to the completion of the extension.

"We need more space for our research and development work. This is why we decided to start this project, "explains managing director Jürgen Moser, describing the intention behind the new building. The 1400 m² development centre, which is connected to the main building, is used to work on innovative products and improvements to the waterjet cutting systems used by the local specialist throughout the world.

Regional partners - internationally successful

According to the company philosophy of STM, the company is also working together with regional partners in its expansion. The project was planned by Tom Lechner, LP Architektur, and Peneder GmbH acts as a general contractor. In 2012, STM moved from Bischofshofen to the Eben business park to expand its production capacities.

"With its connection to the A10, the company's business location in the Eben business park is an optimal starting point to be internationally successful," explains Jürgen Moser.

Important investment project

The new building is another important investment project in the 27-year history of STM. "Continuous research and development is the cornerstone of our success," emphasises Jürgen Moser. "With the new building, we are also creating the conditions to serve our customers even better in the future and are optimally prepared for further growth."

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Two dissimilar siblings: intensifier and direct drive

Last autumn, KMT Waterjet Systems presented its two newest high-pressure pumps for waterjet cutting at the EuroBLECH industrial fair in Hannover: the models STREAMLINE PRO-III and TRILINE TL-I. The company's portfolio has therefore been expanded by two pumps that could not be any more different.

While the PRO-III series can generate up to 6,200 bar water pressure with its intensifier and can also handle the most challenging applications using its special technical equipment, the less expensive model TL-1 pump with its economical direct drive is positioned more as an entry-level model or as a supplier of high-pressure for simple cutting jobs. Thus, with its comprehensive product range in the field of high-pressure technology, KMT can offer the right solution for every requirement.

The STREAMLINE PRO-III pump model can uniquely establish itself at the top of the performance spectrum when it comes to waterjet cutting. The high-performance machine facilitates cutting with pressure up to 6,200 bar. The 125 PS (93 kW) represents the strongest combination of motor output and water pressure industry-wide.

Two cutting heads for optimum productivity

The STREAMLINE PRO-III allows their users to operate two cutting heads with a jet diameter of up to 0.28 mm in parallel. This doubles productivity, since two workpieces can be cut in parallel using it. A waterjet cutting system running with a STREAMLINE PRO-III 125 pump cuts a 3 cm stainless steel plate with average cutting quality at a speed of 110 mm/min, with two workpieces simultaneously. If a pump is run in the lower pressure range, such values are not achievable despite using larger jets.

In comparison, a pump with 100 PS (74 kW) enables a maximum jet size of 0.35 mm at 3,800 bar in two-head operation. Using optimum abrasives, the cutting speed with the same material and same cutting quality is maximum 71.5 mm/min. It is therefore over 50 percent slower than the machine with 6,000 bar. This not only saves time, but also material usage. Based on the given example, one metre cutting distance results in an abrasive consumption of 14.5 kg with PRO-III application or 30.8 kg for an application with 3,800 bar, a significant savings of 53 percent.

Production reliability at 6,200 bar

Assuming that the strong performance is at the expense of the reliability or the wear parts is an error, through an optimised and patented technology in the high-pressure seal of the intensifier, KMT is in the position to guarantee 500 hours for these highly stressed components with the purchase of a new high-pressure pump. The new SUPRAlife seal, due to its design, provides the service life that you are looking for in this pressure range. Therefore, waterjet cutting at 6,200 bar is considerably more efficient, since it actually extends the production time due to the new durable components. Some customers are already enjoying this new generation of high pressure pumps and up until now can only report positively.

TRILINE TL-I – the direct drive pump from KMT

At the other end of the performance spectrum, the TRILINE TL-I 30 pump type is an economical entry-level model in the world of waterjet cutting. This high-pressure pump is based on a direct drive, unusually for KMT. Here, an electric motor drives three camshaft-driven pistons via an easy-to-service V-belt pulley drive system, which in turn generates the high pressure water stream. The pistons work phase-shifted by 120°, so that the pressure signal is very constant even without pressure accumulators. In addition, the direct force transfer ensures a relative high efficiency of up to 85 percent. Compared to an intensifier pump, this drive concept requires no additional hydraulic circuit and is characterised in this by quieter operation and a smaller footprint for the machine.

The comparison: intensifier vs. direct drive

Naturally, the question arises as to how the two drive concepts are different, or even more importantly, which concept is best suited for which application. One thing is clear, both pump types have their reason for existence.

An indisputable advantage of the intensifier pumps is the maximum pressure range of up to 6,200 bar. A direct drive pump cannot get up to this volume and therefore the intensifier must be the first choice for all users that want to cut especially thick or hard materials, such as titanium or thick concrete plates. Even if the waterjet cutting machine is designed for high loads, e.g. in demanding multi-shift operations, a model with intensifier offers more, since this technology is more durable and the components last longer. As soon as the high-pressure pumps are connected to a network, the direct drive pump is completely out, since this technology does not allow for this type of connection. Lastly, it should be mentioned that the use of the intensifier technology is also recommended in cases in which the cutting process includes high switching cycles. This is mainly the case with pure water applications, when many individual parts should be produced with high cutting speed, such as when cutting rubber seals or applications in the

food industry. Here, the user of an intensifier pump profits in that the water pressure is maintained even with a closed valve and thus can be directly released again when the valve is opened.

In contrast to this, high switching time with direct drive leads to increased signs of wear, since this technology is characterised by a continuous water flow, which must be diverted with a closed cutting valve. The more often such diversion is required, the more the pressure control valve is stressed. The direct drive pump can therefore exploit their strengths even better with continuous cutting processes: The high efficiency of the pump increases the more the connected waterjet cutting system works without interruptions. For this reason, the TL-I model is better suited for abrasive applications. Compared to pure water applications the cutting speeds here are mainly lower, which also has the effect of a lower number of cutting cycles. Furthermore, the lower minimum pressure of a direct drive pump is an advantage with the processing of brittle or multi-layer materials: Since the TRILINE pumps can take the operating pressure down to a minimum of 100 bar, there is a lower risk of the material breaking when inserting into materials such as glass or ceramic and for multi-layer materials the risk of delamination decreases.

This demonstrates that KMT Waterjet Systems not only offers the most efficient high- pressure pumps in the industry, but also offers a solution for newcomers, with a broad spectrum of products between these two extremes. This stretches from high pressure pumps, which can be completely integrated into a turnkey total system, to pumps for autonomous operation with occasional use, up to highly developed machines for demanding cutting applications in multi-shift operations.

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EMO 2017: Hall 11, Stand B53

5-axis cutting head with direct drives

TCI high pressure, waterjet machinery is perfect for the precise cutting of all materials including steels, aluminium, marble, glass, plastics and other non-ferrous materials. Complex contour cutting is easily input through a simple interface or by importing CAD files.

3D cutting can be easily performed using the TCI unique 5-axis cutting head that uses direct drive motors with infinite loop so that there is no need to "unwind" the head for abrasive cutting applications. A 2.5 D dynamic head is available for jet lag compensation and kerf taper compensation.

Most TCI waterjet machines are extendable in size so that they can be configured to the exact requirements and budget for your application.

Prosaw waterjets have a robust, heavy duty construction with long life stainless steel tanks.

A precision, rack and pinion drive system, provides high speed positioning of the cutting head at a rate of one metre per second with increased reliability.

The TCI Cutting SM-M high pressure waterjet cutting machines allow the installation of a second independent table as well as the extension of the main cutting table, thus maximising performance.

The new TCI EXPERT HMI V 5.0 Operative machine interface is fully intuitive, offering complete management of the machine, incorporating the possibility of programming regular cutting parameters, constant control of the extraction system, consumables, etc. It also enables constant visual monitoring of the status of the cutting programme using a colour changing system.

Expert Cut configures and manages the types of waterjet attacks for every situation. An overall machine shut down can be activated between the various machine parts or restricted to just a few parts, using microcuts or pre-cuts. The system detects errors in both the design and the machining. It provides automatic attacks, manual and automatic shut-down, mechanical copying, customisation of machines and post-processors. This software enables technology tables for waterjet cutting specific to each machine, cutting speed reduction in the inside corners, and special penetration and multi-head control.

The Flex3D 5X is a specific application for automating the programming of waterjet cutters fitted with 5-axis heads. This application is fully compatible with the main 2D design systems used for working with sheet metal. The shapes can be imported in all formats, the relevant technology is then applied and finally the cutting itself is generated. This software has been designed so that the user only has to follow step by step the stages and instructions indicated by the software itself.

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Behringer "World of Saws 2017" announces developments for tomorrow's market

by Simon Smith, MD of Behringer Ltd

The Behringer in-house show "World of Saws" opened its doors this year once again, for the seventh time in June, at the company premises of the sawing machine manufacturer in Kirchardt. On an area of over 4,000 square metres, the company showcased a cross-section of its product spectrum of circular and bandsawing machines and equipment for the steel processing industry. Around 550 customers and potential buyers from over 30 countries made the journey to the premises of the main exhibitor Behringer GmbH, bandsawing machines, to experience an array of large-scale and combined plants which would be impossible to exhibit on this scale at any trade fair showground. Also taking part were its subsidiary Behringer Eisele GmbH from Weilheim/Teck, circular saws, and its French sister company Vernet Behringer, structural steel processing machines. Rösler GmbH, specialists in the field of shotblasting technology, was also present, showcasing the innovative surface treatment of steel sections. Together, the companies have created the "Partners 4 Steel" (P4S) Alliance with solutions from a single source, focusing particularly on the steel stockholding and processing industry.

The focus of attention was on economic and technological aspects of sawing technology both in technical presentations and also live at the machines. With topics such as "cutting of special materials" or "sawing technology meets intralogistics", the company was addressing some of the issues currently under discussion among experts in the industry. By taking part in an exciting tour through the factory halls, the visitors had the opportunity to experience the different sawing technologies on offer.

With the new HBE Dynamic Mitre Bandsaw, Behringer GmbH was not only looking to address customers' present needs. Christian Behringer, CEO, says: "We develop and think ahead for the markets of tomorrow. This new generation of mitre bandsawing machines is simple in terms of handling, offers a high cutting output and precise angles.

Visitors were also fascinated by the presented combination of sawing and robot technology. A robot equipped with a strong magnet gripped sawn sections from the sawing area of the circular and band sawing machine and deposited them on a cleaning station. Here, the chips were removed before the robot engaged the part again and placed it on a scale. The last step was to implement a signature on the cut surface and place the part in a crate.

Automated system solutions with combined production plants for profile steel machining were demonstrated by the company in the form of a networked sawing, drilling, shotblasting and preservation line. The Partners 4 Steel, Behringer, Vernet Behringer and Rösler, operate on the principle of providing everything from a single source.

Visitors had the chance to experience solutions for cutting slabs and large-format plates at an exhibit featuring large-scale band sawing machines.

Sawing large dimensions is an issue both for manual one-off cuts and for fully automated application in low-manned operation. We aimed to inspire our customers at the World of Saws and to encourage them to exchange expert knowledge with us at first hand during the exhibition.

Visitors also had the opportunity to experience lean foundry processes by taking part in a tour through the ultra-modern Behringer foundry. By joining forces to create an efficient team, designers and foundry specialists ensure that process optimisation is not just another buzz word.

For information and downloads, go to **www.worldofsaws.net**

HBE320-523GA dynamic mitre-cutting bandsaw

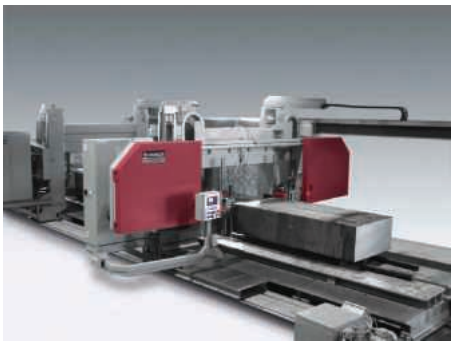
The new automatic bandsaws from the BEHRINGER HBE series allow all the benefits of modern high-performance machines for individual sawing assignments to be ideally combined with the tried and tested solid characteristics of a classic mitre saw.

Robot cell

Sawing, gripping, sorting and stacking with the utmost process reliability is possible using the new innovative saw-robot combination. Either a bandsawing machine like the HBE321A from Behringer (above) or a high-performance circular saw HCS150E from Behringer Eisele forms the central core of the plant upstream from the robot.

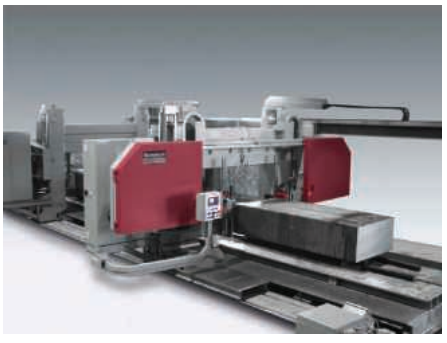
Automatic vertical bandsawing machine

The new fully automatic LPS40-160-4A comes with a range of neat technological features. Once clamped, heavy plates and slabs simply remain in position, and the vertical bandsawing machine takes care of the rest.



Larger-dimension saws: HBP1100-1500 Gantry

In this case, it is the machine and not the table that moves with the workpiece: In forging plants, steel mills and industries with comparitively tough working conditions, the workpieces are difficult to handle and can often weigh several tons. For this reason, the entire sawing frame in this gantry variant simple moves over the workpiece, sawing it at the defined location.



Partners 4 Steel

Three traditional companies have joined forces to cooperate in the interests of all steel manufacturers and processors, calling themselves Partners 4 Steel. Vernet

Behringer, a leading drilling plant manufacturer based in Dijon, Behringer GmbH, a globally active producer of innovative sawing technology, and surface treatment specialist Rösler Oberflächentechnik GmbH have worked together for many years in the field of complete sawing, drilling and shot blasting systems.

For further information on the Behringer Group range of products and services, contact Behringer Ltd, the UK branch of the Behringer Group of companies.

Behringer Ltd
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Email: simon.smith@behringerltd.co.uk
www.behringerltd.co.uk

EMO 2017: Hall 15, Stand D38

SafanDarley E Brakes help boost productivity by 30 percent

Wiltshire-based Alvan Blanch, a specialist in the design and manufacture of high-quality machines and integrated systems for the processing of agricultural produce and waste materials, has installed two of the UK's highest specification E-Brakes from SafanDarley. The purchase was prompted by a bottleneck in the company's press bay following investment in automation for its laser cutting and punching machines. The two new CNC press brakes are helping Alvan Blanch to achieve a 30 percent improvement in productivity through its bending section.

Founded in 1952, Alvan Blanch offers an exceptionally wide product range for the mechanical processing of crops. Around 80 percent of output is exported to over 100 countries worldwide, a feat that earned the 110-employee company a Queen's Award for International Trade in 2012. At its headquarters and UK manufacturing plant in Chelworth, near Malmesbury, core business is the production of continuous flow grain driers. The structure of these large, complex machinespredominantly comprises formed metal parts, a significant quantity of which are one-off per drier.

Press bay bottleneck

Alvan Blanch produces around 140 driers a year, which in turn dictates a high number of low-batch part quantities. The knock-on effect is a requirement for quick setups on the company's press brakes. Until recently, existing capacity was keeping pace, but an investment drive that witnessed the introduction of automated feeding systems for punching and laser cutting, created a bottleneck in the press bay that simply had to be addressed.

Production manager Neil Connor takes up the story: "Due to our growth and the acceleration of other processes on site, we had little choice but to invest in new press brakes. We looked at suitable machines across the market, including those from our existing supplier. However, the E-Brake 200-4100 NS machines from SafanDarley were the most advanced, not just in terms of their servo-electronic technology but also the user-friendly CNC. We're based in a small village in the Wiltshire countryside, so finding skilled labour is really difficult. If we lose a skilled operator through sickness for example, we sometimes need to assign a replacement who isn't necessarily familiar with the technology. If the press brake needs programming at the machine, this can prove problematic."

The ability to program the Safan Darley E-Brakes offline allows Alvan Blanch to assign unskilled labour to the machines, safe in the knowledge that they simply have to follow on-screen instructions to complete the task successfully.

"To emphasise this point, we have recently recruited two new operators who have never used press brakes before," says Neil Connor. "However, they've taken to the E-Brakes really well and are working away quite happily now, after just four weeks in the job."

Alvan Blanch traded in two of its four previous press brakes as part of the investment, so there are still four machines in total on site. The two new E-Brakes have boosted productivity by 30 percent to relieve the previous bottleneck.

Rapid setup

The SafanDarley machines have mainly been set to work handling the company's low-batch production work which, due to ease of setup and speed of tool changeover, has had the biggest impact on throughput.

"The tool change process is a lot faster and there are no spanners or Allen keys required," says Neil Connor. "Instead, the E-Brakes feature Smart Tool Locators for both the adapter and table that indicate tooling position during setup, while hydraulic tool clamping is served by the NSCL/NSCR-II-HC-Premium top tool adapter/crowning table. The ability to

change setup quickly will continue to serve us well moving forwards as we're constantly looking to design-out welded part in favour of pressed parts. This saves time, adds strength and simplifies assembly. Using our existing machines, tool change from a 25 to 50 mm vee takes 4-5 minutes. In some instances, we spend more time changing tools than bending the batch of parts. Conversely, the same tool change on the E-Brakes takes around 60 seconds."

Typical materials for formed parts at Alvan Blanch include 2-10 mm thick mild steel, as well as 1.5 mm galvanised cladding sheets. Many parts are heavy due to sizes that often start out as 4,000 x 1,500 mm flat sheet. Here, the E-mate programmable bending aids take the strain away from operators.

Self-teaching database

The company is also keen to praise the database within the E-Brakes. Programming can be completed quickly and accurately thanks to a 'self-teaching' database that stores information on materials, tools and previous, already-corrected bending routines.

"The database is really good," confirms Neil Connor. "Once you've bent a part, at that angle, on those tools, at that length and corrected it, the information is in there forever. We already have 15,000 bending programs in the database since the machines were installed in March 2017."

Another feature of benefit to Alvan Blanch is the E-Bend L Blue CNC-controlled laser angle measuring device, which helps improve quality and reduce reject levels. This patented system uses two blue laser sensors, one each side of the table, to constantly monitor and correct the position of the Y axis based on the actual product angle. E-Bend L Blue guarantees a final product with high angle precision. If necessary, the system automatically adjusts the crowning axis, Y1-Y2 axis and compensates for spring-back.

Advanced functionality

Further advanced capability on the SafanDarley E-Brakes at Alvan Blanch includes a 3D back-gauge system, CNC laser line projection on the sheet top side and an extra monitor for offline programming linking to in-house MRP/ERP systems. The additional monitor can also display work files or be used to view external bend simulations.

The new bending capacity and capability at Alvan Blanch is helping the company achieve genuine competitive gain, which is not easy in a truly global trading arena, as managing director Andrew Blanch acknowledges: "Around eight years ago, we made the strategic decision to invest heavily in the production side of our business. It was either that or cease manufacturing altogether. As it turned out, the decision proved to be very positive. We have doubled our turnover in the past five years and tripled it in the past eight. This has allowed us to upscale from the production of 30 continuous flow grain driers a year to in excess of 100. Investing in the two high-specification SafanDarley E-Brakes has been a key stage in our investment strategy, which is ongoing."

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Bystronic app optimises sheet metalworking processes

Swiss sheet metalworking machinery manufacturer, Bystronic, has introduced a new app that monitors in real time all processes taking place within its laser cutting machines, pressbrakes and waterjet cutting machines. The ByCockpit software fits neatly with the digital networking requirements of Industry 4.0. It evaluates the collected data and generates status reports, allowing factory output to be optimised.

During its development, Bystronic's IT specialists asked a number of companies how they retrieve information from their sheet metalworking machines to analyse and improve their production. Most said that extracting data and subsequently translating it into usable information is very time consuming. Often, results were only available infrequently, for example at the end of the month or even once per quarter, rendering the information virtually useless for process optimisation.

Running on a laptop, smartphone or tablet, ByCockpit generates reports while the machines are producing parts, providing immediate feedback so that action can be taken, if necessary. One report is the 'sunburst' view, which displays the status of the factory at a glance. Green bars indicate machines that are currently in operation, while a red bar signifies idle time. A blue bar denotes machines that are connected to an assembly line.

A tap on the screen switches the app from the sunburst view to, for example, the cutting overview for a ByStar Fiber. Six windows open to provide information about the laser cutting process. The status window shows the laser power output in kilowatts, the total operating hours of the machine and whether maintenance is due.

The performance window quantifies how efficiently the ByStar Fiber's production potential is being utilised, making it easy to see if processes are not running optimally. Maybe there were idle times, the target number of parts was not produced in the scheduled time, or the parts did not meet the required quality standard. If so, other windows show where the problem lies.

The material performance window shows how many usable parts have been cut using the ByStar Fiber and the amount of waste. The machine availability window breaks down the machine's run times, idle times and changeover times. If idle times are too long, another window provides information about the cause. Did the ByStar Fiber have to wait too long for raw metal sheets, or did parts that were not removed fast enough block the machine's shuttle table?

The sunburst view is one of several status reports in Bystronic's ByCockpit software. It displays the condition of an entire factory at a glance

The bending overview in ByCockpit allows optimisation of press brake productivity

The bending symbol is tapped to monitor press brake performance, which displays different windows to provide the information. For example, the ratio between the parts produced and the number of tool changes on a Bystronic Xpert press brake is an important parameter. If the number of tool changes is too high, overall production time increases, affecting productivity. All this information is provided in the performance window.

Tapping on the warehouse symbol reveals how many tons of aluminum, stainless steel, mild steel, copper or other materials are in stock, enabling timely reordering. ByCockpit also calculates the purchase value of the raw materials.

A menu of around 30 windows can be dragged, dropped and rescaled by the user so that the most appropriate modes are displayed to provide the best possible overview of a factory. The windows dynamically adapt to suit the size of the device's screen.

All Bystronic's latest-generation machines are ready to be connected to ByCockpit. A connectivity kit is installed as a gateway to each machine, which also acts as a firewall. Via this connection, machine data is collected, encrypted and sent to a cloud server. The highest standards of security ensure that no conclusions can be drawn in the cloud about a user's data. It is analysed and processed so that it can be visualised only in the customer's ByCockpit-enabled devices.

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Two new models of press brakes offer more bending flexibility

LVD Company nv has expanded its line of ToolCell automated tool changing press brakes with the ToolCell 220/30 Plus and ToolCell 220/40 Plus. The new Plus models can handle bend lengths of 3 and 4 m and have 220 tonnes of bending force. They feature an open height of 570 mm to accommodate higher tools. The new tools, 231 mm punches and 130 mm dies, allow the bending of parts with higher flanges.

LVD's ToolCell hydraulic press brake features an integrated tool changer and tool storage system. The machine automatically selects and places the tooling required for the job. While the operator is preparing parts for the next job, the machine unloads the previous tool setup and loads the next setup, all without manual intervention. The tool storage system offers a flexible tooling configuration to suit specific application requirements.

The new ToolCell Plus press brakes have a standard open height of 570 mm with a stroke of 300 mm. This can be enhanced to an opening of 670 mm and a stroke of 400 mm. This gives the flexibility to bend a wider range of parts, from simple to complex.

The accuracy of bending operations is assured with LVD's patented Easy-Form® Laser adaptive bending system, standard on all ToolCell models. Easy-Form Laser provides in-process angle monitoring via laser scanners located on the front and back of the press brake table. The system transmits information in real time to the CNC control, which adjusts to ensure the correct angle. The bending process is not interrupted, and no production time is lost. Using Easy-Form Laser, the machine is able to adapt to material variations such as sheet thickness, strain hardening and grain direction, automatically compensating for any changes. As a result, ToolCell delivers consistent bending results from the first part.

ToolCell is Industry 4.0-ready thanks to LVD's latest generation TOUCH-B control. TOUCH-B features intuitive graphical icons used to control all parameters of the machine, ensuring fast and efficient operation.

The control is linked to a central CADMAN® database where all production-relevant data is stored. This makes a fluent, digital transfer of production data from management systems to the shop floor possible. Communication to management, planning, production, quotation, costing, and other external software modules is handled via a standardised open interface.

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New torch with LED, laser & UV light for professionals

Developed according to user needs, the new Wiha torch with unique function combination increases efficiency and makes work easier.

Equipped with ingenious, practical functions: laser, UV light and a very strong LED lamp with two light levels, this new hand tool for users in trade and industry provides a variety of usage options and makes daily work easier in many respects. This practical little tool contains special features such as a retaining clip, magnetic positioning mechanism, and easy positioning and transmission of measurements thanks to the swivelling light head and permanent laser function.

Do you need to work efficiently in poorly lit work environments? Even the most experienced professionals with the best equipment find this difficult. Hand tool manufacturer Wiha has extended its range to include this new, handy, easy-to-use torch, which is designed to help when light conditions are poor. With a very strong LED lamp, this light is suitable for different work situations and light conditions thanks to the two distinct LED lighting levels at 280 lm and 100 lm, since dazzling light often reduces vision outside the light beam.

The torch includes multi-use functions and practical features, such as a laser, UV light, a swivelling head and a magnetic positioning mechanism.

The light includes a special swivelling L-shaped head, making it easier to point light in a required direction, while a retaining clip and a magnetic positioning mechanism also ensures hands can be free for other work. The integrated laser function with a unique press of a button provides detailed positioning and easy transmission of measurements for tasks such as ceiling installations. A switch-on interval of two seconds prevents the user from turning on the laser inadvertently. The compact light also features an integrated UV light, which is particularly useful for technical inspections. Combining these functions in a single torch means there is no need to carry around several, significantly heavier tools for different tasks.

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Welding in a world of digitisation

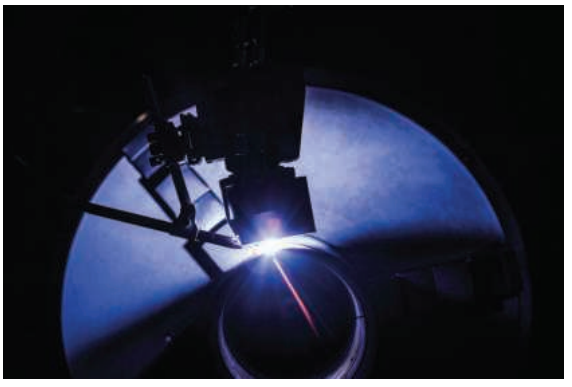
SCHWEISSEN & SCHNEIDEN 2017 will provide the ideal opportunity for Fronius to highlight its focus on digitisation. Challenges and solutions for thermal joining with respect to Industry 4.0 will form a core element of the company's trade fair stand. Fronius will showcase its digitisation solutions, including the WeldCube data management system, which can be used to gather and analyse welding data. Also on show will be the LaserHybrid welding process, which combines the advantages of laser and MIG processes and can now also be used with the intelligent TPS/i platform.

With ArcTig, Fronius presents a TIG solution for mechanised applications that achieves high welding speeds. From its manual welding portfolio, Fronius will introduce the new TIG series, consisting of the MagicWave 190, TransTig 230i and MagicWave 230i, which is ideally suited to the high demands placed on weld-seam quality. The flexible allrounder, the TransSteel 2200, will also be highlighted at the show. Thanks to its low weight and compatibility with three welding processes, it is up to almost any manual welding challenge.

The welding automation team will be presenting the latest generation of MAG welding carriages and orbital welding heads. As well as innovations for robotic, manual, resistance spot and automated welding, Fronius specialists will also be setting aside plenty of time to speak to visitors personally and to address any questions, interests or needs they may have. Visitors will also be able to see how the Fronius welding systems and power sources work first hand during live welding demonstrations.

Documenting, visualising and analysing welding data are becoming increasingly important in many production operations. With the WeldCube data management system, which will be showcased for the first time as an on-site variant (i.e. purely as a software solution), Fronius is making it possible to record, analyse and evaluate welding data across multiple power sources. This helps the user to identify potential areas for optimisation in welding production lines. Fronius is bringing new technologies in welding training to the table. The company's "Virtual Welducation" app takes a fun approach to welding with games, a quiz and an augmented-reality application.

To meet the challenge of increasingly quicker production processes yet with simultaneously high expectations regarding quality in robotic welding, Fronius offers the LaserHybrid welding process, which combines the advantages of the MIG and laser-beam processes. LaserHybrid can now also be used with advantages of the intelligent TPS/i platform. This means users benefit from the new, modular power source technology as well as new characteristics and processes. Fronius has also developed a mechanised application for TIG welding, which aims to achieve a high level of efficiency without compromising on the quality of the weld seam: using ArcTig dramatically reduces the need for preparatory work and rework. What is more, the welding process delivers much higher welding speeds than conventional TIG welding.

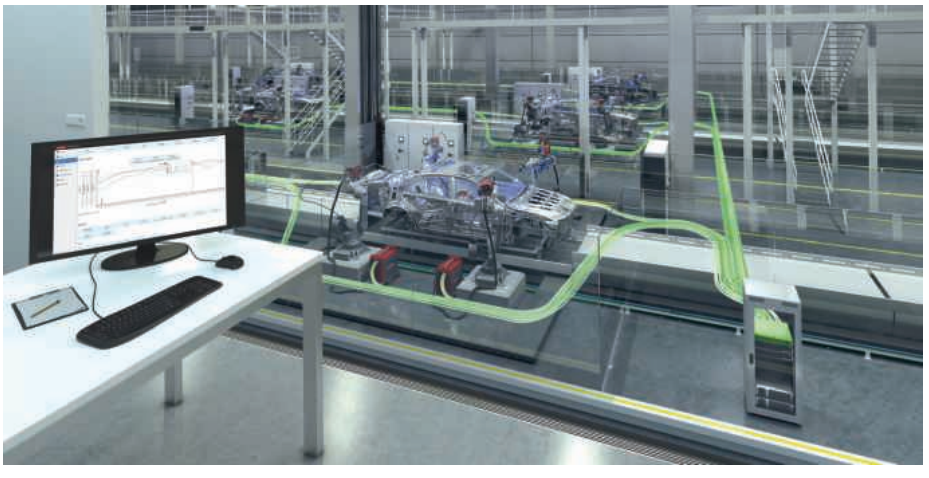


ArcTig: the mechanised TIG solution delivers high-quality results at high welding speeds

Fronius will also be presenting a new product series for manual TIG welding in Düsseldorf. The MagicWave 230i and the TransTig 230i are the first power sources from the manufacturer that can communicate with other devices using Bluetooth, WLAN and NFC technology. Manual welding systems are no exception when it comes to demands for ever more connectivity. The TIG solutions: the MagicWave 190 and 230i, plus the TransTig 230i, are ideal for applications that require a high weld-seam quality and perfect appearance.

Another innovation from the company enables users to flexibly solve a variety of day-to-day challenges: the TransSteel 2200 combines MMA, MIG/MAG and TIG welding in a single device, making it ideal for varied tasks. It is characterised by its user friendliness, robustness and long-term reliability and, weighing in at just 15.5 kg, is one of the lightest power sources for manual welding.

These new solutions will be on show at SCHWEISSEN & SCHNEIDEN in Düsseldorf **Hall 10, Stand F22/H22** from 25th to 29th September.



WeldCube: the data management system for recording, analysing and evaluating welding data across multiple power sources

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FANUC introduces new compact ARC welding robot

FANUC, the leading global manufacturer of factory automation solutions, is introducing a new high-specification ARC welding robot to its acclaimed ARC Mate series.

Succeeding the ARC Mate 100iC/12, the new ARC Mate 100iD will deliver significant productivity improvements for customers through its superior motion performance alongside simpler installation efforts and lower ownership costs thanks to its seamless integration with weld process equipment.

Boasting the highest axis speed and precision in its class, the ARC Mate 100iD can be operated intuitively from its new graphical user interface.

Ideally suited to narrow work spaces or inverted mounting, it delivers an optimised working envelope, reach and stroke for higher production throughput.

The ARC Mate 100iD features a fully integrated welding hosepack and cable management system with all cables and air pipes passing through the robot's hollow arm, wrist and body, eliminating the risk of external cables coming into contact with other equipment. This makes integration

easier while helping to optimise the lifespan of cables.

Through its improved wire feeder mounting, slim robot profile and footprint, the ARC Mate 100iD is the ideal choice when designing compact welding cells. Its payload remains at a class-leading 12 kg.

Like all FANUC robots, the ARC Mate 100iD supports many intelligent functions including built-in vision systems such as the FANUC developed iRVision system. It is also compatible with additional seam tracking sensors, cameras and gripping devices. Meanwhile, a broad range of Arc Welding software options and dedicated safety functions such as the acclaimed FANUC Dual Check Safety (DCS) control architecture can also be added. The ROBOGUIDE WeldPRO offline simulation PC tool helps boost the cell design and improves its engineering.

Andrew Armstrong of FANUC explains: "The FANUC ARC Mate range has become the reference point for welding robots thanks to its precision, reliability and integration capabilities. We have now refined the range further with the introduction of the ARC Mate 100iD which offers the same proven performance attributes alongside even greater flexibility, convenience and controllability."

For more information on FANUC's automation and robotics solutions, visit: **www.fanuc.eu/uk/en/industrial-automation**

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EMO 2017: Hall 25, Stand B60

WeldEye upgrades WPS and qualification management

85 percent faster prolongation of personnel qualifications and 95 percent faster sketching of welding joints

WeldEye simplifies welding management and now offers a single efficient and secure cloud solution to create and manage WPS and qualification base. Suitable for any size and type of company with welding operations, WeldEye welding procedure and qualification management software is up to 85 percent faster in prolonging personnel qualifications compared to traditional methods. It has the most user-friendly built-in drawing tool for sketching weld joints on the market. The tool enables creating sketches in just one minute, which is 95 percent faster than with traditional methods. Support for AWS, ASME, EN and ISO standards capitalises on the full potential of digitalised welding management.

Vesa Tiilikka, product manager for software at Kemppi Oy, says: "This is efficiency at its best in WPS and qualification management. WeldEye has been tested and proven to perform in an excellent way in the coordination of welders, operators and NDT personnel alike, regardless of the industry,"

WeldEye is an ideal choice for multisite welding management. It generates a range of EN ISO qualifications and enables convenient qualification prolongation with internal and third-party signatures automatically. It has a time-saving function for copying templates, it sends automatic certificate expiry warnings to your email and offers an advanced search function and content filtering. Welders' data is transferred automatically in connection with the creation of new qualification certificates, which results in significant time savings in qualification management. When used together with Kemppi X8 MIG Welder, WeldEye enables the use of revolutionary digital WPS.

Kemppi is a pioneering company within the welding industry. Its role is to develop solutions that ensure customers win business. Headquartered in Lahti, Finland, Kemppi employs over 600 welding experts in 17 countries and has a revenue of more than 110 m euros. Its offering includes welding solutions, intelligent equipment, welding management software and expert services, for both demanding industrial applications and ready-to-weld needs. Local expertise is available via its global partner network covering over 60 countries.

WeldEye

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Evolution of robotic welding

The welding industry has advanced to a point where robotic systems are being called upon more and more frequently to complete welding and bonding projects, thanks to their unrivalled speed, precision and efficiency.

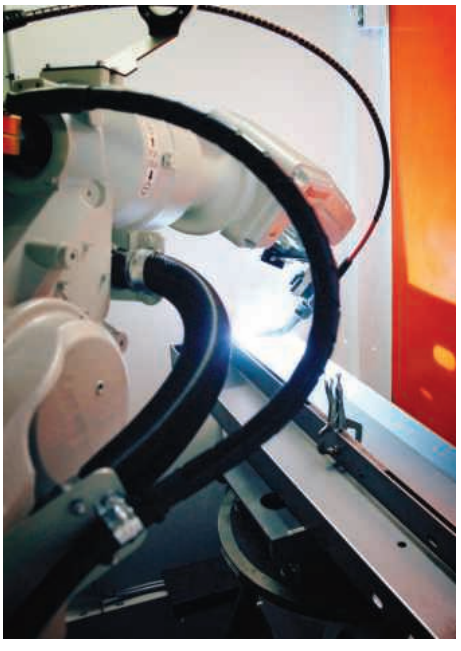
Charles Corner, managing director of full service sheet metalwork manufacturer, Malton Laser, discusses how robotic welding has evolved and, in turn, revolutionised the welding and fabrication sectors.

Metal welding has been an essential part of manufacturing for centuries, as far back as 3000 BC. From these early incarnations, when metal was heated and vigorously beaten together to form a bond, to modern-day methods utilising complete robotic processes, welding is an absolute necessity for a variety of products and infrastructures.

During the Industrial Revolution, Eli Whitney kick-started the beginnings of modern day manufacturing with the invention of the automated assembly line in 1797, a major milestone that revolutionised the manufacturing industry.

Despite this innovation, it wasn't until the 1860s that electrical welding came to the fore, thanks to the patenting of the first electrical welding system by Henry Wilde.

From this point electrical welding really took off and the early to mid-twentieth century saw engineers and manufacturers developing a host of different types of welding processes, including arc welding, flux cored welding and electron beam welding.



While these processes were very effective at forming strong, durable welds, the processes used to implement them often led to engineers working in very hazardous environments, including dealing with extreme heat and toxic fumes.

After years of operating in these hazardous conditions, everything changed for engineers in 1962, when the first industrial robotic welder was unveiled.

This robot, the UNIMATE, was invented by Americans George Devol and Joseph Engelberger and was first used by automobile manufacturer, General Motors. The UNIMATE implemented spot welding on cars as they moved through the company's assembly lines.

Utilising the UNIMATE revolutionised the way in which General Motors manufactured its vehicles. As well as completing welding tasks much more efficiently, the robotic system offered levels of precision and consistency that could not be rivalled by previous, manual methods.

After experiencing huge success with the robotic welding system, other car manufacturers including Chrysler, Ford and Fiat recognised the significant benefits of robotic welding and identified a necessity for the UNIMATE system in car manufacturing processes.

In addition to the speed the robot could carry out welding projects, it significantly reduced the number of mistakes made during the production process, as well as freeing-up valuable man power to be focussed in other areas.

In 1966, after many years of testing, development and refinement, full-scale production of the UNIMATE robotic welder began in Connecticut.

While Devol and Engelberger set up the first robotic welding company, other inventors and engineers soon caught on to the importance of robotics in manufacturing. During the 1960s and 70s many other robot manufacturers came to market, including KUKA, FANUC and Motoman.

Robotic welding really began to take off in the 1980s, particularly in the automotive industry. Other car manufacturers witnessed the success General Motors had experienced by implementing robotic

welding systems and began utilising this technology in their own factories.

Soon after, the benefits of robotic welding were beginning to be recognised by other industries, including metals manufacturing, and it's easy to see why.

Robotic welders guarantee precision, high-quality welds every time. The systems are also able to replicate these welds with the same quality, resulting in uniformity and consistency across the finished product.

In addition to unrivalled precision, these robots have the ability to reduce costs for manufacturers thanks to improved productivity on an assembly line. The systems also reduce health and safety risks by removing engineers from hazardous welding environments.

Malton Laser believes that these reasons alone are enough to cement robotic welding in the future of all manufacturing processes. It is dedicated to keeping up with the latest developments in automation technology and utilising it to become the leader in its field. Malton's belief in robotic welding technology is so strong that it has recently invested in a state-of-the-art two station Panasonic Tawers MAG 1600WG Welding Robot System, which it forecasts will increase the company's welding capacity by up to 30 percent.

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Telsonic launches subcontract ultrasonic plastic and metal welding services

Telsonic has announced that the comprehensive range of ultrasonic modules and systems available from the company have been complemented with the launch of a new subcontract welding service for plastic and metal components, within its Poole facility.

This service is available to manufacturers that may require additional production capacity or perhaps do not have sufficient volume to warrant the purchase of dedicated equipment. It also allows customers who are having bespoke systems built by Telsonic the opportunity to manufacture components using the same ultrasonic technology until such time as their system is ready for delivery - an ideal scenario for pre-production or low volume production.

Manufacturers are turning to ultrasonics

The quest for greater productivity, reduced energy consumption and costs are driving manufacturers to seek more efficient methods for assembly. This in turn has seen an increase in the demand for Telsonic's ultrasonic technology in both plastic and metal welding application areas.

Telsonic ultrasonic systems are ideally suited to subcontract assembly applications in plastic and metal

Telsonic ultrasonic modules and systems continue to gain ground in the production of automotive interior and exterior plastic sub-assemblies, while the company's metal welding technology is finding its way into an increasing number of wire splicing applications on harnesses and within panel building applications.

The company recently exhibited at Subcon 2017 and Telsonic's engineers were on hand to discuss the wide range of ultrasonic products available from the company, the new subcontract manufacturing service and also to provide advice and recommendations on customer's plastic and metal welding applications.

TELSONIC UK was established in 1977 and is based in Poole, Dorset. It has a complete laboratory with a full range of equipment and tooling for trials and demonstrations compemented by a team of engineers with over 100 years of experience. TELSONIC offers a full design facility using an FEA tooling package and joint design recommendations as part of the service. Its range of plastic welding equipment includes hand-held units, bench top systems and bespoke welding systems. A range of equipment is aimed at the OEM market to which it supplies actuators, generators, ultrasonic stacks (converters and boosters) including tooling for specialist machine builders to integrate into fully automated assembly systems. Other ultrasonic areas covered are: textile cut n seal, metal welding, ultrasonic cleaning and high power processing.

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Safer and more efficient welding with MultiStrike

Many welders today are still using two percent red-tipped thoriated tungsten electrodes, which contain radiotoxic thoria and therefore can be dangerous to health of those exposed to it, especially in the dust format from grinding the tips.

To overcome the accumulated hazardous thoria conditions, while maintaining a very high life expectancy for the tungsten electrode, Huntingdon Fusion Techniques HFT's blue-tipped MultiStrike® Tungsten Electrodes contain a mix of non-radioactive rare earth elements, eliminating the risk to health posed by radiotoxic thoriated tungsten electrodes.

A customer in the UK recently said: "The introduction of MultiStrike has been welcomed by all our welding staff. The new Tungsten Electrodes are giving excellent results and demonstrating much improved strike characteristics. Their life is significantly longer which is expected to lead to long-term cost savings. We are also aware of the health and safety benefits of using non-thoriated electrodes."

MultiStrikes can be used for welding aluminium with the AC process as well as steels and alloys with the DC process, which allows the welder to have just one type of tungsten electrode to weld all materials and reduce the amount of stocks and purchasing requisitions.

Other tungsten electrodes work at higher temperatures so their oxide additions (mostly radioactive) burn out, or evaporate much faster than those non-radioactive ingredients in MultiStrike, so much so that MultiStrikes give at least 10 times more arc striking capacity of other tungsten electrodes, when tested under the same conditions.

With most Tungsten Electrodes in use still containing radioactive and carcinogenic 2 percent thorium oxide, MultiStrikes provide the TIG and plasma welder with a safe and superior alternative.

Each packet comes with a traceability number to ensure that companies with a quality control procedure have traceability over another aspect of their joining processes.

A MultiStrike Tungsten Electrodes demonstration video is available at:
https://youtu.be/bx1BeepVMaw

Huntingdon Fusion Techniques HFT has a worldwide Exclusive Distributor network, which can be found at:
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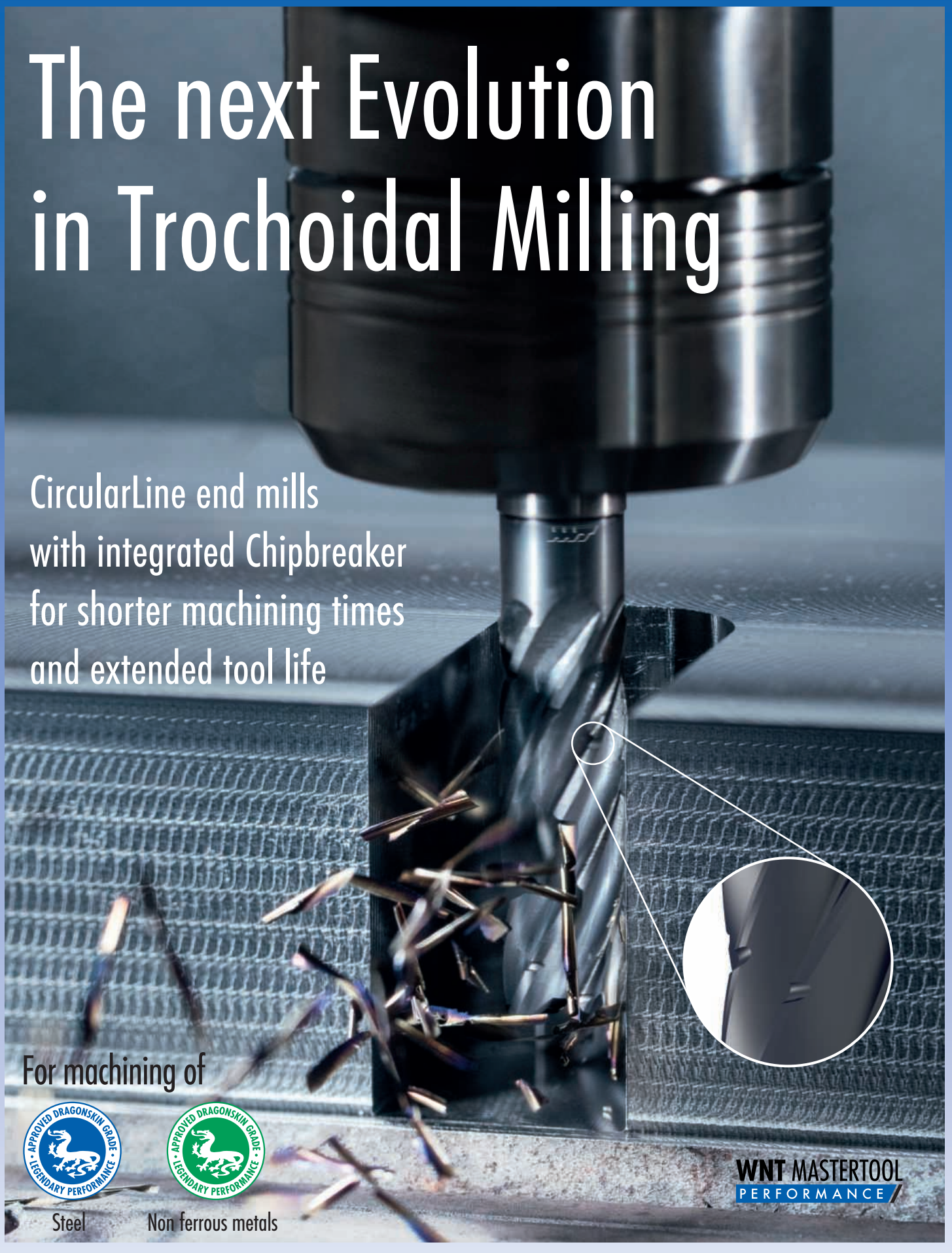

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