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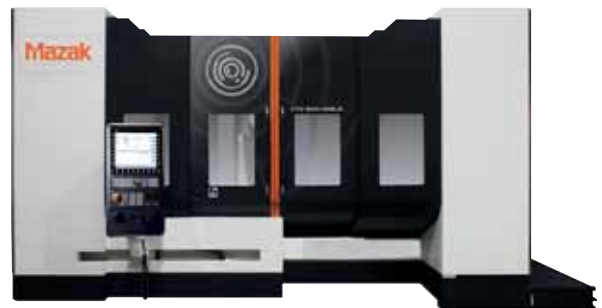
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Expansive Mazak machine portfolio for UK Siemens users

An alternative CNC option for those manufacturers who have standardised on Siemens control in their machining operations is now available across a number of models from Yamazaki Mazak's highly-popular Vertical Travelling Column (VTC) range of machine tools.

While Siemens controls are currently the most widely used machine tool controls in Europe and are a standard requirement in some aerospace and automotive supply chains, the Siemens CNC is now becoming increasingly prevalent amongst UK manufacturers.

The integration of Siemens CNC into the VTC range enables machine users to realise the benefits of Mazak technology without having to incorporate a new operator interface into its operations.



Targeting existing Siemens operators, Mazak worked closely with Siemens to integrate the control onto a number of Mazak machine models. The range includes Mazak's 5-axis VTC-800/30SR and VTC-800/30SDR machining centres, which operate using Siemens 840D sl, as well as the VTC-530C and VTC-760C variants, which operate using Siemens 828D control.

The integration follows the standard Siemens protocol, allowing operators to transition from other Siemens-controlled machines to Mazak Siemens machines with total confidence.

Both Siemens 840Dsl and 828D controls run on the latest SINUMERIK Operate HMI, the user-friendly operator interface which includes ShopMill conversational programming function and a large range of technology cycles for ease-of-programming.

Optimum milling performance is achieved with the SINUMERIK MDynamics function using Advanced Surface and Cycle 832 to provide high speed machining with precise surface finish.

Custom cycles and screens have been built into the CNC, combining standard Siemens operations with OEM-specific functionality, such as automatic setting of machine kinematics, tool change recovery and tool length setting.

For more information on Mazak's range of Siemens solutions, please visit: www.mazakeu.co.uk/mazak-siemens

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Dugard appointed UK agent for high-end Kitamura machine tools

Dugard Ltd has been appointed the sole UK & Ireland sales and distribution outlet for the world-renowned Kitamura brand of machine tools. The Kitamura Machinery motto is 'Limitless Creativity' and this has been established on a global stage since its inception in 1933 with machine tool technology that is genuinely 'World Class'.

The arrival of the Kitamura brand into the Dugard family is a huge coup for the Brighton-based machine tool company, especially as it was the Japanese manufacturer that sought out the sales, service and distribution expertise of Dugard to enhance its footprint in the UK market. The Kitamura range is renowned for its quality, precision, productivity and speed that place the machines in a well-recognised premium market position. Dugard has certainly jumped upon the quality of the brand, selling two machines in the first two weeks of the agency agreement, with dozens more enquiries already flooding in.

The range of products is extremely diverse, with the Mycenter HXiG and HXiTGA Series of horizontal machining centres both offering best in class performance. The Mycenter HXiG is available in sizes from the HX250iG (254 mm travel) to the HX800G with an envelope of 1,550 by 1,300 by 1,400 mm. The larger footprint HXiTGA range commences with the HX400iFTGA that has a 735 x 610 x 610 mm envelope through to the largest HX1250i that has an area of 2 m by 1.3 m by 1.37 m.

Both machines offer unparalleled precision with a positional accuracy of two microns and a repeatability precision of



one micron across the complete axes stroke. This is credit to linear scale feedback, patented twin ballscrew and twin servo motors and the hand scraping of every machine in the portfolio. From a productivity perspective, the twin-pallet configuration and astounding 60 m/min rapids combine with tool-to-tool changeover times of 1.2 seconds to provide unfathomable productivity gains.

From the vertical stable, Dugard can now offer the Mycenter 3XG and 3XiG, the 4XiF and 7X and the 2XD Sparkchanger. Like all the machines in the Kitamura portfolio, the VMCs are available with the Arumatik CNC control system that provides processing speeds up to 16 times faster than alternate CNC controls. Dugard customers undertaking 5-axis machining are already switching on to the extensive XT, Mytrunnion and MedCenter-5AX variants available.

For high-precision machining of large components, Dugard can also offer the industry leading line of double column Bridgecenter machining centres. The smallest Bridgecenter-6G provides a work envelope of 1.5 m by 1.1 m by 710 mm, stretching up to the Bridgecenter-12G that offers an envelope of 3 m by 1.6 by 800 mm.

Commenting upon Dugard becoming the UK sales agent for this prestigious brand, product sales manager at Dugard,



Colin Thomson says: "The arrival of the Kitamura brand marks an exciting time for Dugard and it genuinely brings a new dawn in the company's evolution. We now have one of the most prestigious, high-end machine tool brands in the market. Kitamura will outperform the majority of competitive brands in the industry, whether it is precision, productivity, capability or flexibility. The options available from Kitamura range from single, twin and multi-pallet systems with spindle, tool, build and control options that offer countless opportunities.

"By choosing to work in partnership with Dugard, Kitamura now has access to the Dugard service support network that delivers unparalleled levels of expertise and response times. This is already seeing existing Kitamura users in the UK approaching Dugard to find out more. We urge any existing Kitamura users to contact Dugard for more information regarding our services and support."

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Doosan Puma GT 2100, 2600 and 3100 high-performance lathes from Mills CNC in-stock now.

Not if - but when.



Once component manufacturers lay eyes on our Puma GT lathes - they want (at least) one.

And who can blame them?

Featuring a rigid box guideway construction these competitively-priced 8", 10" and 12" chuck lathes with their ultra-powerful spindles (up to 35kW/4500rpm) deliver exceptional accuracies, superior heavy-duty cutting performance and improved process reliability.

With driven tool models also available and all machines having a choice of control (Fanuc or Siemens), as well as being supplied as standard with auto tool setters and parts catchers - it's little wonder that they have become the 'go to' lathes for manufacturers machining high-precision parts.

Investing in a Puma GT lathe: it's not a matter of if...but when.

Mills CNC: Like No-one Else!

Injecting certainty into the moulding process

GF Machining Solutions' advanced die-sink machines are equipped with 3DS, an intelligent surface texturing technology that reduces friction on the surface area of moulds and, as a consequence, enables injection-moulded parts' manufacturers to improve productivity and performance.

Injection moulding process productivity can be compromised by de-moulding issues caused in many instances by increasing part and polymer complexity.

An effective and traditional method to overcome these issues is to apply coatings to the mould surface to reduce adhesion and friction enabling moulded parts to be ejected quickly. This coating process occurs after the machining operations, i.e. milling or EDM machining, have been completed and, as such, adds time and cost to the whole manufacturing process.

A new less time-consuming approach using advanced EDM die-sinking technology has been developed by GF Machining Solutions.

In essence, the new approach can be adopted by mould makers with access to the company's latest AgieCharmilles FORM P and FORM X die-sinking machines. They are equipped with the high-performance and digital Intelligent Speed Power Generator (ISPG) and 3DS, an onboard, intelligent surface texturing technology that can be accessed directly from the machines' HMI control.

3DS technology smoothes out the distance between the peaks and valleys on the mould surface, but not to a point where the peaks are eliminated. 3DS stretches the

surface RSM (Root Mean Square) value, without affecting the Ra value and, because the peaks are more evenly spread out, the surface that is created in the mould prevents sticking.

Owing to the reduced surface friction, moulds can be filled faster, shaving seconds off the moulding process and moulded parts can be ejected quickly and effortlessly.

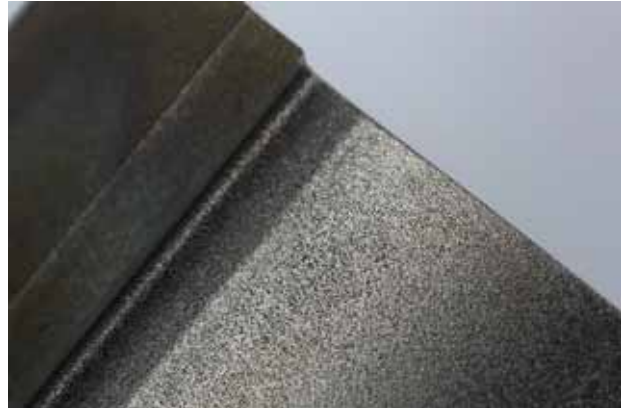
For manufacturers that make millions of injection-moulded parts, this enables significant cycle time reductions and the ability to make hundreds of thousands of additional parts.

The surface finish achieved using 3DS also reduces the likelihood of residue sticking to the mould after the plastic is injected. This is a particular problem that grows steadily worse after repeated injections, leading to uneven surface finishes on parts.

While a polished surface finish may seem ideal for every mould, this is not always the case.

A highly polished finish requires significantly more pressure to inject the liquified plastic into the mould. If the finish is too flat, or too smooth, the plastic sucks to the surface, like two pieces of glass with water in between them. This exceptionally strong suction effect slows the flow of plastic into the mould.

Additionally, greater ejection force is required to push the moulded part out of



the cavity because the smooth surface causes it to stick. If the newly-formed part is still warm and a bit soft, the ejector pins will push into it and deform its surface.

The optimised 3DS surface finish ensures less force is needed to eject a moulded part. Even if tiny plastic particles are still present, the amount is not enough to contaminate the surface.

In operation, a die-sink EDM machine with 3DS, after rough burning a mould cavity surface, follows the standard finishing operation but then activates the new 3DS function for the last two or three burn settings, to deliver the enhanced surface finish. The machine uses the same standard finishing electrode and the machining cycle time remains unchanged because, instead of using the last standard finishing parameters, the 3DS setting is simply implemented.

3DS technology is proven and successful. One GF Machining Solutions customer using 3DS technology recently reported a 30 percent reduction in maintenance costs. This same company has also been able to leave the mould in the moulding press 30 percent longer, without having to clean the mould surface and interrupt production.

This type of surface finishing has other applications outside of mould making. Any part that comes into contact with fluid, for example, will benefit from advanced surface quality to facilitate the fast and smooth flow of fluids.



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Tru-Tech Precision Engineering makes Excetek wire EDM investment based on trust

Tru-Tech Precision Engineering has established a reputation for quality and reliability within the high-tech industry sectors it supports. As well as the skills and expertise of its staff, the business stakes its longstanding reputation on the manufacturing equipment it relies upon. Here, an Excetek CNC wire EDM machine supplied by exclusive agent, Warwick Machine Tools, is meeting the demands set by the company.

Based in an impressive 5,000 ft² facility in Dundalk, Co. Louth, Ireland, Tru-Tech Precision Engineering was originally established in 1996 to provide subcontract centreless grinding services, predominantly to a number of customers in the medical device and technologies sector. It has built an enviable reputation as one of the leading manufacturers of high precision mould inserts for the medical moulding industry.

However, as the requirements of the customers changed over the years the company has invested in additional manufacturing technologies to meet these needs. Managing director, Joe Murphy explains: "That's not to say that centreless grinding is no longer a key part of our business. Around half of our turnover comes from the high precision centreless and form grinding services we provide to various industry sectors."

With an ongoing commitment to in-house research and development and continuous



investment in training and technology, Tru-Tech has equipped itself to meet and often exceed the growing demands of an increasing customer base that includes medical and healthcare, automotive, electronics, computing and telecoms. Alongside the CNC milling and turning machines on the shopfloor, a CNC EDM die sinking machine supports the company's ability to provide precision single and multiple mould tool cavities.

Joe Murphy recalls: "We have used an ONA die sinker for many years and Warwick Machine Tools' sales and service engineer, Paul Barry, has always been on hand to look after the machine for us, keeping it operating around-the-clock to match our workload. He was aware that we were having some issues with an old wire cut machine that was unreliable and expensive to repair, as well as being very slow in operation when it was working. During a visit to our facility, he mentioned the new Excetek V400G CNC wire cut machine and on paper the cost-to-performance ratio looked unbeatable."

Providing comparative performance levels to the existing Swiss and Japanese wire EDM machines, the new Excetek V400G offers a major cost saving against any equivalent size machine tool and the price includes training and installation. The new V400G has travels of 400 mm in the X-axis and 350 mm in the Y-axis to 350 mm. It can accommodate larger workpieces up to 750 x 550 x 215 mm weighing up to 500 kg with a compact overall footprint.

All the standard range of wire EDM machines from Excetek feature a C-frame structure, designed using FEA software, to provide exceptional accuracy in the linear axes movements and to minimise any thermal influence. The new V400G features a honeycomb frame structure for rigidity and thermal stability. The AC servo motor driven C1 class ball screws are cryogenically treated to minimise the thermal effects of the machine's ambient operational environment, with high accuracy linear scales fitted for accurate positional feedback.

The machine also features Excetek's latest corrosion-free electro discharge generator technology that improves cutting performance. While the cutting speed of every wire EDM machine is limited by the laws of physics and set by the thickness of the raw material being cut, it is a manufacturer's corner control that defines its machine accuracy. Excetek's software ensures the motion control and spark generator work together for the optimum power ramping and compensation dwell on corners, avoiding wire twist and reducing corner 'washout'. Wire diameters from



0.15 to 0.3 mm can be used and, for extended operation, a 50 kg jumbo wire feeder can also be fitted.

Joe Murphy explains: "The machine is very keenly priced and we were sending around 10,000 Euros of wire work out every month. Although the quality was good, we had very little control over the lead times. Now we have the ability to carry out the work in-house, we can control both the costs and the timescales."

The build quality and specification of the Excetek range is impressive and for Tru-Tech the automatic wire feed means the machine can run 'lights out' all through the night to ensure customers get their parts on time. The AWT offers the ability to thread the wire at the point of the breakage. An automated annealing system straightens the wire so that it can be threaded at the break point during machining with almost 100 percent reliability and without the need to return to the start position. Submerged wire threading is possible, which removes the need to drain and refill the tank. A water jet assist system is available for automatic wire feeds on tall workpieces.

As well as the ability to produce very accurate and detailed copper electrode for



the die sinking machine, the wire EDM has provided a further benefit with its ability to cut form grinding dressing blades from Syndite. A composite material that combines the hardness, abrasion resistance and thermal conductivity of diamond with the toughness of tungsten carbide, Syndite blades could take a couple of hours to produce on a digital Optidress wheel forming dresser. Using the Excetek V400G, Tru-Tech can now generate the blades in less than half an hour.

Joe Murphy concludes: "The positive

long-term relationship we have with Paul Barry was the foundation for the investment in the Excetek machine. We trust his reputation and made the choice knowing that he is based here in Ireland, so any support required would be readily available."

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WHAT MATTERS TO YOU? FASTER PROCESSING, SUPERIOR SURFACE FINISHES, LOWER COSTS

Makino is the world leader in EDM technology, providing faster processing times and superior surface finishes for even the most complex and involved part geometries. WIRE EDM machines combine a diverse mix of high performance capabilities, low operating costs, and advanced user-friendly operation that provide optimum efficiency on the production floor. By combining innovative Makino machine tools and software with NCMT's world-class specialist applications knowledge and expertise, shops of every size are competing and winning the kind of work that matters on the global EDM stage. All Makino EDM products utilize the modern Hyper i control system that delivers new levels of user-friendliness, with its high definition large 24" touch screen interface that makes use of Pinch, Swipe, and Spread touch functions similar to smartphones and tablets.



Sodick selection boils down to performance at kettle controls specialist

Strix Ltd, a world leader in kettle controls, has invested in the latest Sodick ALC600G wire erosion technology from Sodi-Tech EDM. As a result of its investment, the company has improved cutting speeds by 20-30 percent, saved significant sums in consumables and achieved far higher levels of reliability.

As a Tier 1 supplier of kettle controls to virtually all of the world's major kettle OEMs, Strix estimates that its products are used around one billion times a day worldwide. In total, the company has a 38 percent share of the global kettle controls market, a fact that has helped it grow into an 800-employee organisation.

Its global headquarters is near Castletown on the Isle of Man, which is supported by a manufacturing site just up the road, at Ramsey and a manufacturing/assembly facility in Guangzhou, China. Since 1982, when Strix was formed, the company has made many millions of kettle controls. In fact, the two billion mark was reached in November 2017.

With such a vast number of controls to make, the company is reliant not just on efficient production technology, but on class-leading toolmaking capability. With this thought in mind, Strix recently sought to upgrade its wire EDM machinery, which is used to make press tools for the myriad of electrical switch parts contained within the company's kettle controls.

John Roy, toolroom manager, explains: "We've had two wire EDMs working 24-7 for the past 18 years, so the time had come to consider making the leap to the latest technology. All of our press tooling is made from carbide, so wire EDM is the only realistic way of manufacturing."

John Roy and his team "looked at all the market suppliers of EDM machinery", scrutinising factors such as speed, finishing capability, running costs and price. After whittling the contenders down to a shortlist of two, the Sodick ALC600G emerged as the company's machine of choice.

Based on the latest digital innovations in generator technologies and the use of advanced electrode materials, the Sodick ALC range demonstrates considerable advances in cutting speed, accuracy and surface finish, at a cost-competitive price.

Duly installed, the new ALC600G has replaced one of the older wire EDMs on site at Strix and been set to work producing the press tooling, punches and dies required to produce electrical components such as the bi-metal discs that respond to steam and switch off the kettle. The press tools are often manufactured to produce two or three different components simultaneously.

John Roy says: "Our new Sodick wire EDM is also used to produce replacement punch and die inserts for existing press tools. We certainly have no shortage of work for the machine. It now runs 24 hours a day,



seven days a week. Although we only run a two-shift pattern, the machine is reliable enough to leave running unattended overnight and at weekends."

The press tools produced on the ALC600G come in many different shapes and sizes and typically feature high levels of complexity and tight tolerances, often 0.005 mm. Strix usually produces punches and dies in sets of five, ensuring it has a good level of stock so that production lines are not left waiting for tools. In terms of key performance measures, OEE (Overall Equipment Effectiveness) is measured on both the presses and the tooling, so quality is paramount.

John Roy concludes: "Our new Sodick has benefited the toolmaking operation at Strix in so many ways. Not only is the cutting speed 20-30 percent faster than our previous machine, but it is a lot more reliable and uses far less wire. The Sodick was quite a bit different to our old machine, but the excellent training delivered by Sodi-Tech EDM meant we became familiar in no time. In fact, the support has been really good in general. Being located on an island we rely on effective telephone support if we have a query and Sodi-Tech have not let us down."

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every wire EDM machine is limited by the laws of physics and set by the thickness of the raw material being cut, it is a manufacturer's corner control that defines its machine accuracy. Excetek's software ensures the motion control and spark generator work together for the optimum power ramping and compensation dwell on corners, avoiding wire twist and reducing corner 'washout'. Wire diameters from 0.15 to 0.3 mm can be used and, for extended operation, a 50 kg jumbo wire feeder can also be fitted.

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FANUC debuts dedicated IoT space at EDM technology day

FANUC has unveiled a new space dedicated to the Internet of Things (IoT) at its UK headquarters in Ansty Park, Coventry, as part of its latest technology day for Wire EDM.

On the day, several of FANUC's state-of-the-art ROBOCUT α-CiB Wire EDM machines were in live-cutting action. What's more, all production data was available to view in real-time in the new IoT area, as the space demonstrated the company's out-of-the-box MT-Linki machine tool monitoring service, which allows users to remotely monitor, harvest and analyse live production data.

Visitors were also able to get a first glimpse of FANUC's newest data connectivity platform, FIELD, which will fully launch later in 2019.

FANUC's α-CiB machine series comprises of compact, high-performance submerged wire-cutting machines with high rigidity and cutting accuracy. One of the stand-out features of the range is the built-in CORE STITCH function, which allows operators to extend unmanned machining hours by the

better planning of cutting jobs. Stitch points are set directly on the machine's CNC without the need for any pre-programming and, when used in combination with the wire path re-threading function, it offers the ideal solution for long-lasting unmanned machining and multi-workpiece cutting. Once the job is complete, operators simply knock-out the cores by hand, avoiding any risk of damaging the machine.

The α-CiB machine series also employs FANUC's AWF2 Automatic Wire Feed threading technology to provide fast, reliable automatic threading in just 10 seconds. Unlike other machines, the ROBOCUT series does not need to return to the starting point after a wire break, which radically reduces cycle times. To guarantee reliable threading and re-threading, wires are electronically cut to leave a pointed end which is truly straight and burr free.

Improved cutting control can also be achieved via the built-in iPulse 2 cutting function, which provides highly accurate corner control, regardless of material thickness or surface roughness.



As well as the new IoT area and dedicated Wire EDM demonstrations, visitors to the technology day were also able to see a host of other FANUC production machinery, including models from its ROBOSHOT injection moulding series, ROBODRILL compact 5-axis CNC machine tool series and a number of models from its broad portfolio of industrial robots.

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Braking news

A turnkey solution, developed by Mills CNC, helps deliver up to a 40 percent reduction in brake disc machining cycle times for a leading brake and clutch systems specialist.

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, recently supplied leading brake and clutch system specialist Alcon Components Ltd, with three new Doosan high-performance vertical turning lathes.

The three Doosan V8300 vertical turning lathes were installed at Alcon's Tamworth facility in June 2018 as part of a process improvement solution, designed by Mills CNC in partnership with Alcon production engineers, to manufacture the company's range of high-performance brake discs.

Alcon Components' advanced braking systems are used in the motorsport, automotive and defence sectors. The company supplies its systems and solutions direct to motorsport teams, to automotive OEMs and to defence contractors. It also manufactures braking systems for a large, internationally-based, after-market. Some 70 percent of the company's braking systems are manufactured for export.

Prior to the acquisition of the new Doosan lathes and the implementation of the new manufacturing process, Alcon machined its brake discs on three horizontal fixed head lathes.

These 'legacy' machines, while still performing satisfactorily, were relatively old, having been purchased in 1983 when Alcon Components was first established. As a consequence, the machines are slow and are increasingly prone to breakdown.

Brian Cutler, Alcon Component's production engineering manager explains: "Our business is growing and demand for

our braking systems is at an all time high. While this is clearly good news for the company, such an increase in demand was beginning to put pressure on our existing machining methods and manufacturing processes."

An internal review undertaken by Alcon identified that its brake disc manufacturing operation was a specific 'pinch point' that was affecting the company's overall productivity and operational efficiency.

Brain Cutler continues: "It was clear that we needed to invest in and significantly upgrade our brake disc manufacturing cell. We made the decision with the new cell to move away from horizontal lathes in favour of vertical turning lathes and drew up a list of machine tool manufacturers who could not only supply the new machines but who could also develop a robust, flexible and repeatable machining process."

Vertical turning lathes are best suited for machining wheel, plate and disc-shaped components which are characterised by their relatively large diameters and short lengths.

The machining process on a vertical turning lathe is inherently stable. With vertical turning lathes the workpieces stand upright and need less clamping force, due to the effects of gravity, than when horizontal lathes are used. They also enable higher cutting forces to be applied which improves removal rates and reduces cycle times.

Alcon already had a pre-existing relationship with Mills CNC and, in the last seven years, had made significant investment in a number of Doosan CNC



machine tools. These included horizontal and vertical machining centres and multi-tasking lathes.

Brian Cutler adds: "We have a good relationship with Mills CNC. Doosan machines deliver excellent performance and they are competitively priced. The machines are also backed up by Mills' technical and after-sales services which are also first-class."

The new flexible manufacturing cell at Alcon comprises three new Doosan 15" chuck V8300 vertical turning lathes with FANUC controls.

The machines feature an integral box guideway design that helps reduce vibration and facilitates heavy-duty and high-precision machining. All three machines are equipped with powerful 45 kW/2,000 rpm, high-torque, 2,592 Nm spindles and fast servo-driven turrets for rapid indexing and accurate positioning.

The machines have large axis travels of 495 mm, X-axis and 780 mm, Z-axis, a maximum turning diameter of 830 mm and a 750 mm maximum turning height. The machines are fast with 20 m/min rapid rates on their X- and Z-axes.

The V8300 lathes at Alcon are positioned in close proximity to each other, enabling rapid part transfer between them and are being used to machine a range of different sized brake discs.

The discs are made from cast iron castings and are machined to tight tolerances and high surface finishes in low volumes. Alcon currently machines approximately 500-600 discs per week in the new cell.

Mills CNC Ltd
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Maverick looks to the future with XYZ

Having worked for several years at two of Scotland's leading manufacturers of bagpipes, Geordie Hunter decided in 2014 that the time was right for him to become his own boss. Epitomising the 'one man in a shed' approach, he started his business, Maverick, in a small industrial unit with a manual lathe producing practice chanters, an essential accessory for any budding or experienced bagpipe player. While little known by those outside of the bagpipe fraternity, the manufacture of practice chanters is a very competitive market, so Geordie Hunter knew he had to be better and different to succeed.

An experienced player himself, he put his knowledge to good use to create exceptional chanters and added an element of flair by importing multi-coloured wood laminates that give Maverick Chanters their distinctive and unique look. As the only manufacturer of coloured chanters, Maverick's reputation grew and sales, both in the home market and overseas to countries such as the USA, Canada, New Zealand Germany and Denmark, quickly developed.

Geordie Hunter comments: "When I started Maverick, it was just me and a manual lathe, which meant I had to subcontract some of the machining of the metal elements of the chanters. This was a disadvantage for me as a start-up company as suppliers needed minimum orders, which impacted on cashflow and meant keeping

stock of products that were still being refined and developed."

With the increase in business, it became obvious that further investment would have to be made to keep up with demand. This saw the arrival in May 2018 of an XYZ SLX 1630 ProTURN lathe. The immediate impact of the SLX lathe was that much of the subcontracted work could be brought back in-house and allowed Maverick to produce what it wanted, when it wanted, with lead times now virtually non-existent for machining parts. With the arrival of this XYZ lathe, Geordie Hunter was able to expand further by taking on his first employee to help with some of the initial manufacturing processes, such as blocking out the laminate for turning.

Geordie Hunter says: "One major advantage of the XYZ SLX lathe is the time it gives back to me. It is the equivalent of having another full-time member of staff, but at half the cost. The ease of programming of the ProtoTRAK control also made product development much quicker, allowing new designs to be brought to market sooner. I can download my experience and knowledge into the control, in terms of programming and leave the machine running while I get on with something else, whether that is product development, sales or hand-finishing the chanters ready for despatch, so two jobs get completed at the same time."

His previous CNC experience had all been



with G-code, but the move to the ProtoTRAK conversational control system was straightforward.

He explains: "It's really simple to use and I can write complicated programs in minutes at the control. I can then check this with the 3D simulation on-screen, which I find very accurate and the machine is then ready to go."

The time that has been released, through the efficiency of the XYZ SLX ProTURN lathe, has also allowed Maverick to create new opportunities and expand in other markets. With one eye still on manufacturing to the highest quality for discerning customers, Geordie Hunter has turned to another of his passions and is manufacturing components for some of the world's premium shotgun manufacturers.

He continues: "Without the SLX lathe, I couldn't have developed the business in the way I have. The subcontract turning that we are now taking on is growing to such an extent that it almost matches the turnover from the chanter business, which is great from a business sense as we are no longer reliant on a single market."

The XYZ SLX 1630 ProTURN lathe is the most compact machine in the ProTURN range, with a footprint of just 2,080 x 1,000 mm, but within that it provides excellent capacity and capability.

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Subcontractor trebles in size with the help of sliding-head lathes

Patented swarf management software allows extended unattended production

Since moving premises in Bicester at the beginning of 2015, subcontractor SRD Engineering has approximately trebled its turnover and headcount, a rate of growth that accelerated during 2018 due to the arrival of three new sliding-headstock (Swiss-type) CNC turning centres from Citizen Machinery.

Joining a 20 mm bar capacity Citizen Cincom L20 Type VII lathe installed in 2009, which helped the contract machinists to weather the recession, two further models for processing similar size stock were installed in March and August last year, followed by a 32 mm capacity machine in November. It is noteworthy that the decade-old lathe is currently running 24/7 and still holding tolerance well.

Top precision machining is essential in the 18,000 sq ft Bicester factory, as 60 percent of the company's business comes from Formula One, with most of the remainder received from customers in the aerospace and electronics sectors. Dimensional and concentricity tolerances down to 6 microns are held on some 50 to 60 mm long, 3 mm diameter components, for example.

To help achieve this level of accuracy reliably, even during unmanned running, all



of the latest sliding-head lathes are equipped with Citizen's LFV (Low Frequency Vibration) functionality. The patented system allows stringy swarf, generated when machining aluminium, stainless steel, nickel alloys, copper and plastics, to be broken into shorter chips, the length of which can be controlled by the cutting program.

Mark Bonham, joint managing director with his brother Paul of the 30 years' established, family-owned precision machinists, comments: "We had no hesitation in choosing the LFV option on the new Citizen lathes, as being a subcontractor, we have to process a broad variety of materials.

"Often they are not short chipping and it is difficult to break the swarf using chipbreaker geometry on the cutting tool and/or high-pressure coolant.

"With LFV, which acts in two CNC axes simultaneously and is part of the control's operating system, as distinct from a macro in the part program, it is possible to regulate chip size closely without compromising the life of the cutters. In fact, they tend to last longer and break less often."

He explained that not only can the length of the chip be specified in any given program according to the material being cut, but LFV can be applied to different parts of the cycle, for example when turning a deep groove in stainless steel, an operation that is particularly prone to producing a tangle of swarf.

The reason LFV is not necessarily applied continuously to a whole program is that the technology lengthens slightly those parts of



the cycle, due to repeated periods of air cutting lasting microseconds. It is this action that breaks the swarf into short chips and it also has the effect of improving penetration of coolant to the cutting zone, which is a prime reason for the extended tool life.

If a job is particularly price-sensitive, LFV use can be minimised or even switched off during manned operation, but the system is so flexible it can be reintroduced for lights-out running to ensure a full ghost shift's production in the bin the next morning, without fear of stringy swarf impairing turning and drilling efficiency and possibly recycling from the conveyor back into the working area and jamming the machine. Thus a weekend's worth of parts can be reliably produced, whereas without LFV there is a likelihood of only four hours of output before the lathe stops automatically in the absence of an operator to clear the swarf.



Mark Bonham concludes: "LFV chipbreaking is a huge selling point for Citizen turning centres. We visited their headquarters and showroom in Bushey to see a demonstration and it was clear that the technology is able to resolve a lot of difficulties related to swarf management and temperature control when turning and deep hole drilling. The benefits include better accuracy of machined components and longer tool life."

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Rigid 5-axis machining centre achieves high accuracy

With the GENOS M460V-5AX, Okuma, represented in the UK by NCMT, offers a 5-axis machining centre that provides highest quality at an entry-level price. Equipped with multiple hardware and software solutions for accurate and productive operations, the machine satisfies even the most demanding needs.

The Okuma GENOS M460V-5AX is an entry-level 5-axis machining centre that combines high manufacturing quality with economic properties. Capable of handling workpieces of 600 mm in diameter and 400 mm in height with a maximum weight of 300 kg, the CNC-machine is suitable for various applications. The new generation possesses a tool magazine capacity of 48, making the latest version of GENOS M460V-5AX also the most versatile model. Currently, the previous model with a tool magazine capacity of 32 is for sale at an exceptionally low price.

Equipped with a spindle that offers 15,000 min⁻¹, the machine tool achieves high productivity for a wide range of applications. Providing a maximum output of 22 kW and 199 Nm of maximum torque, the spindle processes even demanding materials with ease. Its five sets of bearings are lubricated with oil mist and therefore do not require maintenance. By providing through-spindle coolant, the spindle adds to the shower coolant function. Manufacturers benefit from a three-year spindle warranty that is not limited by any number of shifts or operating hours.

The machine tool guarantees close manufacturing tolerances and high precision. For efficient and accurate measuring, the machining centre is



equipped with a Renishaw RMP60 touch probe. The X, Y and Z axes possess an absolute scale. In addition to the hardware, intelligent technology applications like Machining Navi for reducing chatter or 5-Axis Auto Tuning System for compensating geometrical errors enhance the machine's accuracy further. As a result of these precision-improving measures, GENOS M460V-5AX achieves a positioning accuracy of 2 µm in X, Y and Z.

The GENOS M460V-5AX was created for maximum precision, stability and reliability. Its cast iron double-column machine bed is the most rigid and proven machine base in its class. Weighing 8,300 kg in total, it provides an extremely stable foundation. With more than 10,000 sets installed worldwide, the base is proven to be reliable. Also, the double-side support NC table stands out as it is the most rigid in its class.

For highest precision, the 5-axis machining centre is equipped with Okuma's Thermo-Friendly Concept. The concept includes a symmetric box-build double-column construction made of cast iron. To eliminate negative influence from the coolant and the heat of hot chips, the machine possesses a thermo-shield design. In addition, five temperature sensors in the machine and three sensors in the spindle measure temperature changes and allow for an active compensation of thermal deformation.

Okuma offers high precision for large dies

With over 50 years of experience and a production capacity of 40 units per month, Okuma is a leader in manufacturing double column machining centres. Currently, there are over 8,000 Okuma double column machines in use, of which roughly 3,500 are used in the automotive sector. Machines like the MCR-BIII or the recently introduced MCR-S are used by nearly every automotive manufacturer worldwide. Most cars on today's streets are therefore at least indirectly and partially manufactured by an Okuma machine.

Within the automotive sector, Okuma's double column machining centres are mainly used for manufacturing dies for the production of car body shells. This process poses various challenges, as the large workpieces require high dimensional accuracy. Dies also need to possess very smooth and clean surfaces. Achieving the required result is difficult because the manufacturing process can take several days. The long machining time makes the workpiece vulnerable to deviations, due to temperature changes and other external influences during the manufacturing process.

These problems are solved by multiple highly-tailored applications and features. Okuma's Thermo-Friendly Concept helps to both minimise the amount of heat generated and compensate thermal deformations that cannot be avoided. The premium solution hyper-surface allows for excellent surface quality by correcting machining data automatically, which improves overall quality and eliminates the need for hand-finishing. The solid cast iron double column construction of the machines ensures great rigidity and close tolerances.



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New bar feeder for more efficient production of larger turned parts

Italian company lemca, a leading manufacturer of magazines for automatically feeding bar into CNC lathes, has introduced a new bar feeder designed to maximise productivity during unattended turning and mill-turning of larger diameter components in single-spindle, fixed-head lathes. Called Maestro 80, the long bar feeder is available in the UK and Ireland through sole agent 1st Machine Tool Accessories.

With over 100,000 bar magazine installations worldwide, a quarter of which are for material over 65 mm diameter, lemca has over 45 years' experience of feeding large diameter bar. Among the innovative design features incorporated into the new magazine, three have been granted patents.

One protects ABACOS (Adaptive BAR Control System), a self-adjusting bar clamping arrangement. It is designed to carry out different operations, namely guiding the material, damping vibrations and tightening on the pusher, all without changing the guide channel over a material range of 10 mm to 80 mm diameter.

The ABACOS system can also handle non-round material, 10 mm to 65 mm hexagonal or 10 mm to 50 mm square, with a quick change of the bushes. Material length options are from 1,000 mm up to 3,200 mm, 3,700 mm or 4,200 mm, subject to a maximum single bar weight of 180 kg.

The widest spread of bar diameters that could previously be guided in one channel was 20 mm to 80 mm, an attribute of the lemca Master 80 HF magazine. A limitation of that model is that when feeding smaller diameter bar, especially when it is not straight or of poor quality, it is necessary to reduce the rotational speed.



Otherwise vibration can occur, compromising surface finish and/or dimensional accuracy of the component being produced.

On the Maestro 80, this is avoided by another patented feature, the VIBRA-DAMP COLLET with interchangeable inserts. It damps bar vibration by reducing its oscillation amplitude and lowers bending and torsional stresses on the bar.

A third patent has been granted to lemca for its HANDYLOQ quick change collet system, which allows manual exchange within three seconds without the need to use tools.

This results in bar changeover within 30 seconds and high spindle uptime. Return on investment is therefore fast, both in the bar feeder and the machine tool.

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Making the move to 5-axis

T & T Precision was established in 1996 with the aim of supplying the local industries with high quality tailored engineering and tooling solutions. Since then, it has built a successful reputation of delivering trust, reliability, flexibility and quality as standard.

Brothers Victor and Finbarr Twohig were toolmakers by trade. They trained in electronics, but noticed that much of this work was going abroad, while the growing industry in Cork was in medical devices. With the help of some grants and while still holding down their day jobs, they opened a 4,000 sq ft factory and began designing and making their own medical equipment.

The company has expanded organically over the last 22 years, hand-picking both new markets and a skilled workforce as it grew. By investing in a team of 40, including highly skilled design, application and manufacturing engineers, it is showing consistent growth year upon year.

T&T Precision's design department is now creating workholding solutions and robot clamping for some of the largest medical device and aerospace companies in the

world. Designers work closely with the precision engineers to deliver strong design for manufacture solutions, seeing each concept through to completion using leading edge CNC machines.

After several expansions, the original factory had been outgrown. In 2015, T & T Precision moved to a state-of-the-art design and manufacturing facility on the outskirts of Cork, totalling 32,000 sq ft. It was already running a Haas lathe and wanted to invest in mills as well.

Victor Twohig says: "We knew Haas were very efficient, cost-effective and reliable machines. We chose a VF-2SS vertical machine with a 5-axis trunnion. It's a fast machine and our cycle times improved by 15 percent straight away.

"We found the transition to 5-axis machining easy and the gains have been huge in both reduction of man power and increase in quality. The purchase coincided with an increase in our workload; the machine simply powered through the orders."

T & T Precision has since added to its



inventory with a number of Universal Machining Centres (UMC), a VF-5SS and eight UMC-750, partly funded by government grants, that are directly related to the number of people the company employs.

The UMCs have a fully simultaneous 5-axis with T & T Precision opting to add 12,000-rpm spindle, through spindle coolant and high-speed machining for greater speed and accuracy.

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Water quality counts for ROCOL

The people at ROCOL have a reputation for solving difficult technical challenges, while producing cutting fluids and industrial lubrication products that offer significant advantages over the competition. ROCOL products are formulated and then tested on state-of-the-art equipment, which means customers can be sure of maximum performance every time.

One key element that the UK-based company is sure of is the overall performance of any soluble cutting fluid emulsion is partially dependant on the quality of the 'mixing water' used to prepare it.

The company considers three main features to indicate the quality of water. Firstly, freedom from bacterial contamination, secondly freedom from particular contamination and finally the amount of dissolved calcium and magnesium salts, referred to as total hardness often stated as a ppm (parts per million) value.

Water that is hard contains calcium and magnesium compounds, is naturally soft and contains few minerals. As it seeps through the ground it can pick up minerals, such as calcium and magnesium compounds, from the soil and rock it passes through.

If rain water passes through soft rocks like chalk or limestone, it picks up these minerals. If it passes through hard rocks, such as granite or through peaty soils, it does not pick up these minerals and so remains soft.

All UK mains water will meet regulatory quality measures. However, the total hardness of such water varies greatly across the country. Areas such as the South of England, where the majority of water is



supplied from underwater springs set into calcium rich ground, tend to have high levels of total hardness. Areas such as Scotland have relatively soft, or mineral free, water.

Total water hardness is usually measured in ppm. It is generally accepted that the ideal water hardness for preparing cutting fluid is around 90 ppm. If the water is softer than this, then excess foaming can be a problem. If the total hardness increases above this level other problems can be encountered.

Effects of hard water

If the hardness of the mixing water exceeds 300 ppm, then fluid performance will always tend to be compromised. High levels of hardness minerals in water will affect both fluid performance and sump life. These minerals react with the chemical emulsifiers and cause emulsion instability. This can

result in poor cutting performance, reduced corrosion protection and a tendency for the fluid to split, separate back to oil and water. The minerals can also react with various other additives and lead to the generation of insoluble hard water soap or scum.

Most cutting fluid formulations can initially cope with even the hardest UK water. The real problems start as mineral levels rise, due to the need to constantly top up systems with fresh fluid. The need to top up systems is caused by 'drag out' on swarf and evaporation of the water phase, due to heat. This evaporation concentrates the hardness minerals in the remaining fluid; then, as the system is topped up, fresh minerals from the supply water are added. This process continues with every top up gradually increasing the total hardness of the fluid until it reaches problem levels.

The rate at which total hardness increases



will vary from machine to machine and will depend on factors such as the initial water quality, the amount of fluid dragged out by swarf, the amount of heat generated during the machining process and even the design of the coolant tank.

Where cutting fluid performance is compromised by water quality, it is sometimes cost-effective to consider using treated water, which will have a positive effect on the life of the cutting fluid but a short term, negative impact on the profit margin, as water treatment equipment would need to be purchased. However, the use of ROCOL's Ultracut HW, EP and semi-synthetic range of cutting fluids can help to minimise the associated problems.

Why cleanliness is key

While it is true that there are many factors that can influence the working life of a cutting fluid, such as dilution control, tramp oil, top up rates and so on, the key to ensuring maximum sump life from any fresh fill is machine cleanliness.

During use, machine tool fluid systems become contaminated with tramp oil, machining debris, hard water soaps and the like that can be found on the sides and bottoms of tanks. These deposits are ideal breeding grounds for both bacterial and fungal infections and eventually become 'biomasses' that can significantly shorten the expected fluid life.

It is therefore essential that, when any fill of cutting fluid has been identified as reaching the end of its effective life, the system is thoroughly cleaned and disinfected. Simply pumping out and re-filling is not a cost-effective alternative to this recommendation.

Even where the cutting fluid condition appears to be good, with no obvious



symptoms of degradation, good working practice dictates that fluid systems benefit from annual maintenance, which minimises the risk of unplanned downtime and ensures safe working conditions for operators.

Failing to prepare is preparing to fail and, as with most jobs, preparation is paramount when cleaning a machine tool. Prior to commencing this work, it is a good idea to ensure that waste containers have sufficient capacity to hold the spent fluid. The appropriate volume of machine tool system cleaner must be available to ensure the job gets completed in a timely fashion. Obviously, there should be enough fresh fluid available to refill and subsequently top-up the system. Replacement filters should be available where required and the appropriate PPE equipment should be available and used as necessary.

ROCOL's machine cleaning method follows a logical sequence that has been drawn together from years of experience gained in machine shops across the country. The first step is to introduce the appropriate machine tool cleaner, at the advised dilution ratio, into the old cutting fluid, ensuring the

system is full so that the machine cleaner contacts every surface in the tank.

Ideally this mixture is allowed to circulate for eight to 10 hours, but for a minimum of four hours. A good machine tool system cleaner allows the machine to remain in production during this cycle, so it should not impact on production capacity.

After the cleaner has had time to work, switch off the power and remove tank covers and the swarf conveyor where possible. The interior of the machine is then brushed down to remove debris. The old fluid can then be removed using a vacuum pump or similar. Always work from the fluid surface to avoid leaving a film of tramp oil on the surface of the tank.

The next step is to physically remove any solid debris from the tanks and conveyor. Remove and clean, or change, any filters and then rinse the system with clean water filling to the minimum level. The rinse water should be circulated for a few minutes and then pumped out until dry before the swarf conveyor and tank covers are replaced. The final step is to refill the tank with fresh cutting fluid and circulate immediately, catching the first few litres of the flow as this will be the last of the rinse water.

This method of cleaning a machine tool, prior to any fresh sump fills to maximise the working life of the fresh coolant, has been used in practise by ROCOL staff and customers for many years. It is a tried and tested formula. However, if you need any further help or advice please contact the ROCOL experts, as they will be happy to help.

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Wogaard Oil Saver supports Roscomac's strong family values

When Worthing-based Roscomac was established by Fernando Martello in 1976, the subcontract engineering business was founded on strong family values. During the following years, the business has done its utmost to maintain a 'family' environment, both within the company and embodied in its staff and its approach to customers. Today, the Wogaard Oil Saver is helping to support these key values.

With a passion for manufacturing an array of components and sub-assemblies using the very latest CNC technology, Roscomac has a broad range of machining competencies, with a focused approach to customer service and quality. This allows the business to successfully maintain its commercial relationships within a variety of industry sectors, including aerospace, medical science and instrumentation, oil & gas and general precision engineering.

Accredited to ISO 9001, component manufacture and supply is always totally aligned to customer specifications, processes and expectations, as either stand-alone parts or sub-assemblies, with design and product development critical elements of the Roscomac contribution.

Operating from an impressive manufacturing facility in Worthing, West Sussex, with technical customer support in Brno in the Czech Republic, the company employs almost 100 highly skilled and



knowledgeable staff working around-the-clock.

A continual investment programme means machine tool technology is regularly updated, with an older rail-type FMS currently being replaced by a cell of high-speed pallet fed 5-axis machining centres.

An array of Citizen Swiss-type sliding head lathes provide the majority of the turning and mill-turning capability for Roscomac, with 13 of them now fitted with the Wogaard Oil Saver.

As production manager, Sean Keet recalls: "We recently purchased a number of new Citizen lathes and were made aware of the capabilities of the Wogaard Oil Saver. I contacted Wogaard's managing director, Jason Hutt and after a visit onsite he helped us install the first unit completely free of charge for us to thoroughly evaluate it.

"It was a real eye-opener seeing the unit operate on that first machine, taking the neat oil back to the machine's sump. As anyone running sliding head lathes knows, oil dragged out by the swarf is a problem and previously we would try to allow our swarf bins to stand to let as much of the oil drain off. However, in a busy production environment working around-the-clock, that time is never really available."

The range of materials machined by Roscomac reflects the spectrum of industries the business supports. For high volume applications brass, steels and difficult to cut materials, swarf tends to form a "birds nest" around the cutting tool, requiring the machine to be stopped and the tangle of cut material to be broken up and removed. Citizen has addressed this with its new LFV (Low Frequency Vibration) technology that effectively breaks up the stringy swarf using oscillation of the axes and cutting tool.

Sean Keet explains: "Our new LFV equipped lathes can produce significantly



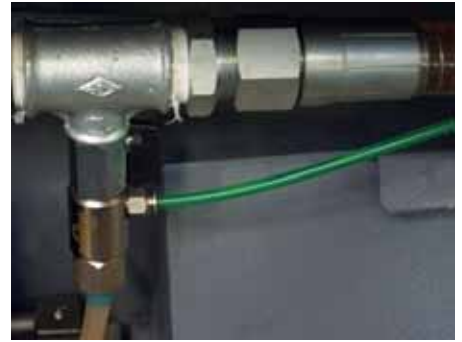
more components per shift, because there is no longer a need to interrupt the production run. Of course, that also dramatically increased the amount of low viscosity neat oil dragged out into the swarf bins."

Here, the Wogaard Oil Saver really proved its value, as Sean Keet confirms: "Smaller chips allow the neat oil to drain better and we had about seven litres a day accumulating in the bin at anything up to

£5 per litre. The Oil Saver quickly pulls this back into the sump of the machine and that alone would pretty much pay for every Wogaard unit we have in the factory. It is not like we spend a lot of time maintaining them, it's a fit and forget. Just put it in the swarf bin every day and check that its sucking up and your reclaiming your money."

Another positive factor noted by Roscomac is the reduction in sump top-ups with neat oil for the lathes. Before the Wogaard units were fitted, each lathe required replenishing up to three times each week, often with large volumes of neat oil. Sean Keet says: "Now we only have to refill the sumps once a week and, as the Oil Saver reclaims the coolant back from the swarf bin in to the same sump, there is no chance of cross-contamination. This amounts to a significant amount of time saved across all the sliding head lathes.

"Another winner for us is that the machine doesn't stop; it doesn't come up with that alarm saying it has run out of oil in the middle of the shift when there is no one else about. If you are looking to continuously run, and if you want any lights out running, it is not going to stop. If our staff are off getting



oil to fill up the machine, they are not adding any value, so we have the Wogaard Oil Saver silently helping to keep us running."

Sean Keet concludes: "One of the best things you can say about the Oil Saver is you don't have to manage it once you have made sure it is up and running, as we have. I don't know how many litres we have seen reclaimed, but it makes a positive impact on the environment and that is certainly part of Roscomac's core family values."

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Versatile and high-performance coolants

2019 has seen the successful launch of one of Oemeta's specialist, high-performance coolants

Launched in tandem at the Southern Manufacturing exhibition in Farnborough and the Intec international trade fair in Leipzig, Germany, NOVAMET 1000 S, also known as Bohrmilch 4.0, was a special focus at both shows.

Steeped in German engineering history, the word "Bohrmilch" translates as "drilling milk" and is celebrated as a quality, yet versatile machining coolant. Taking this tradition forward, with a focus on high-performance, Oemeta has reinvented this concept for modern-day machining in the form of Bohrmilch 4.0. It is a water-miscible coolant which embraces the traditional values of Bohrmilch, updated using the latest cutting-edge technology and specially selected raw materials.

Designed for today's advanced metalworking processes and legislation, NOVAMET 1000 S has proved itself in trials across varying materials and industries. One of the product's key features is its surface finishing. The product is designed for use on specialist materials and results have shown that it is particularly impressive when used on aluminium alloys and aluminium wrought alloys, making it, but not limiting it, to be the ideal coolant to use in the aerospace industry.

NOVAMET 1000 S has a high oil content, giving it great lubricity and low tool wear alongside many other impressive qualities, including high material compatibility, excellent corrosion protection, a good ability to work under high pressure, diverse process capabilities, low foaming, and low maintenance.

With health and safety legislation high on everyone's agenda, NOVAMET 1000 S ticks many boxes. It is free from boron and formaldehyde and it has good skin and environmental compatibility as well as low odour.

One of the great benefits of Oemeta UK is a free coolant performance benchmarking service. Oemeta understands that coolants are not always at the top of an engineering company's list but, once the right cutting fluids are in place, it can mean endless

positive improvements in many areas across the shop floor.

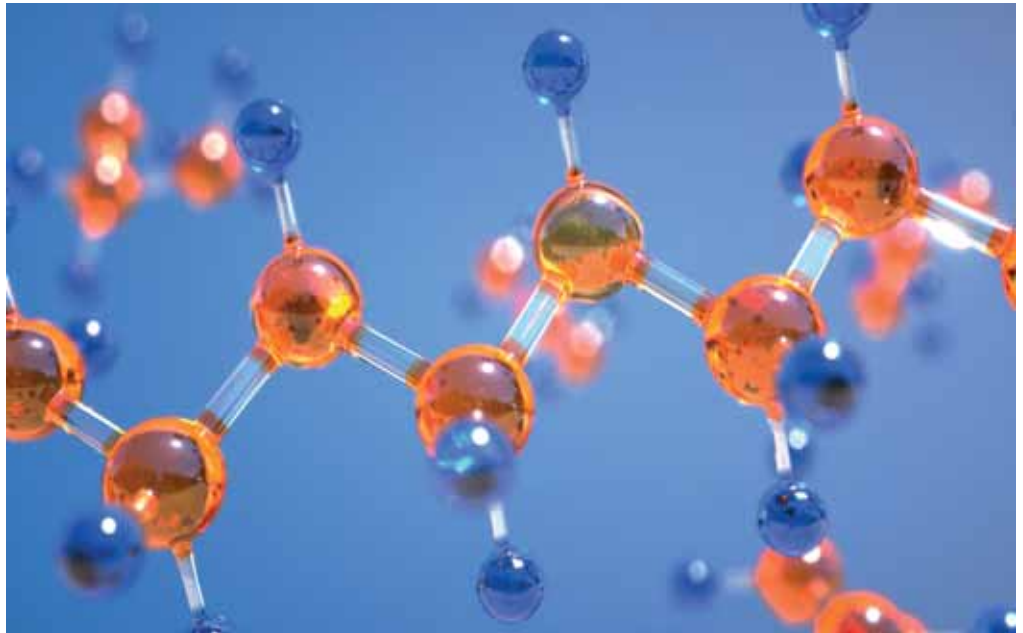
Backed by many customers, Oemeta UK offers benchmarking as the ideal solution to help find the right cutting fluid with no financial implications.

The benchmarking service is an opportunity to have your cutting fluids

new products, services, concepts and relationships.

In the UK, it focusses on adding value to its specialist products through tailor-made solutions, which include servicing and equipment and helping customers to gain the best results from products.

Oemeta UK believes that a company is



analysed, improvements/KPIs discussed and followed up with a proposed solution. Oemeta collects samples from your operational machines, which are then analysed by experienced lab technicians using industry standard tests. Based on the data-driven results and considering health and safety, cost reduction, reporting, waste management and Oemeta's continuous improvement programme, the company offers a comprehensive solution that will meet your needs and remove any costly guesswork on a suitable fluid. This process takes into account your work objectives/schedules and experienced technicians are on hand every step of the way.

Oemeta UK was originally established in 1993 to bring German-engineered machining coolants to the UK and Irish markets. The company was reincorporated in 1997 and became Oemeta (UK) Ltd. At its core are water-miscible coolants and multifunctional oils.

The company is a committed technology leader and continuously looks to develop

only as good as its people. Its employees are friendly and approachable and have many years of experience within the wide field of coolants and lubrication. The company goes out of its way to ensure that customers get the best possible product for applications. In addition, it ensures that the level of service provided maximises commercial, H&S and technical requirements.

The industry sectors that Oemeta covers include automotive, aerospace, industrial engines, motor racing, precision engineering, defence, and glass manufacturing, to name a few. Wherever machining coolants and oils are needed, it can help.

Oemeta UK
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www.oemeta.co.uk

No compromise coolant for the toughest of applications

TRIM® E923 cutting and grinding fluid started life as a bespoke development for a manufacturer serving the oil and gas industry, both for the general machining and deep hole drilling of tough, corrosion resistant alloys used in the manufacture of subsea wellhead equipment. Now, this unique product can provide the same exceptional performance to industry at large, thanks to its inclusion in Master Fluid Solutions' standard range.

A proprietary blend of new vegetable-based technology and very high levels of chlorine free extreme pressure additives, TRIM E923 is robust enough to deliver unparalleled tool life in some of the most difficult metal cutting operations. It achieves this while still providing the excellent non-cutting characteristics expected from Master Fluid Solutions' traditional high-quality emulsions.

Peter Blenkinsop, director of sales (Europe) at Master Fluid Solutions, says: "Our original brief for the development of this product came as a result of the customer investing in latest generation

machining centres that, in the same setup, could drill deep holes up to 1 m in depth with a diameter of 25 mm and undertake standard machining."

He continues: "A lot of R&D time went into creating a formulation that could provide the necessary tool protection. Guide pads keep the drill in place but without exceptional lubrication, they wear out quickly resulting in very costly tool change."

TRIM E923 has since been used by another company for drilling 2 m holes of 10 mm diameter in steel so it has clearly proved itself an ideal replacement for neat oil for the toughest of applications. The optimised lubricity and EP package matches heavy duty neat oils on difficult-to-machine materials such as Inconel, titanium, stainless steel and high tensile strength steels.

Although coolant additives are commercially available to boost standard coolant performance, TRIM E923 is largely in a class of its own as a complete coolant package for harsh applications. It has a very long sump life and will run effectively for



long periods without the need for costly additives. Also, as a latest generation Master Fluid Solutions' product, TRIM E923 is also boron and formaldehyde free and easily recyclable or disposed of without special handling or equipment.

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BIG-PLUS dual-contact spindles now licensed to almost 170 tool manufacturers

As a global leader in premium high-precision tooling systems, BIG KAISER has announced that, in addition to an already extensive list of licensed machine manufacturers, eight more have recently become licensed to utilise the BIG-PLUS spindle and tooling systems on their machine tools.

The BIG-PLUS solution, available from ITC, is unique and provides substantial advantages over competing industry spindle designs. It is the only system that provides simultaneous taper and flange contact in a 7/24 cone interface. This dual-contact connection between the machine and the tool makes it exceptionally robust, reliable and accurate.

There are now nearly 170 manufacturers licensed to implement the BIG-PLUS spindle on their machinery. Despite the fact that BIG-PLUS was developed over 25 years ago in Japan, the adoption of BIG-PLUS spindles is steadily seeing, solid growth across the industry.

Christian Spicher, head of sales and marketing at BIG KAISER, says: "Many manufacturers will already have BIG-PLUS compatible machines and many of their spindles may actually be BIG-PLUS compliant, but they may not be aware of this important fact. This means that machine tool users are missing out on the substantial benefits provided by this rigid dual-contact interface."

For customers who are unsure whether they have a BIG-PLUS spindle, the easiest way to check compliance is to place a standard tool into the spindle and see how large the gap between the toolholder flange face and spindle face is. On machines without the BIG-PLUS system, the standard gap for DV50 should be clearly visible at

approximately 3.2 mm. With a BIG-PLUS DV50 spindle, the gap is approximately half the size. Naturally, gap sizes vary accordingly for DV40 and DV30 configurations. Nevertheless, with BIG-PLUS the gap is always visibly smaller compared to alternative spindle interfaces. Alternatively, manufacturers can ask their local ITC representative to confirm compatibility.

While competitors offer 'dual-contact toolholders' that claim to provide a similar flange and taper contact solution to BIG-PLUS, these holders are not typically made to sufficiently tight tolerances and may not provide a sufficiently rigid contact interface. Using unlicensed toolholders unnecessarily risks a less robust connection as well as expensive spindle damage, potentially voiding the machine's warranty.

To help its customers, BIG KAISER has developed a simple test that can easily determine whether a toolholder is in fact a genuine BIG-PLUS spindle or an unlicensed dual-contact toolholder.

If a BIG-PLUS spindle is used with standard V-flange tools, over time this will result in wear on the spindle and alter its geometry. Since a rigid simultaneous taper and face contact is required, geometry is a critical factor and even minor deviations will impair the BIG-PLUS spindle ability to deliver its full potential.

To address this issue, ITC can now offer customers special spindle and tool taper cleaners, as well as arm alignment tools. However, to restore a BIG-PLUS spindle to its proper specifications, the most effective option is a certified regrind. The BIG-PLUS system was invented by BIG KAISER's parent company, BIG Daishowa in 1993. Its time-proven superior vibration damping and



rigidity noticeably improve machining accuracy and repeatability. This facilitates heavy duty and high-speed cutting while also providing a longer tool life. For example, when compared with a conventional BT holder in shoulder milling tests, the BIG-PLUS system reduced the deflection of a machine part by 30 percent.

The BIG-PLUS solution ensures that as the tool enters the machine spindle, the taper makes the initial contact. Due to the pull-in force, the tool taper expands the spindle in the elastic range of the steel. The tool is then pulled further into the spindle until the tool flange reaches the surface of the spindle nose. These toolholders are firmly held to a fixed relationship between the gauge line and the face with a tolerance of only a few microns. With such a tight tolerance, BIG KAISER can be sure that any BIG-PLUS tool put into any BIG-PLUS spindle will have the proper taper and face contact. Having the same dimensions as conventional BT or SK holders; BIG-PLUS is fully interchangeable with existing accessories.

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Hoffmann celebrates its centenary



The Hoffmann Group is celebrating the centenary of its founding. The company has made its name by providing quality tools.

Hoffmann began its centenary year in great form. In 2018, Hoffmann SE and its subsidiaries achieved record sales, topping one billion euros for the first time. The company's workforce has reached a record level of over 3,000 people and the business continues to grow organically. "The fact that our business is doing so well today is thanks primarily to our highly committed staff" says Nicola Bleicher, great-granddaughter of the company founder and a shareholder in Hoffmann SE. Her sister and co-shareholder Verena Heinrich adds: "Our employees are the fountain of youth for our hundred-year-old company. Their vision, creativity and entrepreneurial spirit enable it to adapt flexibly to changing times."

The foundations of Hoffmann SE were laid by Josef Hoffmann on March 11th, 1919 in Munich. His son Franz joined the business in 1932. He created the Hoffmann catalogue in 1936, which nowadays is issued in 18 languages and is also available in the form of an online e-shop at www.hoffmann-group.com. Starting in the 1950s, Franz Hoffmann aligned the business firmly

towards the selling of quality tools supported by high-level expert advice. He was also responsible for launching the company's own product lines under the GARANT brand name back in 1973. As the long-standing head of the company, he moulded and embodied its culture and values more than anyone else.

Siegfried Neher, executive board member and director of technology and transformation at Hoffmann SE, comments: "We are still today putting into practice the values by which the company first gained its success, now formulated by the slogan 'Pioneering, Precise, Personal'. This approach incorporates a strong sense of quality awareness, as well as adherence to the three key criteria of keeping things simple, focused and useful as well as a firm commitment to continuous improvement and long-term planning. Our system of values is the compass which guides us and keeps us on course."

The third generation of Hoffmann then merged the company with the Gödde, Oltrogge and Perschmann family businesses to form the Hoffmann Group, today a leader in Europe for quality tools. Now headed by the fourth generation, the Hoffmann Group with its partners has 69 subsidiaries in more than 50 countries all around the world.

A key legacy of Franz Hoffmann is the commitment to getting ever better. It is the driving force behind the innovative strength of the company. Nicola Bleicher says: "We are investing massively in the future, in order to drive innovation. At present, our focus is



on the development of digital products and services. Also, we are undertaking the largest project in the company's history with LogisticCity."

LogisticCity is currently under construction on a 21.5 hectare site in Nuremberg and will become the company's global distribution centre. Some 900 people in total will be employed at the new facility. "We are sure that we are well set for the next hundred years," Verena Heinrich concludes.

The Hoffmann Group is a leading system partner for quality tools, combining trading with manufacturing and service expertise. This combination provides the company's 135,000 plus customers with certainty of supply, assured quality and enhanced productivity in meeting all their needs for tooling, as well as workstations, storage and Personal Protective Equipment (PPE). Optimum and reliable advice, from individual needs analysis to efficient product application, is always guaranteed. In addition to machining, clamping, measuring, grinding and cutting tools, the portfolio also comprises hand tools, occupational safety equipment, workstations and storage and workshop articles.

Customers include large stock market listed corporations as well as small and medium-sized enterprises in more than 50 countries. The Hoffmann Group offers 80,000 quality tools from the top global manufacturers, including its own in-house GARANT premium brand. With comprehensive service backup in all regions and offering a TÜV-certified delivery quality rating of over 99 percent, the Munich-based tooling specialist is a reliable and efficient partner for its customers.

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Walter cuts a fine path

Walter AG, one of the world's leading metalworking companies, has reinforced its status by announcing a flurry of developments in milling cutter technology, all designed to generate a raft of cost-savings and improved process integrity benefits for users across all industry sectors.

Of particular appeal to automotive OEMs and top tier suppliers, Walter's new PCD cutter uses a variety of standard inserts in a single tool that is able to rough up to 8 mm deep, finish, 0.5 to 0.8 mm, mill aluminium and finish mill bi-metal workpieces. The cutter therefore reduces tooling costs by obviating the need for multiple tools for varying operations on different workpiece types.

While around 70 percent of modern engine blocks are of aluminium, bi-metal blocks usually have components like cylinder liners of grey cast iron inserted into the aluminium body. The machining process, especially roughing and finish milling of such workpieces, was previously only possible using a range of different tools, therefore hoisting tool costs as well as increasing the time and cost spent on tool logistics and tool changes.

Aluminium alloys can be rough and finish machined extremely easily at high feed rates. However, process reliability and surface quality are influenced by chip removal and the formation of cavities. Added to this are the numerous cavities found on engine blocks, such as drilled holes, bushes and recesses. Of course, cleaning routines, an additional process step, adds to overall production costs and does not guarantee that all chips can be removed.

Walter's answer has been to design the new cutter with a coolant channel running through the centre of the tool, ensuring that the flow of coolant removes any chips.

An additional factor is the cavities that



form during casting, which are 'ripped open' during milling and, if untreated, can result in leaks. Again, an additional milling operation is traditionally required to create a homogeneous finish where the porous surface is 'filled in'. The new cutter overcomes this problem by being able to perform both finish and lubricated milling.

Designed specifically for universal roughing of a variety of materials, the MC319 and MC320 Advance solid carbide milling cutters feature an innovative castellated profile for even longer tool life. Together with the MC320 Advance and MC320 ConeFit, users have three to eight cutting edges, depending on tool diameter, and an edge cutting to centre.

Cutting power requirement, spindle output, during machining is around 30 percent lower than comparable tools

with smooth cutting edges. The new cutters also enable full slotting of up to twice the diameter with very short chips, a high metal removal rate and a particularly smooth milling process.

The M4000 universal milling system is now available in diameters of up to 315 mm, compared to the usual 160 mm and, with four cutting edges per insert, the universal inserts reduce inventory costs considerably. The design consists of a basic body plus with four adjustable and interchangeable cartridge types carrying Tiger-tec Silver and Tiger-tec Gold inserts.

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Latest boring cutters offer up to four operations in a single tool

CoroBore BC from Sandvik Coromant is easier to order and less expensive than engineered tools

Cutting tool and tooling system specialist Sandvik Coromant is introducing its CoroBore® BC (Boring Combination) range of solutions, which comprises tailor-made tools for high-volume applications. Using CoroBore BC, it is possible to perform different operations such as semi-finishing and chamfering with a single tool. Manufacturers set to benefit include those serving the automotive, general engineering and construction equipment sectors.

CoroBore BC offers a quick and easy alternative when standard tools do not match up to specific requirements, but the cost and delivery time of a specially engineered solution are prohibitive. The process is fast as Sandvik Coromant personnel utilise an online program that automatically creates the tool and provides price and delivery information.

Thanks to the various CoroBore BC options offered, a wide range of multi-step boring applications can be performed. Indeed, customers can choose from up to

four machining operations in a single tool, a maximum of two cutting edges per operation. Cutting diameters range from 20 to 200 mm, 0.787 to 7.874 inches, while tool length can be up to 400 mm, 15.75 inch, depending on the coupling size. Coupling options include Coromant Capto®, HSK Form A and ISO 9766, as well as ISO/Mas-BT/Cat-V tapers. The wide range of supported coupling models and sizes usually enables direct integration with the machine interface, thus eliminating the need to use a separate basic holder.

CoroBore BC insert-carrier solutions use CoroBore cartridges. Compared with fixed insert pockets, this configuration enables easy and efficient cartridge changes. As standard stocked items, both the insert and insert carrier are easily replaceable at short notice.

The cartridges come in three configurations: radially and axially adjustable; axially adjustable only; non-adjustable. All cartridge options are equipped with high-precision coolant nozzles capable of using coolant pressures up to 80 bar, 1,160 PSI, a unique benefit in



tailored multi-step boring tools. Ultimately, the unique benefits of CoroBore BC present machine shops with an option to receive a tool in a reduced lead-time in comparison with an engineered tool and at a more attractive price point.

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TaeguTec introduces shooting star

The impressive StarMill SED range of end mills from TaeguTec has now been expanded to offer a greater choice of diameters, lengths, radii, coatings and geometries to suit the ever-changing demands of the marketplace.

Already a star performer on difficult to cut materials such as stainless steel, titanium, inconel and other high temperature alloys, the StarMill has been extended with the arrival of the SED4 UL range of 4-flute extra reach end mills. The new UL extension introduces end mills with 3, 4, 6, 8, 10 and 12 mm diameter with an overall reach from 63 to 92 mm depending upon the chosen diameter. With a flute length from 10 to 40 mm, this addition to the SED line-up enables manufacturers to reach deep into small cavities and difficult to reach surfaces.

In addition to the SED4 UL line, TaeguTec has also introduced a complete line of SED4 UR end mills with a corner radius for enhanced tool life and machining performance. The new SED4 UL range is available in diameters from 2 to 16 mm with each diameter offering the customer a

selection of corner radii. While the 4 mm diameter tool offers users the choice of a 0.1, 0.2 or 0.5 mm radius, the largest 16 mm end mill is available with a 0.5, 1, 2- and 3 mm corner radius.

All ranges within the SED StarMill portfolio incorporate unequal flute spacing and a high-helix that combine to reduce harmonic effects and vibration during high-speed machining. Furthermore, the polished high-helix flutes improve chip evacuation while the dynamic new TT5515 grade coating prolongs tool life under the most challenging of machining parameters.

TaeguTec is a globally recognised supplier. It supplies high quality products to a network of subsidiaries and distributors in more than 40 major industrialised countries. Each TaeguTec office is equipped with the latest technology and a team of dedicated staff to discuss customer support, engineering and product development needs. This is supported by the company's warehouse and logistic facilities.

A 24-hour delivery system in Europe functions from its central warehouse in



Belgium. Employees are trained to provide technical seminars to support clients and distributors in each local market. This is supported by annual customer technical seminars and conferences at TaeguTec's advanced manufacturing facility and R&D headquarters in Korea.

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Fastener manufacturers improve drivability with unique coatings

Specialty coatings can provide fastener manufacturers with new products and a competitive edge

Since cordless tool battery life is a serious concern for pros and DIYs, a growing number of fastener manufacturers are addressing the issue with unique coatings that dramatically increases the drivability of nails and screws.

This, in turn, minimises the amount of power used by cordless tools, extends the battery life and increases productivity since fasteners can be fixed faster and in higher volume before the battery must be changed out or recharged.

Drivability can also impact gas-actuated fastening systems that utilise fuel cells, coupled with batteries, to drive framing nails, finishing brads or screws without having to connect to an air compressor or power cord.

The fuel cells, which can cost as much as \$15 at big box stores depending on the brand, are typically advertised as being able to driving 1,200 nails. By improving drivability of framing nails, a more economical and efficient 2,000 nails could be achieved per fuel cell, for example.

According to Dan Chin, president of Universal Chemicals & Coatings (Unichem), this was the specific goal of one fastener manufacturer that sought his company's help in creating a specialty coating that would dramatically improve the drivability of nails.

Unichem is a custom coating and adhesives formulator that has worked with fastener manufacturers on these types of issues. The manufacturer's goal, says Dan Chin, was to be able to market the gas-actuated framing nail gun's ability to drive a higher number of nails per fuel cell to differentiate it from the competition.



He explains: "The goal was to improve what the company called 'ease of drive' by 25 percent, which is a huge number. In doing so, more framing nails could be driven flush with one fuel cell."

To shoot a nail, fuel cell-powered nail guns inject a small amount of fuel along with compressed air into a chamber. A battery supplied spark then causes a tiny explosion, which drives home the nail.

Manufacturers of cordless framing and finishing guns often market unit-specific nails or screws. These consumables generate significant ongoing revenue. Given the competition in the market, offering a product with a promotable differentiator is even more critical.

The challenge facing Unichem was to create a custom coating for the nails that improved drivability without allowing it to be easily removed.

Dan Chin continues: "You can create a coating that increases the lubricity or 'slipperiness' of the nail so it goes in easily, but then it must act like an adhesive once in so it cannot be easily taken out."

Unichem's chemists successfully figured out a coating formulation that improved nail drivability by 25 percent and meets the required anti-withdrawal properties.

Dan Chin says: "The specialty coating allowed the

customer to re-launch the product and market it as incorporating new improved technology. They were able to increase their revenue and were very successful with it."

The coating also potentially increases the number of nails that could be driven on a single, full battery charge, a high priority for cordless tool manufacturers and users.

Whether a pro wields a framing nailer at a construction site or a DIYer uses a finish nailer to install mouldings or baseboard, no one wants to interrupt the job to change out, or recharge, a dead battery. The same is true for anyone using a cordless screwdriver, drill driver, or impact driver.

To address this issue, various strategies have been employed to extend battery life. Some include moving to more powerful, longer-lasting lithium batteries along with techniques to avoid overcharging.

In conclusion, Dan Chin suggests forward thinking fastener manufacturers should consider custom coatings that help to speed jobs and maximise cordless power tool life in the field.

"In a competitive market like fasteners, coatings can be used to create innovative new products with a clear-cut differentiation from the competition."

Unichem

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www.unicheminc.com



Textile bonding is the fabric of success

As seen at the JEC Exhibition in Paris and to be showcased at The FAST Exhibition in Silverstone next month, Lohmann's DuploTEC bonding tapes are helping sailors to go further, faster and more cost-efficiently. That is all thanks to the latest advances in adhesive crosslinking technology for fabrics developed at the company's extensive R&D headquarters in Neuwied, Germany.

The evolution of modern textiles has accelerated, with increased rapidity over the last 30 years or so. As new materials have emerged, so has a substantial number of new fabrics that are made from them. Some industry observers say developments have now reached a point that many believed, only a generation ago, it would be impossible to achieve. The breakthroughs are impressive: ballistic vests that weigh no more than an ordinary dinner jacket yet can stop a high-velocity bullet; yachts propelled ever faster by lighter, stronger, tear-proof sails and new-generation parachutes that can save a light aircraft from crashing, if the unimaginable should happen. These are just three examples of where new textiles have found a welcome home, but there are many, many more. In fact, such products have now become commonplace, courtesy of advances in materials technology being embraced by fabric manufacturers.

Yet few users of such things ever pause to dwell on the technology behind the fabrics concerned or how they are made and put together. For manufacturers of sails, made with multiple panels of advanced fabrics, the quest for flexibility, durability, lightness, UV resistance and outright strength has had to be matched by innovations in production technology and techniques too. There isn't, after all, much point in having an all-new wonder fabric available, if it cannot be commercialised through good design and affordable production in the required volumes.

The joining of these new fabrics has itself presented a variety of challenges in order to meet design and production briefs. A fresh approach to this joining element has become a subject of much importance in the race-to-market for manufacturers across many sectors. As new fabrics have found new applications, particularly in the automotive, aerospace, medical, sports equipment and agricultural industries, one



supplier of bonding technology has emerged as a leader in the field. Through its existing customer contacts, Milton Keynes-based Lohmann Technologies has been closely associated with the development of the latest generation of new technical fabrics. The company, through its application engineers, as well as R&D staff, has proved itself capable of delivering new, ground-breaking adhesive and tape solutions that have allowed these advanced technical fabric manufacturers to permanently join sections, panels and seams together in ways that were previously not possible using bonding technology.

The advantages of bonding with tape, to both the manufacturers that are embracing these new methods and the customers who end up using them, are proving important. Where sewing and ultrasonic welding may have been the only previously viable joining options for many fabrics, manufacturers now have a third way to consider for use on the production floor. One that is quicker, cleaner, light, effective and strong, as well more cost-efficient. DuploTEC adhesive tapes are proving to be a game-changer in the joining of advanced fabrics and their use in the production of sails for yachts is just one example.

In the cost-efficiency equation, it isn't just the ability to help achieve better designs that has been behind the increasing use of DuploTEC structural bonding films. Another



key driver is that, as the adhesive tape can be delivered to the customer as a precision die-cut to a tolerance of ± 0.05 mm in some materials, it means that the fabric manufacturer can achieve the closest possible fit on the production line, repeatedly, irrespective of whether one die-cut or a thousand are used on a particular piece. This not only guarantees strength with repeatability, in most cases, compared to ultrasonic welding or stitching, it also means that assembly processes are greatly simplified and also greatly speeded up, meaning clear cost-reduction advantages are achievable. Moreover, with no capital equipment required in the first place, the bottom-line numbers for a fabric manufacturer using DuploTEC bonding tapes can change for the better.

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Manual indexing head saves programming and setup times

Ideal for production shops where manual mills may still be in operation, but equally well suited to use on a CNC vertical machining centre (VMC), a new, manually adjustable indexing head has been introduced by 1st Machine Tool Accessories. The RotaVice can be rapidly set to position a component at a multiplicity of rotary angles in the horizontal plane for milling and drilling.

Produced in the UK, the unit is designed to be secured in a One-Lok workholding device manufactured by Chick in the US, for which 1st MTA is the sole agent in the UK and Ireland.

Expensive fixtures and the need to change machine setups can be avoided, saving money and time. In smaller job shops employing 4-axis VMCs equipped with a full or indexing rotary table, where there may be only one or two people able to program the machine, the load can be lightened by having an operator of a lower skill level set up a component manually for 3-axis machining.

Everything about the RotaVice is fast. Firstly, a One-Lok may be bolted quickly onto a VMC table. Next, positioning the moveable jaw using the built-in, time saving ratchet mechanism leaves only a few turns of the handle to clamp the indexing head in a special RotaVice jaw, also made by 1st MTA, which replaces the standard One-Lok jaw. Lastly, the workpiece is secured in moments in a horizontal orientation using an array of workholding options, which include a 3-jaw chuck.

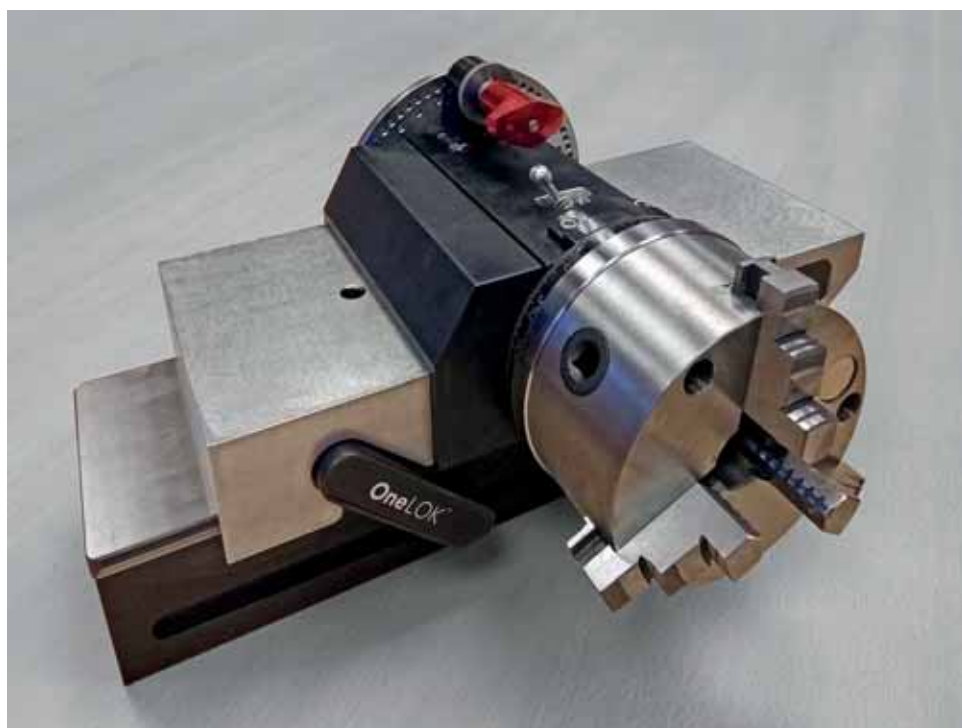
Adjusting the angle is also rapid and accurate. It is effected by turning a circular locating plate to the required angle and inserting a pin into the relevant hole, an array of which are pre-drilled into the plate at the most common angles. In the standard configuration, 5, 10 and 45 degrees are available. The standard plate can be changed for a specific plate to suit any job that involves the use of non-standard angles.

Another advantage of the RotaVice is that once the angle has been selected, it uses the clamping force of the One-Lok to secure the rotary angle. This force, which is much

higher than that offered by standard dividing heads, allows significantly heavier machining cuts to be taken and delivers improved surface finish.

Altering the angle for a subsequent machining operation on the same component is similarly achieved without

the hassle of searching for the best items from the finest manufacturers by only stocking high quality products. Through careful reviewing of its business partners and suppliers, it maintains a high level of quality and provides customers with peace of mind and excellent service.



having to re-clamp the part, thereby avoiding loss of accuracy through tolerance build-up. Intermediate angles can be set using a rotary dial with a one-degree increment scale, while very fine adjustments down to ± 0.5 degree can be made using the toggle lever mounted at the top of the unit.

Importantly, RotaVice has a large through bore with a taper and an internal thread, both of which can be configured for use with chucks, mandrels, special fixtures and backstops. These are normally not associated with standard dividing head systems.

RotaVice is available from 1st MTA to existing users and new users of Chick One-Loks in Britain and Ireland. The system can also be exported to manufacturers worldwide that use similar equipment.

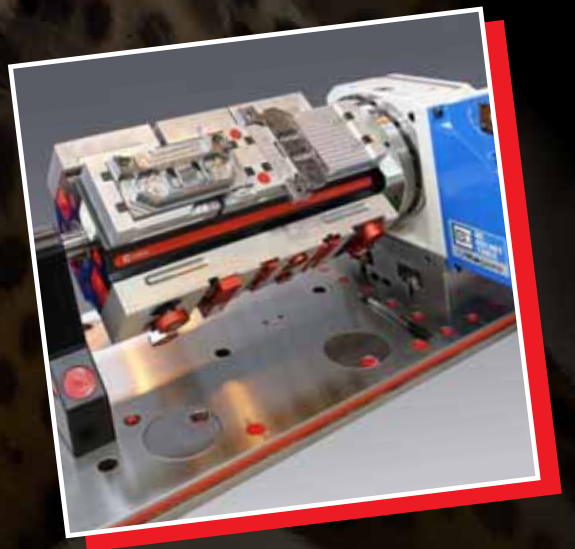
1st Machine Tool Accessories takes away

The company stocks a vast range of machine tool accessories, from clamping equipment such as chucks, chuck jaws and machine vices, to smaller but equally important items such as drill sharpeners. In addition, it stocks the larger items that go hand in hand with production machining processes, including rotary tables suited for all manner of application and the widest range of bar feeders on the market.

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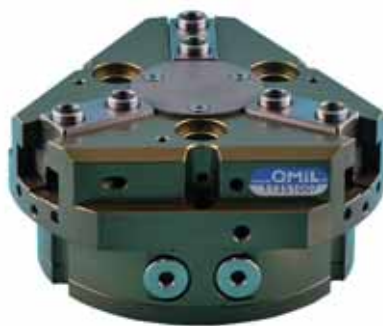
'Gripping' new solutions from Leader

The extensive OMIL range of gripping systems offers new and enhanced products specifically developed and selected to improve the efficiency, productivity and accuracy in a number of key sectors, including machine tools, assembly machines, transfer machines, gantry-robots and in the general mechanical and electromechanical engineering industry sectors, as well as 'bespoke' special machining solutions. The range is now available from Leader Chuck International, one of the UK and Ireland's premier workholding and manufacturing ancillary specialists.

As managing director Mark Jones, explains: "There is a strong case for automation to be applied wherever possible across all industry sectors, with all the well-documented benefits it brings, such as lower overheads, increased efficiency and productivity. To support our customers on their journey towards business improvements, we selected OMIL as a trusted partner with extensive knowledge and experience in this crucial area, plus the flexibility to develop the precise solution to any challenges presented."

With an impressive facility in Turin, Italy and over half a century of experience producing gripping systems, OMIL has a comprehensive range of standard products that are robust, reliable and are usually available on very short lead times at very competitive prices. The range includes grippers, linear and rotary actuators, vices, chucks and bespoke solutions.

Main application areas include robotics, assembly lines, milling machines and special machinery. End effectors for industrial robots can grip parts weighing up to 500 kg and up to 1,000°C for die casting and



forging, while applications for grippers used on automated assembly lines include automotive, pharmaceutical, electronics, food & beverage, domestic appliance and packaging.

The range of pneumatic grips offered is as diverse as the industrial applications supported, from two-finger parallel to three- or four-finger self-centring and two-finger radial. As an example of the exceptional level of engineering applied to its products, the OMIL GSO range of two-finger parallel grippers is manufactured to ensure protection to class IP67 for harsh environments. An oval cylinder is used for higher gripping forces, between 123 N for the smallest unit with 5 mm stroke and 1,640 N for the largest with a stroke of 32 mm. A mechanical gripping force maintenance device ensures a minimum gripping force even if the air pressure drops.

For applications where larger and heavier workpieces require gripping, OMIL has a number of ranges that provides strokes up to 400 mm and gripping forces of 10,000 N at normal workshop pressure of six bar.

For milling machine applications, a range of chucks for round parts and vices for prismatic parts are available, while special machinery applications can encompass

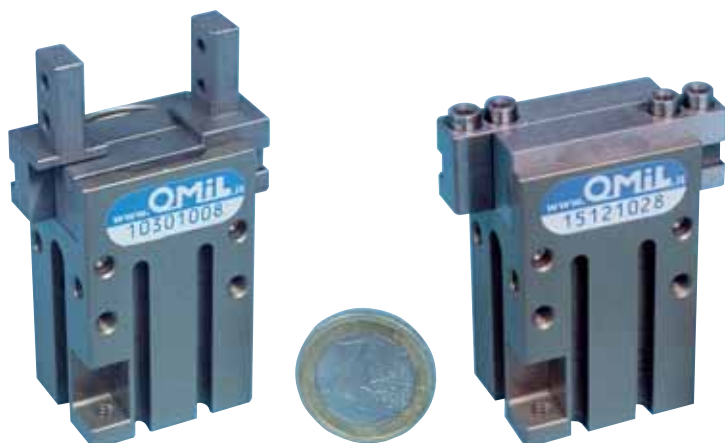


punching and forming equipment as well as measurement and inspection systems.

Mark Jones concludes: "Any company looking at specifying a new automation system or upgrading an existing installation should look at OMIL as a viable alternative to the Japanese, SMC and German, Schunk and Zimmer, suppliers. Not only do they offer the same performance at considerable cost advantage and complete interchangeability, but also the benefit of flexibility, allowing solutions to be customised to exactly suit each application."

Based in Tamworth and Co. Dublin, Leader Chuck Systems has an enviable reputation for the in-house design and production of Leader chucking, stationary clamping, gripping and workholding products. A respected brand name for high quality equipment, with more than 65 years' experience, the company also stocks products from the very best suppliers. Able to provide the right chuck or gripping solution for any application, Leader Chuck offers quality and precision.

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Autonomous gripping

The gripping industry is undergoing radical changes. In the past, gripping processes were primarily geared toward boosting productivity and process reliability. With the advent of smart factories, flexibility is becoming an increasingly important factor. According to SCHUNK'S vision, tomorrow's grippers will enable flexible operations and even autonomous handling scenarios

Until recently, industrial gripping has been relatively rigid. The geometry of the parts must be known, as well as the exact pick and place position. A reliable handling process can be ensured by predefining traverse paths and specifying target point coordinates based on repeatable parts feeding operations. With the rise of digitalisation, the trend is now moving towards highly automated, fully networked and autonomous manufacturing systems.

Artificial Intelligence

Against this backdrop, artificial intelligence (AI) is becoming increasingly important. The first cognitive intelligence applications for grippers in combination with cameras are

already possible. This allows for intuitive training by the operator and autonomous handling of gripping tasks by the robot. For these applications, SCHUNK deliberately designs practical, industry-oriented handling processes by limiting the number of component variations. This streamlines the classification and training process. In an initial use case that makes use of machine learning approaches for workpiece and gripping process classification, interlocking building blocks are randomly combined and presented to a lightweight robot in a random arrangement on a work surface. The robot's task is to pick up and transport the blocks. By interacting with 2D or 3D cameras, the self-learning system rapidly increases gripping reliability after only a few learning cycles. With each grip, the gripper learns how to successfully pick up and transport the workpiece.

Effective learning through continuous optimisation

After only a few training sessions, the network classifies how to handle the range



of workpieces and the resulting combination options. The gripper knows how to pick up and transport the workpiece based on learned experience. Due to the intelligence of the algorithm, the gripper can classify future combinations and arrangements of workpieces on its own after only a short period of training. In this way, the system is capable to handle parts autonomously and with sensitivity to the situation. The algorithms are continuously adapted using AI methods. This makes it possible to reveal previously unrecognised correlations and further refine the handling process.

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New magnetic clamping balls from norelem enable easy workholding

Manufacturers, design engineers and machinists can now freely position and hold workpieces on large surfaces thanks to norelem's new magnetic clamping balls.

Quick and flexible holding of components is essential in tool and die making. Toolmakers must be able to laser weld, polish, assemble and adjust parts so that they fit together properly, with maximum flexibility and efficiency. With norelem's magnetic clamping balls, rapid clamping and releasing is now possible.

Available in four different sizes with magnetic faces of 80 mm to 160 mm diameters, the workpieces are clamped through a permanent magnet. The magnet has a nominal magnetic force of up to 100 N/cm², which can be switched on and off using a hexagonal key. When the key is rotated 120°, the magnet's force is fully realised while partial clamping force is also possible so that parts can be easily positioned.

Marcus Schneck, CEO of norelem, says:

"Efficiency and increased productivity are the name of the game in engineering and with our new range of magnetic clamping balls, engineers can speed up their processes when machining and tooling.

"Using a simple turn of a key, workpieces can be adjusted quickly, providing an unobstructed surface for the engineering task at hand."

The magnetic clamping balls can swivel up to 90°, depending on the workpiece geometry and weight. To ensure a high-quality finish, the magnetic face has a fine 1.5 mm poling and is mounted in an anodised aluminium globe. The globe is held in position by a stick/glide effect and lays in a leather lined, chemically nickel-plated steel ring.

norelem is a leading manufacturer and supplier of flexible standard parts and components for mechanical engineering. The company supplies 43,000 standard products relating to standard machinery and operating elements, as well as automation



components. 98 percent of these parts are available from stock and the business delivers on-site technical support for products. This high level of inventory enables norelem to provide fast and reliable delivery times, with orders placed before 3 pm being dispatched on the same day.

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Removing dust to ensure the perfect finish

by Paul Riddick, co-founder and technical director at dust and fume extraction specialist Vortex

Dust can be defined as a fine, dry powder which is made up of tiny particles of earth or waste matter. It can be found on surfaces or it can be airborne. The first thing you need to know is what these particles are and how they're getting there. Needless to say, if you have a process such as machining wood, you can expect the particles in the workplace to include wood dust. But are there other particles as well, such as chemical powders, or biological dusts caused by skin or hair? Today's quality extraction systems are extremely effective, but it depends on identifying what's in the dust, where it comes from, how it behaves and exactly which system you can use to beat it.

Is your dust supplied or generated?

The dust extraction industry uses two categories to identify the source of dust ingredients. The first is supplied dust. What that means is that an application, such as weighing a powdered product or sampling a powder-based ingredient, has caused the particles to become airborne dust. The second category is process-generated dust, for example, particles that are created by grinding, crushing, cutting and other industrial processes. This dust can include powders and fibres.

How dust enters your body

As far as human workers are concerned, the size of the dust particles is key to the way in

which they can enter the body. For comparison purposes, bear in mind that a human hair measures around 100 microns and that our eyes can't detect any particle smaller than 30 microns. Particles over 100 microns are too large to be breathed in, they fall to the floor or collect on surfaces.

When we talk about inhalable dust, we're referring to a dust cloud that is partly visible in which the particles are between 10 and 100 microns. This type of dust is easily inhaled as it can be breathed into your mouth, nose and throat. All of these have soft tissue and the dust can, at best, cause irritation and, at worst, cause severe and lasting damage. However, the particles are usually too large to enter the lungs.

Respirable dusts are smaller; the particles are typically 10 microns or less, so we can't see them and they are small enough to enter the lungs. Once in the lung, they get lodged in the small vessels that carry air: the alveoli and bronchioles. Not good news because dust particles this deep in the lung can cause breathing difficulties, lung diseases and even cancer.



A process that creates a lot of dust may also impair the operator's vision, resulting in inaccurate workmanship and potential risk to handling in very dusty conditions. As if this wasn't enough, many dusts can be potentially explosive. It's therefore an essential part of an employer's duty to get the dust out of the air and ensure that workers are properly protected from the wide range of hazards it can bring.

What makes up a dust cloud?

A dust cloud that you can see will often contain both types of particles; those that can be inhaled and those that are respirable, able to enter the lung. Wood dust is mainly inhalable whereas something like a chemical dust will be largely respirable.

You need to assess what's producing dust in your workplace, bearing in mind that there may be more than one cause. This involves identifying both the source and the process, so it may be metal and grinding, for example. Then you assess the volume of dust and what risks it poses to health. Finally, you will need to look at which workers or work areas could be affected.

You then have several choices: make less dust by changing your processes; change the material to one that doesn't create so much dust; get the operator out of the dusty area; extract the dust from the air so that it's no longer a hazard.



Cloud watching

Modern extraction technology is frequently based on dust control by a Local Exhaust Ventilation (LEV) system. Most of these capture the dust, filter it, and collect it; and the cleaned air is exhausted back out into the work area. They work well, provided that you understand the source of the dust and the process that's creating it.



When you're looking at the source, you also need to understand the dust cloud being produced. How dense is it? How quickly does it move? What's its general shape? You'll have noticed that the cloud is often quite compact near the source but as it moves away, it grows and billows and becomes much more difficult to collect and contain. It also starts to mix with the air and that, in turn, helps it disperse further. So, the hazard may spread to other operators in the workplace who are not involved in the process that is creating the dust. Dust extraction at source prevents this dispersal.

Dust capture

Most extraction systems work by dragging the dust cloud away from the operators' breathing area, so it's essential that you use the right type of hood and that it's positioned correctly. In addition to hoods, there are other configurations such as dust extraction arms. These have a nozzle and can be placed in the airstream of the dust.

The extraction unit usually has filters and includes a filter cleaning system. The filters need to be the correct type for the dust being created and the size of the particles.

Sometimes, the extraction takes place on the tool being used, to stop the dust turning into a cloud. This frequently happens in sanding applications, where the operator is moving about over a large area such as a vehicle bodywork. Alternatively, equipment such as the AirBench is a downdraft bench which pulls the dust particles downwards into a collecting grille, where filters trap it before it can reach the air.

For very dusty and hazardous processes, a dust control booth may be the only answer. The whole environment is purpose-built to capture dust and protect the operator working inside. However, the operator still needs effective protection such as masks specifically designed for the type of dust being generated.

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Effective protection from welding fumes

Welding fumes are considered a serious risk in welding operations. Harmful, ultra-fine particulate matter creates a major health risk to welders. Extraction and filtration systems help to provide effective industrial safety.

Today, innovations in welding technology promise less health risks as a result of the reduced level of welding fumes. This, however, can be misleading. At the nano level, impenetrable to the human eye, the concentration of particulate matter is greater as can be proved by alternative methods. This considerably increases the risk to employees in metal processing facilities. Studies show that welding fume particles are mostly smaller than $0.1\ \mu\text{m}$. Nearly all the welding fume particles are respirable, penetrate deep into the alveolar region of the lungs, alveoli, during inhalation and remain firmly fixed there.



Welders exposed to welding fumes on an ongoing basis run a significant risk of health-related problems. The harmful particulate matter generated during welding of nickel, chromium or cadmium compounds can be even carcinogenic. Additional health risks are associated with filler materials. 95 percent of harmful substances originate from the filler metal and only the remaining five percent comes from the parent metal. What safety measures should be employed to protect metal processing workers from such risks?

When selecting an adequate extraction and filtration system, of crucial importance is



a risk assessment which helps to investigate all the involved risks and working conditions more closely. At the heart of the assessment lies the question what materials and welding procedures are used. The most widely used gas-shielded welding procedures, MIG and MAG, as well as manual arc welding with coated rod electrodes are associated with the highest risk potential. The most hazardous particulates are generated in welding processes involving chrome-nickel steel.

Technical ventilation measures should be used for processes with at least medium hazard class rating, starting from TIG welding of toxic and irritant materials such as manganese or copper oxides. Although using a different filler material can help to mitigate the risk, metal processing workers should always use extraction and filtration systems to eliminate harmful particulate matter from the ambient air, especially that parent materials and welding procedures can change over time.

Direct extraction of welding fumes

Welding fumes should be contained directly at the point of origin. When properly used, indirect capture methods can help to prevent the spread of harmful substances in the ambient air. Low vacuum source extraction systems like ProfiMaster, MaxiFil or MaxiFil Clean are most frequently used in practical terms. They enable capturing harmful substance with the use of extraction hoods and flexible extraction arms at a



distance of ca. 30 cm from the point of origin.

The extraction arms, connected via the extraction and filtration system or the pipe system to the central ventilation system, are self-supported devices. Extraction hoods from KEMPER are designed so that they enable eliminating harmful particles present in the air. This is possible as a result of the flange-shaped cover customised to the welding seam and thus ensuring the particulate reduction efficiency of more than 40 percent compared to oval extraction hoods.



Extraction systems integrated into welding torches and connected directly to the welding gun, like VacuFil 125 or 500 as well as funnel- or slit-shaped high vacuum source extraction systems that are held in place by magnets like MiniFil, offer an alternative to low vacuum source extraction systems. Whenever manual welding is not used, extraction hoods with lateral plates providing protection against crossflows are safety devices of first choice.

Alternatively, industrial safety can be ensured using room ventilation systems in addition to source extraction systems. Additionally, they help to protect non-welders in the production facility from exposure to harmful substances and improve the quality of air in the working area. CleanAirTower helped to launch a new layer ventilation system, such systems are recommended by some institutes compared to mixed-mode ventilation. It is a stand-alone solution that can be installed anywhere in the working area, without the need to connect to the piping system. It is easy to position and extracts air within an area of 360° at a distance of about 10 metres.

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AirBench celebrates 25 years

In September 2018, AirBench Ltd celebrated 25 years in business. Since beginning operations as WorkPoint Environments Ltd, it has supplied in excess of 10,000 dust and fume extraction units to customers across the UK, EU and worldwide. The AirBench name change came into effect in February 2011 and since then the brand has been the Go-To name for downdraught dust and fume extraction.

A family business, AirBench has grown from its beginnings as a small contracting firm, supplying dust extraction equipment from across a range of suppliers, to focus on its own small range of products designed to solve specific problems for industry.

The initial AirBench range of downdraught benches has grown to include a much wider range, including the UK's most advanced downdraught bench, the AirBench RP. It also manufactures a range of cross-draught systems, VertEx and dust control booths, coolant mist filters, OMF and air cleaning systems, MF.

With some staff being with the company since the very early days, it can offer a

continuity of customer service that is exemplary and its network of distributors outside the UK ensures that AirBench products are widely available.

The company can offer on-site demonstrations of its products across the UK, including assessments of dust or fume extraction issues.

Lyndon Design solves sanding dust issue with ducted AirBench

Lyndon Design is a high-end designer and manufacturer of stylish furniture, typically supplying to the hospitality and leisure industries. Established in the early 1980s, Lyndon has grown to establish its own well-known style and design approach with a range of popular lines.

During the manufacturing processes, Lyndon manufactures parts in a range of hardwoods. An existing sanding booth was proving insufficient to cope with the dust generated during manual sanding processes and Lyndon approached AirBench to provide a solution.

Following a full site survey and



demonstration, AirBench recommended a large, HEPA filtered downdraught bench from its FN range, configured to discharge via ducting outside the booth.

Lyndon installed the unit using its own team and the bench has now been operational for several weeks. The workspace is a cleaner, more effective space and the Lyndon team are now happy to work within the booth. Operators have been able to move from canister masks to paper-type P3 masks, meaning comfort and productivity have been greatly improved.

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Dust specialist launches most powerful gas-powered extractor to date

Removing hazardous dust on an industrial scale has been made easier thanks to a leading dust extracting specialist launching its high performance, gas-powered extractor to the market.

Dustcontrol UK's new and innovative propane-driven DC Storm LPG can last up to eight hours and doesn't require any cables, making it ideal for environments with a limited supply of electricity.

The robust machine's 15 kW, 21 hp motor has the capacity to manage dust extraction in conjunction with work involving large scale concrete construction and brickwork projects.

In addition to operating without electricity, the DC Storm LPG is also High (H) class, meaning it offers a higher degree of filtration, with a filter leakage of less than 0.005 percent. Equipped with a HEPA H13 filter, it comfortably exceeds UK minimum standards for silica dust and other harmful properties.

James Miller, managing director of Dustcontrol UK, says: "The DC Storm LPG is our most powerful mobile dust extraction machine to date. It's perfect for large

warehouse, civils and railway environments where electricity is not available or limited. What's more, being run on propane makes it an environmentally friendly option, as opposed to fossil-derived electric.

"It can be used to extract harmful dust created from floor grinders, hammer drills, scarifiers or cutting machines. It can also perform heavy-duty cleaning with a long suction hose."

The compact machine also comes equipped with USB-charging ports, LED lighting and forklift pockets, making it easy to transport.

James Miller concludes: "The DC Storm LPG can also be used in conjunction with any kind of surface preparation, demolition and renovation work. It's effective dust extracting capabilities are very impressive."

Dustcontrol UK, based in Milton Keynes, has over 45 years of experience in developing dust extraction solutions and centralised vacuum systems to fit client requirements in the construction,



manufacturing and engineering industries. The company's expertise is in capturing dust at its source, both where and when it's created.

Its main goals are to help its customers achieve an efficient production process, increase productivity, improve product quality and promote a safe working environment.

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KLINGELNBERG presents forward looking Industry 4.0 solutions at Control 2019

Headlined as "Control 2019 – Networking Science and Actual Practice", the 33rd international trade fair for quality assurance will take place in Stuttgart from May 7 through May 10, 2019. KLINGELNBERG and its portfolio of products and services will be present in Hall 6, booth 6306, where the company will be exhibiting forward-looking Industry 4.0 solutions in measuring technology.

KLINGELNBERG will open its offering with no less than four measuring machines and numerous add-on options. The solutions provider's "exhibition trunk" will include the P 16, P 26, P 40, and P 100 G Precision Measuring Centers, featuring an optimised machine design. In March 2018, the design earned KLINGELNBERG the iF Design Award, which is presented annually by the iF International Forum Design in Hannover, Germany. This year's show highlights include gear measurement for cylindrical gears using the Closed Loop method, the new hybrid technology for tactile and optical measuring technology, and solutions for measurement tasks beyond gear measurement.

P 16 - Precise measurement with Closed Loop technology for cylindrical gears

By extending the Closed Loop concept already established at KLINGELNBERG for bevel gears to the world of cylindrical gears,

the machine manufacturing firm has linked machine tools to the measuring machine in this sector too. Thanks to a wide variety of associated applications and software, KLINGELNBERG has created a central production control system that standardises machining results achieved on different machines, and even in different plants. Closed Loop uses a modern software architecture to allow data to be exchanged between design, production, quality assurance and statistical evaluation, and also actively to bring information to the consumer or, in a later development stage, to initiate process steps automatically. This totally integrated digital data exchange reduces the risks of error and guarantees complete reproducibility of all processes.

P 26 - Hybrid technology combining optical and tactile measuring technology

The standards in gear measuring technology are extremely high, requiring accuracies in the nanometer range on the one hand and short measuring times with a higher information density on the other hand. To meet this challenge, KLINGELNBERG launched a new hybrid technology in 2018 that combines the advantages of both tactile and optical measuring technology. The advantage of rapid sampling by the optical sensor is combined with the flexibility and extremely high accuracy of the



Optical measurement

3D NANOSCAN tactile sensor system. This ensures that the new, highly appealing potential of optical measurement can be utilised without compromising the measuring accuracy. The hybrid system is designed so that the optical sensors can be adapted in a variety of ways.

KLINGELNBERG avoided committing to one sensor principle only. Thanks to a high-speed scanning sensor, any number of axially symmetrical components can be digitised through rapid scanning with an extremely high point density. The "Optical Measurement" option includes the HIGHSPEED OPTOSCAN optical sensor with a rapid change feed unit, the software for sampling and visualising the measured point cloud and the GOM-3D evaluation software.

P 100 G - Measurement tasks beyond gear teeth

The "G variant" KLINGELNBERG precision measuring centres are specifically designed for measurement tasks beyond gears, making them well-suited for measuring axially symmetrical components. The software for standard dimensional



Closed Loop concept for cylindrical gears

measurement tasks and form and position measurements included in the machine's scope of delivery also covers special evaluations such as Fourier analysis. In addition to dimensional measurement tasks, even complex contour and surface measurements can be measured in a single clamping. This is particularly ideal for the high precision requirements in the automotive and commercial vehicle industry, as well as in mechanical engineering and plant engineering. This range will also appeal to all manufacturers of rolling bearings. This is because it enables rolling bearings and rolling bearing elements to be accurately analysed and measured to an extremely high degree of precision. The advantage lies not only in the high-precision form measurement but also in the capability of performing roughness measurements (both internal and external) fully automatically in the integrated measuring runs, even on large components. Based on the manufacturer data and specifications, measuring runs are created automatically with conclusive protocols based on current standards and regulations. The series variations and quality grades of the bearings are fully supported by the innovative KLINGELNBERG software. Additional measurement tasks based on specific requirements of the bearing manufacturer can also be implemented with ease.

P 40 - Proven solutions for gear measurement

Finally, KLINGELNBERG will be presenting the proven P 40 series of precision measuring centres for small diameter ranges in Stuttgart. These are optimal solutions for quality management processes on gears that are guaranteed to ensure future success. The machine and software concept of the P series is optimised for measurement of complex drive components. The technology replaces up to six conventional measuring machines: gear measurement, general coordinate measurement, optical measurement, form and position measurement, roughness measurement and contour measurement. These measurement tasks can be fully automated in a single clamping.

All machine models can be enhanced with custom options and feature specifications that make them ideal for performing measurements in the production environment. KLINGELNBERG precision measuring centres stand out for their



KLINGELNBERG Precision Measuring Centre P 100

patented, high-precision 3D NANOSCAN probe system as well as their easy-to-use roughness probe systems for external and internal measurements. This solution brings KLINGELNBERG close to the market and the user. The P series is a widely used standard in the industry for good reason and also serves as a reference for metrology institutes.

Experience expertise and technical know-how

KLINGELNBERG will also be presenting its services and software solutions, alongside the measuring centres. As usual, Dr -Ing. Günther Gravel, head of the Institute for Production Technology at the University for Applied Sciences (HAW Hamburg) will be on site as a measured value analysis expert. Again in 2019, he will be available at the KLINGELNBERG booth for two entire days of the exhibition to offer his technical expertise and take part in lively discussions.

Founded in 1863, KLINGELNBERG is one of the leading companies in the gear industry. On the background of many innovations in the areas of calculation, production, and measuring technology, the company sees itself as a leader in this sector. With its acquisition of Höfler Maschinenbau GmbH's core business in 2012, KLINGELNBERG has added machines for

machining cylindrical gears to its range of products, reinforcing its position as a complete system provider.

Headquartered in Zurich, the machine manufacturing firm now develops and manufactures at its sites in Hückeswagen and Ettlingen, as well as Győr, Hungary. The company also maintains a presence with sales and service offices and numerous marketing agents all over the world.

KLINGELNBERG solutions are used in the automotive, commercial vehicle, and aviation industries, as well as in shipbuilding, the wind power industry, and the general transmission manufacturing industry.

Applications range from vehicle drives, aircraft turbine engines, and cement mill gear units to drive systems for ships and oil rigs.

With over 200 patent grants, the company continuously demonstrates its capacity for innovation. Above and beyond this, its 14001 certification and participation in the VDMA's Blue Competence initiative give credence to the company's sustainable, environmentally sound business practices.

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New coordinate measuring system for inspecting complex components

Built in Castle Donnington, Derbyshire by LK Metrology, the high precision ALTERAM range of Coordinate Measuring Machines (CMMs) has been coupled with Renishaw's REVO-2 scanning system and multi-sensor technology to offer manufacturers a powerful 5-axis solution for inspecting the dimensional accuracy and surface finish of components. A notable design feature is the ceramic construction of the CMM beam and spindle, which combines optimal stiffness-to-weight ratio for exceptional responsiveness with mechanical and thermal stability for consistent performance across all manufacturing environments.

Offering unprecedented measuring speed, the SCANtek 5 multi-sensor package includes Renishaw's proven, intuitive MODUS software for importing data, controlling the CMM, acquiring results and reporting, including GD&T (Geometric Dimensioning and Tolerancing) labelling. The machine's high scanning speed boosts measurement throughput, shortens production lead-times, provides a comprehensive awareness of product conformance and prevents the metrology department from becoming the bottleneck in a factory.

SCANtek 5 is available with a variety of standard measuring volumes from 800 x 700 x 600 mm, 8.7.6, to 6,000 x 2,000 x 1,000 mm, 60.20.10, with larger options. The ALTERAM models, with repeatability from 1.5 µm, are being marketed alongside an ALTERASL range offering repeatability from 0.7 µm. LK is so sure of the long-term performance of all these premium machines that it is the only CMM manufacturer to offer a 10-year accuracy guarantee.

Ready for operation immediately, it arrives in the inspection room or on the shop floor. The 5-axis CMM gives users a competitive advantage, making it easier to win new work and helping to bring products to market faster. A 3-axis measuring solution, by contrast, is often unable to measure some complex features. In any case, it requires constant acceleration and deceleration of large moving elements of the CMM, whereas the rotations of the REVO-2 head are synchronised with constant velocity machine motions when

scanning, allowing changes in component geometry to be followed without introducing dynamic errors.

Scanning at up to 500 mm/s, without the stylus leaving the surface of the component, allows the coordinates of up to 4,000 points to be captured 'on-the-fly' every second, a rate of data acquisition far higher than is possible using conventional probing techniques. It is also possible to include rapid, single-touch routines into a measuring cycle. Moreover, the flexibility offered by infinite head positioning increases the effective measuring volume by minimising the need for head reorientations, whilst allowing highly complex measuring. Exchanging the REVO-2 scanning probe for one of the vision modules increases data collection rates further and the results can be correlated accurately with those acquired using tactile methods.

By employing different tip arrangements and knuckle joints, detailed surface finish analyses can be combined with other CMM measurements in a single operation, the basic output being Ra, RMS and raw data, with an extensive range of additions provided by standard and advanced surface texture options. Even fine bores down to 5 mm in diameter can be inspected. A variety of change racks, up to one metre in length, are available for housing sensors, probes and styli to enable automatic exchange during a measuring sequence.

The MODUS software, with its user-configurable interface, provides a powerful platform for the creation of programs, either by teach mode or from a CAD model imported via the usual graphical exchange formats or directly from CATIA, Siemens NX, Parasolid, PTC Creo or Solidworks. Wizards in the Windows programming environment employing conversational, graphical and drag-and-drop methodologies give access to a range



of macros and standard scanning routines such as helical, circular and sweep, to ensure best practice metrology, without the need for specialist programming skills. The native DMIS (Dimensional Measuring Interface Standard) program with drawing geometry, dimensions and tolerance data embedded can be simulated offline to check for potential collisions before the inspection cycle is run on the SCANtek 5.

A wealth of textual and graphical reporting functionality is offered, including multi-part inspection for series production and real-time reporting during program execution. Data exchange to third party applications such as Excel, XML or SQL is provided, as well as to Q-DAS for statistical process control.

A SCANtek 5 is available in LK's Castle Donnington technology centre for customer demonstrations. Two recently completed tests involved comparisons between 5-axis and 3-axis scanning of a cylinder head and an aero engine blisk. In the former automotive application, 12 valve seats and guides were inspected in 3 min 42 sec instead of 29 min 13 sec, an increase in

throughput of nearly seven times. In the case of the blisk comprising 29 blades, nine sectional, eight longitudinal and two root profile scans per blade were completed, plus one annulus profile scan, in a total of 2 hrs 10.5 min, compared with 22 hrs 11 min using 3-axis scanning. This provided a 922 percent productivity improvement.

LK Metrology is renowned for innovative CMM hardware and software solutions. The company's metrology products are used worldwide to control and improve the quality of manufactured components. Its precision technology underpins the process chain from design, development, production and assembly through to quality assurance in global industries such as automotive, aerospace, defence, motorsport, energy, medical and contract inspection.

Established in England in 1963, LK Metrology has an impressive heritage in metrology dating back to the birth of CMM technology. Founded by CMM pioneer Norman Key and his father-in-law Jim Lowther, LK Metrology is credited with many of the CMM industry's firsts including the first bridge-type design, first OEM to integrate computers, first to use a touch trigger probe, first to develop inspection software, first to use all air bearings and granite guideways, first to use carbon fibre composite spindles, first to use microprocessor-controlled drive systems, first to produce a truly thermally stable CMM and first to produce a high-accuracy horizontal-spindle CMM.

In 2018, LK Metrology was relaunched as an independent CMM manufacturer after several years as a division of Nikon Metrology. Headquartered in the UK, LK's CMM development and production are at the company's facility in Castle Donington. Sales and support offices are located in the UK, North America, Belgium, France,



Germany, Italy and China, supplemented by a worldwide distributor network.

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WENZEL Group achieves record 9,000th measuring installation

The WENZEL Group is celebrating following the installation of its landmark 9,000th high-tech measuring machine. Designed and manufactured by WENZEL, the product follows another important milestone in the German metrology specialist's history with the firm also recently commemorating its 50th year in the business.

The installation of the WENZEL LH 1512 3D Coordinate Measuring Machine (CMM) coincides with a record-breaking output of almost €92 m for the company in 2018, with strong sales success across its four regions DACH, EMEA, Asia and America. The CMM purchase also comes full circle. WENZEL has a prestigious history, with the very first measuring machine sold in Austria and now it's 9,000th going to another firm in the region, voestalpine KREMS GmbH. With growth expected over the next few years, the record-breaking sale is indicative of the German firm's strong position in the metrology market, as well as a mark of how measurement products are heading into the digital era.

Lauding the landmark installation and

prosperity across the region, Dr. Heike Wenzel, managing partner of WENZEL Group GmbH & Co. KG, says: "In 1981, the very first measuring machine built by WENZEL was sold by GGW Gruber in Austria. Now, the 9,000th machine manufactured in the German factory with the serial number 189000 has also gone to Austria. That cannot be a coincidence."

Installed at the Krems site in Austria, the decision to purchase the WENZEL LH 1512 3D CMM by voestalpine means the firm can streamline its operations across the automotive, construction, energy and wine & fruit sectors with high levels of performance and accuracy. Like all WENZEL machinery, the new CMM has been engineered from granite to eliminate heat sensitivity and increase precision within its new environment. The low cost of ownership, as well as the optimal price-performance ratio of the WENZEL CMM, were also core motivating factors behind the purchase of the 18-tonne machine by the Austrian technology specialist.



Renowned for its precision, the LH 3D CMM is the latest in high performance, bridge-style technology. Its long-term mechanical accuracy and ergonomic design, along with sensor choices to suit a wide range of applications, means the machine is ideally suited for situations which require high throughput. The WENZEL LH 1512's gantry design caters to this requirement and is specifically designed for the inspection of large-volume and heavy workpieces.

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PSL Datatrack supports Brown & Holmes growth and expansion

Brown & Holmes success over recent years has been reflected in its growth which has seen a doubling of production output, an increase in turnover of some 50 percent and the ongoing development of a global business. This has resulted in the acquisition of additional premises and investment in new machinery and staff. The creation of a new apprentice school is addressing the skills shortage in the industry as a whole and ensuring that the company's future is in the hands of qualified engineers who understand the company's business, production processes and Key Performance Indicators (KPIs). This is all supported by its PSL Datatrack production control system.

In 2002, Brown & Holmes of Tamworth became the first precision workholding manufacturer to use PSL Datatrack. Specialising in the design and manufacture of complex, bespoke workholding fixtures and tools, in recent years the company has expanded its business to cover new areas including robotics and more recently 3D printing, building upon the company's manufacturing expertise and embracing new technologies. The production and administration processes behind all of these business elements demand close control for Brown & Holmes to be profitable and fulfil its KPIs. This control has been achieved through continued investment over the last sixteen years in both standard PSL Datatrack modules and features customised specifically to support the evolving business.

Steve Smith, general manager of Brown & Holmes, says: "Proper production control is the key to our successful operation and the adaptability of the PSL Datatrack software, customised to meet our evolving production needs has been vital over the years."

Brown & Holmes recently updated its processes regarding the KPIs it reviews and, after a site visit from PSL Datatrack to discuss different reporting requirements, a new bespoke report that automatically details the activities of the business on a daily basis was formulated. This includes the value of orders received, invoicing value, purchase invoicing and the value of orders currently on the system.

The company's specialist workholding fixture design and manufacture, where



almost every job is different, still makes up around 60 percent of its business. Specially machined and assembled parts, standard components and 'bought out' items are usually required and these variables are managed from quotation to invoice by PSL Datatrack. When quoting, Brown & Holmes establish the details required including workpiece locations, orientation and clamping systems. The quotation is then generated using PSL Datatrack and the proposal sent to the customer on highly customised letterheads. Historical customer information is kept in a separate PSL Datatrack archive system, enabling the recall of any historic customer quotation and sales data.

Once an order has been secured, a detailed CAD drawing is produced and works orders for parts to be manufactured are raised in PSL Datatrack from the quotation. Process layouts are generated for use on the shop floor and all manufacturing times are recorded, allowing critical comparison between calculated and actual times taken.

Brown & Holmes now uses a wide range of PSL Datatrack modules quotations, works orders, purchase orders, scheduling, Shop Floor Data Collection (SFDC), CRM/Tasks, deliveries and invoicing, as well as benefiting from customised management reporting. All production data, including

inspection and finishing, is entered on a daily basis and PSL Datatrack provides accurate end-of-job costing which, together with the cost of purchased items such as material and subcontract operations, ensures that Brown & Holmes is constantly monitoring production efficiency and estimating procedures.

With all of these different elements to consider, two particular advantages of using PSL Datatrack spring to Steve Smith's mind: traceability and flexibility. Full traceability is provided, as every job is tied back to a specific works order number, encompassing purchasing, production, assembly, inspection, invoice/credits, delivery notes and conformance certificates. In terms of flexibility, PSL Datatrack has been adapted over many years and, for Brown & Holmes, is now almost a bespoke piece of software, due to the number of options that have been configured to address daily requirements.

The software also provides invaluable assistance across the company's robotic, precision engineering and new subcontract engineering business areas.

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Because technology alone isn't enough, the important thing is having the right software to get the most out of it.



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Lantek focuses on efficiency in production management with the launch of Lantek Global Release 2019

Lantek, a multinational leading company in the development and sale of CAD/CAM, MES, ERP and a pioneer in the digital transformation of companies operating in the sheet metal and fabrication industry around the world, has announced new features that have been incorporated in its 2019 version of software solutions. The new features are included in its Lantek Global Release 2019.

The new features extract and use data, generated in the daily operation of factories, so that it can be used to optimise processes and analysed to enable knowledge-based decision making. In the release, Lantek has included over 60 new features focused on production management and the integral automation of technology.

Focusing on its aim to help companies to manufacture better and more efficiently, while using the latest technological advances to give the machines greater connectivity and automation, Lantek Global Release 2019 provides users with a number of improvements.

Lantek has taken a new step in order to attend to the needs of a market that demands greater efficiency in processes and time saving on common tasks. Continual collaboration with its clients has resulted in over 40 general improvements within its popular Lantek Expert CAD/CAM 2D sheet metal cutting software.

Innovative technology enables managing the destruction of holes, skeletons, and remnants to assist the operator in the evacuation of finished parts. Automated processes have also been introduced to simplify workflow. By automating tasks, routine processes are concatenated and nesting groupings can be improved according to the customer's needs.

To resolve part identification and traceability requirements, Lantek has



increased the possibilities within its parts databases, so that parts can be marked with QR codes automatically and semi-automatically in addition to marking metal sheets and remnants. This innovation makes it possible to encapsulate the information associated with the part. This may include the operations and characteristics that must be incorporated into the part once it is cut.

Lantek has also optimised data collection and control capabilities, increasing its cutting machine database, which, at present, includes over 1,200 models from practically every manufacturer on the market, as well as improving the quality of production data collected.

For improved integration and management of 3D models for the cutting and bending process, the 2019 version has been enhanced with the integration of the main CAD systems. This important development increases the possibilities for working with programs and files, incorporating all of the main 3D graphic formats that are currently on the market. The system can now also manage different bending parameters for each operation, such as bend length, bend angle, bend radius, K-factor, special bends, rotation or tool change and is able to generate STL files, DXF files, which can generate CNC code and LSTC files, with all the bending information. The 2019 version incorporates new machine models and includes the latest different methodologies for laser tube cutting. Optimised cutting

depends on the mechanical capacity of the machine and, for the operator, simplification of cutting management, management of remnants and the evacuation of the part.

Asier Ortiz, technical director at Lantek, says: "Our only aim, with this full repertoire of improvements, is to give Lantek solutions new power to help production managers even more quickly and easily. With the data tracking and analysis that we can carry out, we are ready to bring intelligent manufacturing closer to a sector that needs to move towards Industry 4.0 to remain competitive. This update is truly worthwhile."

Adequate production management and planning is one of the keys to achieving success, in manufacturing processes, for factories of the future. Lantek MES incorporates a total of 19 highly significant new features, with the objective of finding new ways to optimise production.

Users will now be able to see production planning fully and in real time in different views, sequences or Gantt charts, thanks to the new Lantek MES Monitoring module. The simplicity, power and immediacy of this module keeps daily production always in the spotlight. Added to this is a series of general efficiency improvements.

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Making work easier in tougher trading conditions

Managing the progress of jobs simply yet effectively is essential for any company or organisation whether they are manufacturing goods or providing services. Few would disagree that trading conditions in the UK are likely to become even more challenging through 2019, so the focus on



improving efficiency, improving processes and maintaining a competitive edge will be more important than ever.

Since being introduced over 60 years ago, T CARDS have been a traditional way of managing tasks and resources for a wide variety of applications. For thousands of companies they have proven to be an excellent tool and have been implemented with minimal effort and cost.

The simplicity of the T CARDS board system means it can be adapted very easily and will provide benefits almost immediately with virtually little or no training. The simple, visual nature of T Boards is why it has become so successful, when an update or information about a task needs to be shared. These benefits are even more relevant especially when margins are being squeezed and profits are under pressure. Marginal gains become even more important when trading conditions are tough and difficult.

T CARDS director, Phil Heine comments: "We have witnessed over many years that

during downturns in the economy there is increased interest in T Card Systems. Companies find it even more important to have a way of visually communicating what is going on, what stage jobs are at and to make sure workflow is as streamlined as possible. Sometimes a T Board costing less than £100 can bring significant benefits in providing clear and precise information."

If you are using a white board or some sort of post-it note arrangement to plan or track, what happens to the information when things change? With a T Card system, you have something that you can use to originate, update and then file information and you also have a purpose made T Board that reflects what you need showing the status to others in a clear and professional way.

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Mako surfs through implementation of 123insight MRP in just two weeks

Mako Board Sports Ltd, based in Semley, Dorset, manufactures the Mako slingshot jetboard. As part of Gilo Industries, Mako was founded in 2017. Sister company Rotron Power, who manufactures the motors for Mako, had already been successfully using 123insight, so upon the foundation of Mako the direction was clear.

Supply chain manager, Richard Bromley says: "Our sister company Rotron had been using 123insight MRP software for many years. When it came to looking at using a similar system for Mako, it was a foregone conclusion to use 123insight. Because of the history of using the system, we knew the benefits of it and how we could adapt it for our company."

The company set about designing the structures and workflow for the business and started implementing late in 2017, with training scheduled for the second week in December. Operations manager, Adam Collins noted that, although they had experience of 123insight's capabilities through Rotron, Mako had higher aims: "The short-term aim was to use it as Rotron did, so you just knew what was in stock. But we knew from the inception of this business that we wanted to capture all of the data. It would capture everything from when that raw material comes in, right through to the



build, along with the resource you need to carry out that build. We could also capture all of the data around clocking on/off, giving us the time to build the boards. We're trying to collect 'big data' from all of the different environments that we work in, bringing it all together, look at what we do, how we do it, and how we can improve. If we can improve it, we can make ourselves better, faster, cheaper and more profitable."

Richard Bromley adds: "It helps splitting the project into short term and long-term goals. Short-term was essentially what we needed to do to get the ball rolling with the system and how we wanted it to work, so data capture and stock control were the initial first thoughts."

Staff attended the six-days of no obligation training, on the understanding that if they decided not to move ahead with the system they could walk away with nothing to pay. Although Adam Collins didn't attend the training himself, he still felt

the benefit of 123insight's training methodology.

Mako planned to implement and go live in under two months, but Richard Bromley had other ideas: "We were quoted by our customer care manager that it would take about 6-8 weeks, but we wanted it done by the end of the year. We basically had 3-4 weeks in December to get it built and running. In all honesty it was actually quite simple, mainly because our company was new. We had no pre-existing system in there, so we were starting fresh with 123insight."

The company went live on 22nd December 2017, just two weeks after commencing training.

As both Rotron and Mako are based at the same location they also share a server, with one benefit being that they can share licences between companies, in addition to being able to increase or decrease licences on a monthly basis as required. 123insight's



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service and repair functionality has also proven useful.

The company implemented Shop Floor Data Collection (SFDC) across the shop floor, installing barcode scanners in production, store and despatch and allowing staff to clock on/off of works orders. Richard Bromley was surprised at the quality of data that it delivered: "There's a difference between predicting, recording with pen, paper and stop watch, and actually scanning to a works order. The difference between that is massive and it's a lot more accurate to capture it that way. It also means that you get the product built quicker. We can report back to sales that the lead time is now X and it's a more accurate representation of what it will be, whereas before it was more of a guesstimate."

Mako is aiming to implement ISO9001 and 123insight's advanced serial tracking will be instrumental in this. The serial number of the board is entered on arrival, with other serialised components added during manufacturing. It's then very simple to track what items were included in which board, or which boards include a component from a specific batch.

Many customers visit the Mako facility, so



it's important that the image of quality and control is visible throughout the business. Mako now display KPI (Key Performance Indicator) information throughout the facility, on screens, via a PowerPoint presentation that draws live data from 123insight's SQL databases.

The company also extends 123insight's reach to its website, using Solweb's Web Portal. This allows for complete e-commerce capabilities and for live stock information to be displayed on the website. When orders are placed, a sales order and customer data are automatically transferred to 123insight.

A few months after going live, Mako opted to implement 123mobile, an

iOS/Android app that allows users to manage stock and shop floor labour bookings on a tablet, this has been invaluable during setup of the new stores facility. As part of its continual streamlining of production processes, Mako is moving from 'project' manufacturing of boards and sub items together through to batch manufacturing.

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Renishaw collaboration demonstrates additive manufacturing capabilities for spinal implants

Global engineering company Renishaw has collaborated with two advanced technology companies to demonstrate the advantages of additive manufacturing (AM) in the production of spinal implants. By working with the Irish Manufacturing Research (IMR) and nTopology, the project shows how streamlined the transition from design to AM can be when working with the right partners.

Manufacturing research organisation IMR designed a representative titanium spinal implant, aimed at the cervical spine, using advanced manufacturing software company nTopology's generative design software. IMR then manufactured the implants using Renishaw's RenAM 500M metal AM system.

"AM can be used to manufacture spinal implants with lattice structures, which cannot be achieved with conventional manufacturing techniques," explains Ed Littlewood, marketing manager of Renishaw's medical and dental products division. "An implant with a lattice structure is lightweight, can be optimised to meet the required loading conditions and has a greater surface area, which can aid

osseointegration. Therefore, AM implants can be designed to mimic the mechanical properties of bone, resulting in better patient outcomes. But all of this comes to nothing if you do not have the tools to create the design."

Matt Rohr, nTopology's application engineering manager, comments: "Traditional CAD tools were not built to design complex lattice structures; the job would be difficult or even impossible. nTopology was designed to complement existing workflows and make the job easier. We cut the design time of complex structures from days to minutes which was a crucial component in helping this project run to schedule."

Sean McConnell, senior research engineer at IMR, adds: "Renishaw worked tirelessly with us on improving the AM process for producing the spinal implants. Together, we designed a set of experiments that yield the most appropriate parameter settings for the product. As a result, we reduced the amount of post processing required on key features of the implants by a factor of ten."

Patients with medical conditions including



degenerative disc disease, herniated disc, spondylolisthesis, spinal stenosis and osteoporosis can require spinal implants to restore intervertebral height. The improved implant design, made possible by AM, means patients may require shorter surgery time and fewer revision surgeries, saving healthcare resources and costs.

Renishaw also uses its AM machines to produce healthcare products, such as craniomaxillofacial implants and dental frameworks, at its site in Miskin, South Wales.

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OPEN MIND presents latest CAD/CAM suite and expanded high-performance package

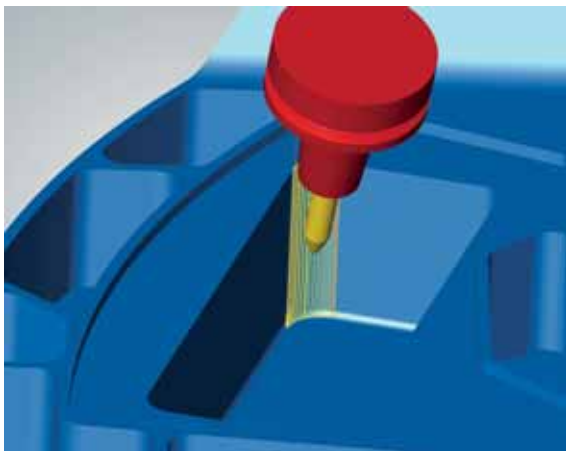
The latest version of the hyperMILL® CAD/CAM suite, 2019.1 is now available. OPEN MIND, one of the leading manufacturers of CAD/CAM solutions, has expanded the finishing module in the hyperMILL MAXX Machining performance package. Further highlights include process optimisations as well as new functions for reducing calculation times.

'5-axis Prismatic Fillet Finishing' is a new function in the finishing module of hyperMILL MAXX Machining. Thanks to the geometry and automatic setting of the barrel cutter, this feature can be used in accordance with the principle of a high-feed milling cutter.

The processing takes place in a plunging and pulling movement with an extremely high feed and this allows the highest machining performance possible with high-performance conical barrel cutters, also called circle segment or parabolic cutters. Ball and radius cutters can also be used efficiently with this strategy.

Process optimisation at a glance

Thread milling options have been completely redesigned for hyperMILL 2019.1 to improve convenience and user friendliness for the programmer. The module supports a variety of different thread milling cutter types and allows extremely easy selection of right-hand and left-hand threads or the definition of the milling direction from bottom to top or vice versa. The thread milling feature also offers automatic approach and retract macros, a selection of roughing options and simplified programming.



Changes without recalculation

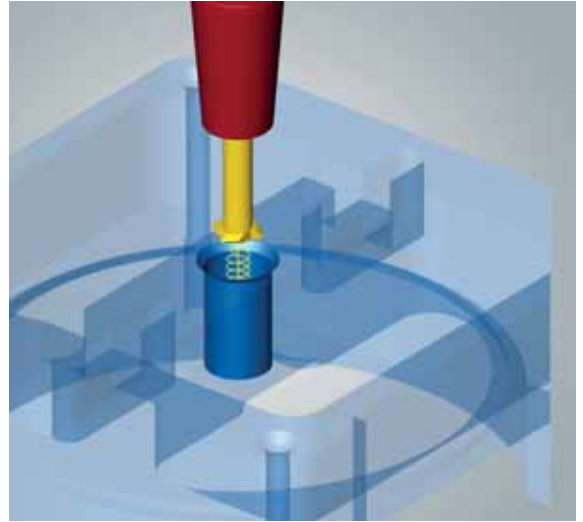
hyperMILL manages the order of the processing steps with job IDs. Changes to these job numbers have so far resulted in recalculations, these are now avoided to save time. The improvement in job management now means that a job ID can be changed without having to subsequently recalculate the machining job in question. The consecutive numbering of the compound and machining job is controlled via a start value and an increment value. The benefit of this new feature is transparent structuring and reduced calculation times. The clamping position can now also be changed later without the machining jobs having to be recalculated.

Improved management of standard and special tools

The tool database in hyperMILL has received a small but fine improvement. Until now, there was only one comment field. In Version 2019.1, users have the option of individually expanding the tool database. As a result, information such as order numbers, prices or service life can now be clearly stored and the CAM programmer is able to manage tools even better than ever before.

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

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



CAD solutions and extensive programming automation. The company has made a name for itself internationally as a pioneer in innovative 5-axis technologies.

OPEN MIND strives to be the best and most innovative CAD/CAM manufacturer in the world, helping it become one of the top five in the CAM industry according to the NC Market Analysis Report 2018, compiled by CIMdata. The CAD/CAM solutions of OPEN MIND fulfil the highest demands in the automotive, tool and mould manufacturing, production machining, medical, job shops, energy and aerospace industries. OPEN MIND is represented in all key markets in Asia, Europe and America, and is a Mensch und Maschine company.

Today, OPEN MIND stands for a fully integrated product concept with solutions for automated programming, optimised processes and efficient manufacturing. New ideas are constantly being created for modern manufacturing thanks to this unique blend of computing and production expertise, experience and vision, international character and customised service.

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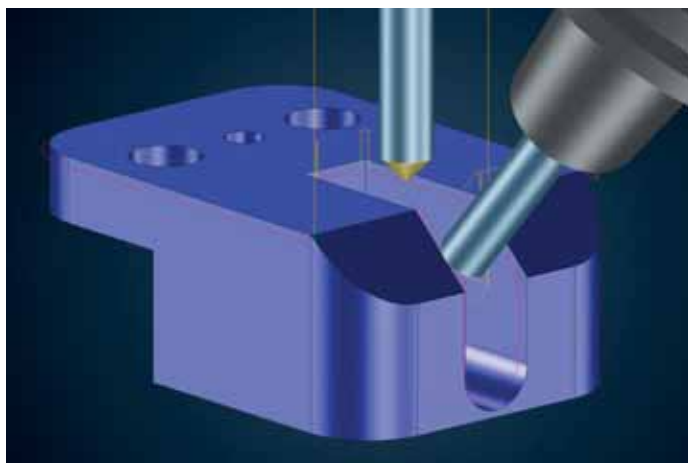
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A look into the future

CAD/CAM and MES specialist Tebis has launched the next release of its Version 4.0 software in the first quarter of 2019. The new release sees new and improved tasks that are designed for users who want to better utilise the potential of their modern high-performance machines and keep their manufacturing processes ahead.

User interface

Significant time can now be saved with this new release. There is a new way to transfer user configurations, which will include easier methods to transfer toolbars, work environments and other user settings, from a previous release with the click of a button.



Interfaces

The new updates in the importing STEP data interface will be used to specify whether to include covered geometries and axes systems, as well as references in the import. This will also add more efficiency in importing small structures.

Manufacturing preparation

All sharp edges in a part can be detected with this new function, which will store and generate edge surfaces with a structure for optimal preparation of deburring with NC machine templates. This function will create the outline surfaces for cutting and restricting dies with a step relief at any cutting angle.

NC machine calculation

Users can machine edges with ball or tapered cutters, using the new 5-axis deburring function. It provides the ability to swiftly and easily create practical toolpaths for deburring, with automatic tilt direction calculation and automatic avoidance of shank and toolholder collisions.

3D surface machining will also have a sorting strategy, which allows users to organise the paths in a more efficient way. The paths can be further sorted from outside to inside in the "axis parallel" strategy. This provides a perfect surface finish in every situation.

Another offering in Release 7 is residual stock analyses in the Job Manager. This further enhances the analysis function to obtain results directly from the Tebis NC Job Manager. Users will be able to understand exactly how much residual, stock material is left on a component.

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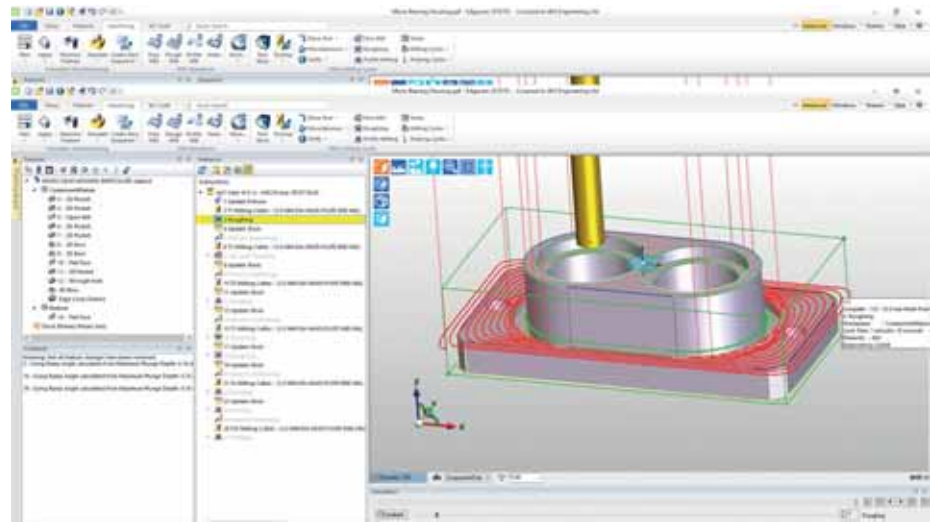
Seco Tooling's EDGECAM programs slash manufacturer's cycle times

An engineering subcontractor recently moved all its CAM programming across to EDGECAM after Seco Tooling provided it with support solutions to specific issues on complex components.

I & G Precision Engineering had used EDGECAM to drive an Emco lathe, operated by the firm's managing director Andrew Evans, since investing in CNC machinery in 1992. But as it expanded with further machine tools and more shopfloor staff, other CAM packages were brought in.

Andrew Evans states: "Originally, we used EDGECAM for both milling and turning on those new machines, but when I came off the tools we decided to try other systems and it was eventually only used on the lathe."

Operating out of 11,000 sq ft premises in Ystalyfera, Swansea, with 11 employees, the company largely manufactures parts out of stainless and tool steels and aluminium, for aerospace, food, beverage, medical and defence customers, along with the Royal Mint. It makes a number of components for aerospace ground support systems, such as jigs and fixtures for removing engines and wing parts, along with bakery equipment including rollers for production machines, castings for dough-rollers and electronics housings for defence customers.



It has also received commendations from the NHS for its work in devising breathing apparatus for new-born babies to inhale Xenon gas as part of medical treatment.

Andrew Evans' son, Mike, who is engineering director and workshop manager, says the company works closely with Seco Tooling, who recently provided them with tooling and programming support to improve the production process on a specific job: "We saw immediate benefits, as the job used to take us around three hours, including two hours for just one

operation, but using EDGECAM the full process was completed in an hour.

"When we looked at how EDGECAM machining strategies could improve our cycle times, it became a no-brainer that we should go back to it on our full range of Haas CNC machine tools, and our new Mazak vertical machining centre."

All new components now go through EDGECAM, and production runs of older parts are all being reprogrammed with EDGECAM.

Mike Evans explains: "We're saving up to 40 percent on cutting cycles, which has a tremendous impact on the bottom line. It improves our margins, making us more profitable and frees up the machines, giving us additional capacity to take on more work. EDGECAM is a vital part of our manufacturing process now. It runs the entire production process."

He says the software's milling and turning modules ensure they can ship between 600 and 700 components each month, normally on a three to four-week lead time:

"EDGECAM is so simple to use. The customer sends us a STEP or IGES file, or any other CAD file, which we import into EDGECAM and create the fixtures and fittings, identify the CNC machine we'll be using and the stock. Then, we run Feature Finder to identify all the features of the parts and generate toolpaths."

He adds that machining processes are considerably more stable now than under



the previous CAD/CAM package: "With our old software, when the cutter was coming into a corner you could see the machine loads spiking, which we don't get with EDGE/CAM. We can run programs overnight, rein the stepovers back and know the tooling will last for the entire production run."

He describes EDGE/CAM's powerful game-changing Waveform Roughing capability as "massive" for the company's growth plans, in terms of driving down cycle times and increasing capacity, enabling them to take on additional work: "We do a lot of 3D milling of features such as pockets and we used to machine the roughing cycles in the traditional way, often just stepping down 1 mm at a time. EDGE/CAM allows us to step down up to 10 or 15 mm at a time. Then, as we pocket out to those depths, we can profile back and come out of the pockets. So it saves considerable time."

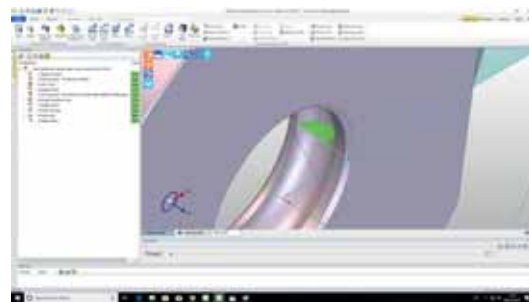
He says: "At first, when those programs were coming in from Seco Tooling, we were concerned that the increased feeds and speeds would break the tools, but then we saw how well they worked and it now gives us the opportunity to push the machines to their limits."

Citing a project where Waveform slashed the roughing cycle from 30 minutes to ten minutes and helped reduce the overall machining time by half, Mike Evans says: "We manufacture a particular component for the atomising industry, which is used to turn metal into a powder for hard surfacing materials.

Traditionally it was a turning job, but Waveform means we can now mill the grooves. This was a huge revelation and made us think of doing jobs in a completely different way."

The company is planning more investment in the coming 12 months, including EDGE/CAM INSPECT, which creates measurement cycles on the machine tools. The intuitive user interface and workflow gives a seamless transition from programming CAM cycles to measurement cycles by incorporating metrology technology from Hexagon Manufacturing Intelligence.

Mike Evans comments: "This means we'll be able to inspect every part on the machine if necessary, after each operation and provide a customer report." The company is also considering a 5-axis machine and



possibly a Coordinate Measuring Machine (CMM) from Hexagon.

Concluding, Andrew Evans says I & G Precision introduces EDGE/CAM to its apprentices immediately: "We've currently got three apprentices at various stages and they've all taken to EDGE/CAM like a duck to water. The skill set is changing; a lot of the old traditional craftsmen's skills are dying out and engineers need to embrace computer-led skills to produce the components properly. Edgcam helps engineers deliver what's needed by having several ways of achieving the same result."

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CGTech debuts VERICUT Composites V8.1.2 software

At the 2019 JEC Composites show, held last month in Paris, France, CGTech demonstrated how advanced programming strategies and simulation can lead to better composite parts.

CGTech's Composites V8.1.2 release of VCP and VCS features a completely redefined Graphical User Interface (GUI), enhanced suite of programming and analysis tools and redefined methodology through the use of the powerful new Laminate Manager. The Laminate Manager helps users easily manage files, processes and batch actions for the entire composite laminate. Internal refinements ensure that large projects are now able to be programmed and simulated in a fraction of the previous time.

The aerospace industry continues to push for lighter, faster and more cost-effective parts. To support these goals, VCP now puts more power into user's hands. With more information available than ever before, part programmers can generate and export part statistics directly from VCP. The addition of the all-new summary reports allows

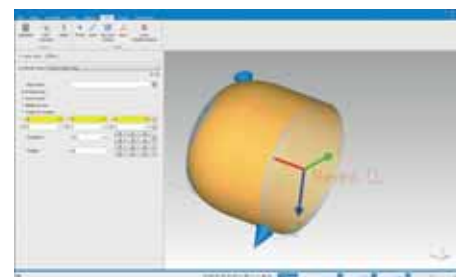
engineers to compare different layout strategies and feel confident the optimal design prevails.

"However, one should not stop at the programming stage" says Tony Shrewsbury, managing director of CGTech Ltd.

"Companies now more than ever are realising the importance of simulation and the digital twin model. With VCS, users can watch their parts come to life on their machine, leaving them confident that the intended design will match what is manufactured."

CGTech also presented its latest version of VERICUT software. VERICUT 8.2 is a leading CNC machine simulation, verification and optimisation software that enables users to eliminate the process of manually proving-out NC programs. VERICUT simulates all types of CNC machining, including drilling and trimming of composite parts, waterjet, riveting, robotics, mill/turn and parallel kinematics. VERICUT runs standalone but can also be integrated with leading CAM systems.

CGTech's VERICUT software is the



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

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Customised data documentation

Three software packages for increased transparency and productivity

Recording welding data for documentation and analysis purposes is becoming increasingly important. Firstly, it ensures transparency and safety. Secondly, automated data collection saves time and helps increase productivity. The WeldCube data documentation solution from Fronius comes in different versions to meet the needs of small enterprises right through to major corporations.

Documenting production data ensures the transparency and traceability of individual steps in the production process, which contributes towards consistent quality in production and helps minimise risks. Managing data digitally also saves time and money, as handwritten notes become a thing of the past and an analysis can be generated at the touch of a button. A digital data management tool for welding technology helps users keep an eye on each individual weld seam as well as the overall system status, allowing errors to be detected. WeldCube from Fronius delivers all of these benefits. Users can choose from three different versions: Light, Basic and Premium.

Keeping an eye on every weld seam saves time



WeldCube Light is the beginners' version. Data is gathered decentrally for each welding system, enabling traceability at weld seam level. The web-based feature is contained in the SmartManager of every Fronius TPS/i power source and can be used free of charge. The system records the time, duration, current, voltage, wire speed and power for each weld seam and stores the mean value. Users can export this information as a PDF and the parameters of jobs can also be viewed and compared. WeldCube Light conforms to EN 1090.

WeldCube Basic is the ideal solution for



smaller businesses, where only a limited number of welding systems are in use. This version of the software decentrally records the precise actual values at a sampling rate of up to 100 milliseconds. It is also possible to monitor limit values, for each welding task users define parameter limit values and the system informs the user if these are undershot or exceeded. Part that may not conform to the required quality standards can therefore be checked and rejected

immediately. Like WeldCube Light, with WeldCube Basic data is recorded on the welding system itself and can be viewed online for each TPS/i. The user can create or edit jobs in the tool and transfer them to other devices using the import and export function, saving them time. All data can be exported as PDF or CSV files.

Central solution for component-based documentation

WeldCube Premium saves welding data from multiple Fronius systems in a central database. In addition, it offers intelligent management, statistics, and analysis functions. Saving data from networked Fronius systems centrally enables data to be documented in relation to each component and separate PDF reports to be generated per component. WeldCube Premium monitors the progress of a component and provides details on every weld seam. The



software uses a traffic light system to show in real time whether a seam has already been welded and whether any limit values were violated. The system prepares data analyses in table or graph form at the touch of a button. With the help of intelligent filters, users can create and share their own statistics. What is more, they can customise the user interface to meet their needs. Prepared data can be sent to third-party systems using the file export feature and web API interface.

Fronius UK to host its fourth Open House

Fronius UK promises an informative day brimming with fun as it hosts its performance inspired Open House at its Technology Centre in Milton Keynes on May 15th.

This is when the company will be opening its doors for visitors wanting to find out how they can fast-track to a higher level of performance. The day will cover the latest cutting-edge welding technology and processes from the experts in the field. Not your average Open House, this free event offers guests the chance to do a lap of the company's technology centre, test their speed, accuracy and motor skills in various challenges throughout the day and enjoy a fun-filled day packed with interesting seminars and demonstrations. And with the theme of the day being performance, the day's entertainment would not be complete without one or two performances that are sure to captivate.

When operating in a fast-paced environment with technology constantly evolving, the expectation to perform is high and the capacity to keep up can seem overwhelming, if not a little out of reach at



times. When it comes to welding, Fronius is committed to providing the technology and ongoing support that customers require in order to meet performance goals. If there was ever a time to review welding processes, or just find out what's new, it's now and Fronius has just the event.

The technology day will be filled with product demonstrations featuring the very latest state-of-the-art systems. These include the highly flexible TPS/i welding system, integrated with the legendary CMT process for manual and robotic welding applications, data analysis capabilities using the Fronius WeldCube, the newest, faster TIG welding process, ArcTig, which requires no prep on materials up to 10 mm, Wire+Arc Additive Manufacturing (WAAM), the new generation of lightweight, portable and cordless welding systems and much more.

The day would not be complete without topical seminars from both Fronius and many external industry experts and gurus, providing visitors an informative day of product, process and industry knowledge. Subjects range from industry related products and associations right through to using social media to enhance your business' performance and EV topics. A full list of speakers is available by visiting the registration website. Fronius is also active in the fields of battery charging and solar energy, so attendees will have plenty to feast their eyes over as this event caters for all three divisions.

Sheldon Brear, director of welding for Fronius UK, comments: "The Open House is an ideal opportunity to visit our facility and gain insight into the latest trends and solutions available in today's market. We look forward to welcoming all those interested in welding, to understand their welding challenges and to work with them on improving their welding processes."

The Fronius UK Open House will take place on Wednesday 15th May from 9am-4pm with a hot lunch and refreshments being served throughout the day in the Fronius Biergarten. For more information about the Open House, demonstrations, exhibitors and seminars, and to register to attend, visit www.froniusopenhouse.co.uk

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Welding cell is Arc de triumph for Kawasaki Robotics

Telford-based automated systems manufacturer Bauomat, one of Kawasaki Robotics leading integrators, has recently supplied and installed a robotic welding system to precision pressings and stampings experts Clamason Industries of Kingswinford. Clamason is an ISO 9001 / 14001 accredited supplier to industry and is well known across the automotive and medical sectors.

Bauomat supplied Clamason with a HiArc 200M, one of its more compact robotic welding systems specifically configured for arc welding. The system is manufactured and integrates a Kyrus manual rotary manipulator but the company can provide feature powered manipulators depending on customer specifications.

Clamason's new system also includes many user-friendly features to ensure consistent weld quality, one of which enables the operator to input the parts and begin the welding cycle manually. Loading two assemblies into the Bauomat designed and manufactured tooling, the operator then manually rotates the manipulator into the system to begin the cycle.

Programmed by Bauomat's experienced robotic engineers, the chosen robot, a Kawasaki BA006N, then follows the programmed weld path, joining three parts together to form a small pressing assembly. Thanks to advanced sensor technology designed into the tooling, the system recognises what has been put into the workstation and reacts accordingly. For instance, if the parts are incorrectly loaded, it identifies the anomaly and the robot will not begin the cycle until the correct loading profile has been put into place. Demonstrating machine flexibility at its best, if only one set of parts has been loaded rather than the normal two sets at a time, the robot will only weld the single assembly

present, ignoring the adjacent empty fixture.

A full Fronius robot package has been integrated into the system, consisting of a TPS320i MIG welding power source, a wire feeder, loom, torch and crash system. Together with the speed and precision of the Kawasaki robot, all these parts combine to assist in making the welding process quick and efficient. To improve the performance of the cell and further reduce both cost and downtime, the system also includes a Tipman torch cleaner which removes debris from the torch tip to maintain a consistent welding quality with each cycle.

Fronius also provides Pulse Multi-Control (PMC) and Low Spatter Control (LSC) software, both of which were included in this installation. To maintain a clean, top quality weld, PMC controls the heat input with extreme accuracy, to help minimise any distortion of the parts, adjusting the arc and keeping it stable. Concurrently, LSC, as the name infers, minimises spatter and increases arc stability through a short-circuited transfer mode. In applications like this one which demand the highest integrity of weld, the Fronius PMC and LSC combine with a Kawasaki robot to permit to mass production volumes without compromising on quality.

In common with all Bauomat systems, this Kawasaki Robotics / HiArc 200M system is fully and securely enclosed using Talos guarding by Kyrus: a high-quality construction made using aluminium extrusions and featuring easily changed panels. Safety access fittings by Fortress Interlocks are also integrated into the system for ultimate machine and user security.

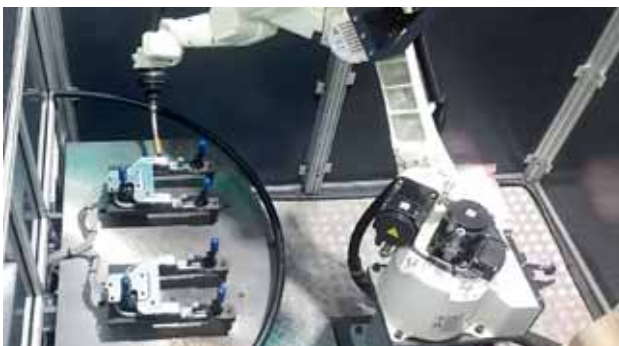
Kawasaki Robotics has been supplying industrial robots to manufacturing industry since 1969, and its BA006N, as used by Bauomat in this application, is a popular choice for users needing a specialised robot designed exclusively for arc-welding installations. The machine is a full 6-axis robot, featuring a reach of



1,445 mm and capable of carrying payload of 6 kg. Despite its speed, the Kawasaki BA006N is delivered to customers with repeatability to +/- 0.06 mm guaranteed over the lifetime of the robot. Kawasaki Robotics offers a comprehensive range of associated equipment for arc welding, allowing both customers and integrators almost unlimited freedom to use their own preferred sources whatever the application.

Ian Hensman of Kawasaki Robotics says: "This recent installation at Clamason further highlights the excellent working relationship we continue to enjoy with Bauomat. Our shared vision of delivering bespoke systems, that provide customers with unrivalled performance, remains at the forefront of the many applications we work together on."

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Cartridge filter media production enhanced by Telsonic's ultrasonic technology

The use of ultrasonic technology for welding and joining applications continues to expand at a pace, as the flexibility and capability of the process is realised by a growing number of industry sectors. A recent application by Telsonic UK demonstrates a state-of-the-art approach to the production of pleated filter media, in a machine that is capable of manufacturing a comprehensive range of filter component sizes.

Parker Filtration has two existing Telsonic machines that have been reliably running in production for some 15 years. As the range of filter components being manufactured by the company continues to expand and demand for the product increases, Parker has turned once again to Telsonic for the supply of a next generation system.

The new system not only incorporates the latest in Telsonic's ultrasonic technology, but a host of additional features aimed at improving efficiency, ergonomics and process data acquisition. The machine is used to ultrasonically weld and seal the longitudinal part of pleated filter membrane material.

The range of products to be manufactured by this new machine covers a total of 10 different pleat depths and two different lengths 800 mm and 1,100 mm. Combined with these variants, are the number of pleats that relate to the filter

diameter. The machine has been designed to be fully automatic in operation, once the product to be processed has been loaded by the operator.

This stand-alone machine uses a heavy duty electric servo driven table to index the pleat packs progressively under the welding head. The machine has a universal clamping system for the pleats, including a servo operated pre-opening jaw to accommodate all variants of pleat and pneumatically operated final clamping for the lip of the jaws. Light guards protect the operator during the load and unload sequences. The machine has a HMI / PLC system which is used to control and configure all part related adjustments, table movements, three or four welds dependant on pleat length and weld recipe based upon the selection of a Parker Part number and includes process monitoring.

The ultrasonic welding technology within the machine is based upon Telsonic's USP3000E Press complete with a 20 kHz MAG 3.6 kW generator and touchscreen interface. This interface allows recipe input, recipe storage and setup with visual displays and the capability to output all weld evaluation data. The weld recipe facilities are fully electronic including proportional pneumatic weld pressure control, weld limits and data bit selection in collaboration with the machine main PLC / HMI control system.

The welding press station has an integral anvil, pleat traverse guidance tooling and part present sensors. A single 280 mm long titanium sonotrode is used for all pleat variants, with operations completed within a 26 second cycle time for a four weld pleat pack. A facility to rotate the welding press, within the machine, provides access for easy mechanical setting and quick ultrasonic head change over or servicing.

Telsonic UK was selected for this project due to the holistic approach offered by the company. This encompassed satisfying

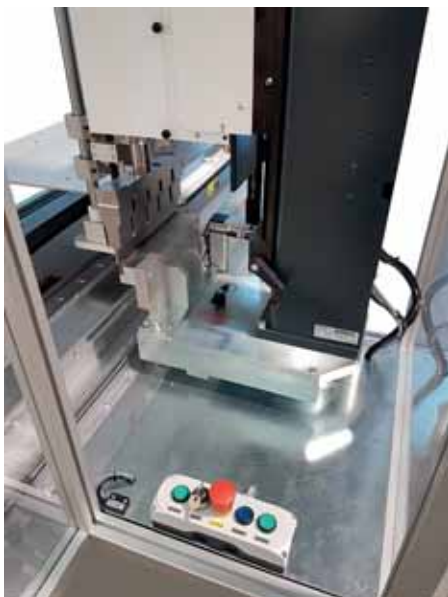


Parker's ergonomic and system operational requirements, in addition to building a reliable production process around the ultrasonic technology. The proven reliability of the existing Telsonic machines, which have been operating over a 15 year period and the continuity offered by Telsonic's extensive application knowledge and service support, also played a significant part in the selection process. In depth operator training courses were conducted at Telsonic's Poole facility ahead of delivery and installation of the system.

Telsonic UK offers a comprehensive range of ultrasonic modules and systems for a variety of plastic and metal welding, cutting, sealing, cut'n'seal, food cutting, sieving and cleaning applications within a wide range of industries.

Telsonic AG is an international enterprise in the field of industrial ultrasonic technology and a global market leader. The company, which was founded 52 years ago and is based in Bronschhofen, Switzerland, employs approximately 250 staff worldwide and has subsidiaries in the UK, Germany, Italy, the US, Canada, Serbia, China and Korea, as well as representations in many other countries.

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New centre of excellence for robotic welding

Motion control and robotics specialist YASKAWA's expansion and investment program continues apace with the opening of a new centre for robotic welding, milling and material handling applications in Newton Aycliffe, County Durham. The Yaskawa Northern Technology Centre represents a significant investment in excess of £250K and will enable the company to showcase solutions for welding, cutting and palletising applications.

The new centre will feature the latest robotic arc and spot-welding applications using the full range of Yaskawa Motoman robots, positioners, power sources, weld controls and turnkey solution cell systems. It will enable Yaskawa's customers to conduct customer demonstrations and trials on their products as well as customer product training for online and offline programming.

Yaskawa Motoman's ArcWorld robotic welding systems are pre-engineered, pre-assembled and shipped ready to weld, delivering the most flexible and cost-effective options to integrate robotics into welding processes. ArcWorlds can be

configured with multiple robots, a heavy-duty positioner or servo-controlled external axes for coordinated motion control.

SpotWorld® is a complete work cell with robot, process equipment, part positioner and safeguarding package which leverages Yaskawa Motoman's MS-series robots and welding positioners to pattern work cells. This, combined with Yaskawa's popular ArcWorld® product line and servo-controlled spot guns with Direct Current (DC) spot timers, ensures optimum synchronisation and improved quality and reduced cycle times.

Commenting on the new Northern Technology Centre, UK sales & marketing manager Jonny Grey says: "Yaskawa Motoman offers manufacturers a wide range of robotic solutions for today's and for future welding, milling and materials handling applications. Our investment in the new Northern Technology Centre is another example of how we are bringing these benefits to as many of our UK customers as possible."



YASKAWA is one of the largest manufacturers of industrial robots, with 400,000 robots installed worldwide. In addition to application-based variants such as welding, palletising, painting and handling robots, the broad range of robots includes robots designed for laboratory and clean room applications as well as top quality, turnkey automated welding systems.

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Northern Ireland manufacturer adopts automation in a bid to bridge the skills gap

There is currently a skills gap affecting the manufacturing industry. Manufacturers are facing significant difficulties in filling vacant positions due to a lack of qualified and skilled applicants and as demand increases, manufacturers are having to think outside the box to identify ways in which they can continue to support product output.

The primary skills that are needed to fulfil traditional, industrial tasks such as welding, are simply not there. The truth is that millennials don't want to work in many of the key manufacturing industries that drive the UK economy and an ageing workforce means business owners are having to compete to recruit the right people with the right skillsets.

So, what do we do? One answer is we automate. If we are not able to employ a skilled operator to undertake the tasks necessary to ensure the continued success of our operations, we get a robot to do it for us.

One such company who was finding it difficult to source skilled workers within its production line, is KME Steelworks Ltd, Northern Ireland. The company is a provider of precision subcontract fabrication services.

KME produce a vast range of components used in a number of industries, through the process of MIG welding. Historically this process had been solely undertaken by a human operative, though in a bid to continue to operate, when experiencing difficulties recruiting skilled staff, an automated robotic cell was implemented. After consultation with KUKA integrator

Baumat, the automation expert that develops welding cells for all manner of industrial applications, a design to KME's manufacturing requirements was agreed and executed.

Previously, materials were welded by hand and each cycle took between six and eight minutes. Having automated the manufacturing process, KME achieved cycle time savings of around 65 percent, a reduction of five minutes. Quality output was also a consideration when deciding to automate, which was maintained on each cycle.

Baumat worked closely with KME to identify the most suitable robot model that could undertake the welding requirements critical to its operational success and the KR6 R1820 from KUKA, designed specifically to operate within an arc welding application, was chosen.

A Fronius TPS 400i weld set was chosen as the end effector to power the MIG welding process. Utilising the latest KUKA software, the KUKA robot would stitch weld parts using 1 mm wire and the turntable has the capability of moving the part, in coordination, whilst parts can be loaded and unloaded during the cycle. Tip dressing and cleaning within the application can also be attended whilst the turntable is rotated, further supporting an increase in product output through improved cycle times.

In addition to the KUKA robot controller, the system was integrated with a touchscreen HMI (Human Machine Interface) connecting the operator to the real-time system information. Each aspect of the system can be scrutinised to ensure optimum performance and deliver a seamless manufacturing experience.

The system affords KME with



many benefits, notably the ability to continue to manufacture using a process into which it is finding it challenging to recruit. It is able to achieve significant cost savings through an increase in cycle time, resulting in increased product throughput, whilst maintaining a quality of output. It also enables KME to offer existing staff members the opportunity to learn new skills, training key personnel to become robot programmers and/or technicians.

There will always be a need for skilled labour, but the adoption of automated robotics can address the skills gap within manufacturing and provide opportunities for our millennials.

Robotics are being adopted more and more within what we would call traditional manufacturing processes. Technology has significantly changed the factory environment of even a generation ago. Modern manufacturing today requires an unparalleled degree of technical awareness, trouble shooting and problem-solving skills as new employees are instead required to manage, repair and programme automated systems. With staff upskilled and trained with new skills, it leaves the robot to do the work at a more consistent and productive level, making automation a better solution for all involved.

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Güdel's ArcTrack extends the operating range of FANUC welding robots

As a world leader in the manufacture of industrial robots, FANUC has an extensive product range spanning some 100 models. While this comprehensive range covers the majority of applications, there are instances where users need to extend the working range of a robot, as is the case in certain arc welding applications.

Güdel, renowned for its high-quality linear motion and gantry robot systems, has, in partnership with FANUC, developed the ArcTrack Robot Slide, a standard solution which can significantly increase the working range of FANUC's Arc Mate robots.

Güdel has configured this special ArcTrack TrackMotion slide in conjunction with FANUC to provide a flexible robotic welding package for their Arc Mate robots. The ArcTrack is available in lengths from 3 m to 30 m, can be extended at a later date if required, and is capable of speeds up to 120 m per minute.

This special module incorporates all of the features required for easy robot and

welding system integration, such as a standard platform for weld power supplies and quick cable connections. In keeping with all of Güdel's linear motion products, this new development retains the attributes of high precision repeatability, best in class rigidity and high motion performance. It makes the ArcTrack a robust and reliable solution that is highly resistant to dirt and dust and perfect for a busy industrial welding environment.

ArcTrack can be used with 4 different models of FANUC Arc Mate robot and is supplied directly via FANUC, as a package, together with the robot, fully configured and ready for use. This makes for easy integration of the welding equipment and subsequent installation on the customer site.

This particular unit is just one small part of Güdel's comprehensive TrackMotion Floor TMF range, which is available for many different 6-axis robot models and sizes and



capable of moving robots up to 13.5 tonnes in weight.

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Kawasaki Robotics (UK) Ltd

Cut costs without compromising quality

A common requirement in the construction sector is the production of H-section or I-section structural beams by joining three plates. Often the material will be rusty mill scale plate that has to be welded directly without any preparation. Cost pressures mean the welds must be made as quickly as possible and the need for rapid, trouble-free on-site assembly dictates that distortion and deformation are not acceptable.

ESAB was recently approached by a customer with exactly this requirement. In this case, a 10 mm x 470 mm web needed flanges to be attached along both edges. The flanges were 15 mm x 200 mm and one needed to be attached at an angle rather than being perpendicular to the web. At the time, the customer was using manual MIG welding with OK Autrod 12.51 copper-coated solid wire 1.2 mm diameter. With a wire feed speed of 7.2 m/min and a welding current of 240 Amps, the customer was achieving a welding speed of 30 cm/minute, which equates to 3.65 kg/hour and a predicted total welding time of 800 hours at a cost of €8.8 per metre.

Clearly some form of semi-automated welding would improve the situation and it might be thought that the obvious answer is to use the best technologies available, such as pulse welding that reduces heat input and therefore minimises distortion. However, this is still a relatively time-consuming process that would require two welding operatives.

ESAB's recommended approach was to 'think outside the box' and use a pair of Warrior 500i water-cooled machines, each with a Miggytrac B501 tractor unit and Coreweld 46 LS metal-cored welding wire 1.2 mm diameter. This enabled the rusty mill scale plate to be welded on both sides simultaneously to minimise distortion and deformation whilst still achieving the required throat thickness of a5 in a single run. Furthermore, a single operative can operate two Miggytrac systems concurrently, providing the customer with substantial cost savings.

With the setup described above, the wire feed speed was 16 m/minute and the welding current was 340 Amps at 36 Volts. This enabled the welding speed to be raised to 55 cm/minute, laying down 7.2 kg of weld metal per hour. As a result, the calculated welding time is better than halved, from 800

hours to 300 hours, and the cost per metre is similarly improved from €8.8 to €3.9 per metre. Most importantly, the reduced time and cost did not compromise quality as, despite the faster welding, there was no longitudinal deformation.

The recently introduced Warrior multi-process welding machine can perform MIG/MAG, flux-cored wire, Manual Metal Arc (MMA) and TIG welding tasks as well as arc gouging. Featuring highly reliable inverter technology for energy savings and greater functionality, the Warrior delivers up to 500 A at a 60 percent duty cycle. It welds 0.8 mm to 2.0 mm flux-cored, metal-cored and solid wires, carbon arc gouges with electrodes up to 10 mm diameter and has a full range of MMA capabilities. The Warrior machine incorporates ESAB's TrueArcVoltage technology to ensure the arc voltage is maintained accurately under all operating conditions to achieve higher-quality and more consistent welds. For this project, the Warrior was specified with the optional water-cooling unit.

ESAB's Miggytrac B501 and B5001 tractor unit for semi-automated straight-line arc welding is ideal for fabricating beams. Very compact, yet robust and capable of

producing high-quality welds, the Miggytrac B501 and B5001 incorporates a carriage travel speed from 0-130 cm/min, for the B501 and a 0-170 cm/min, for the B5001. They are quick and easy to set up with almost no learning curve. You can simply double your productivity with these universal battery-driven welding tractors that easily mechanise your GMAW process to meet real-world welding challenges. Innovative features such as programmable start and end sequences with back fill and crater fill and accurate programmable intermittent welding with the highest travel speed in the industry between welds, ensures high quality with the highest possible productivity, reliability, repeatability and efficiency.

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Reducing materials wastage and production time with rotary friction welding

The University of Strathclyde's Advanced Forming Research Centre (AFRC) is exploring innovative ways to reduce materials wastage and production time across UK manufacturing, using rotary friction welding.

Two rotary friction welding machines, the biggest of their kind in any UK research centre, are bringing a new capability to the centre. A welding process that benefits from enhanced integrity of materials, rotary friction welding is fast and highly energy efficient.

The AFRC's engineers and technicians will integrate this new capability with other advanced manufacturing techniques used at the centre, with big implications for industry. It is currently used across niche manufacturing areas within the aerospace and oil and gas sectors.

The AFRC, which is part of the UK's High Value Manufacturing (HVM) Catapult, is, however, seeking to change this and explore wider opportunities for rotary friction welding across various applications.

Originally housed in the Manufacturing Technology Centre (MTC) in Coventry, also

part of the HVM Catapult network, the 125 and 300 tonne machines represent an investment in the region of £500K. They will provide efficient, low cost solutions for firms requiring high integrity manufacturing processes in sectors, such as aerospace, automotive and oil and gas.

The centre has already received significant interest in its new rotary friction welding capability from within its network. One of the initial projects using the new equipment will see rotary friction welding used alongside other capabilities at the centre to develop a high performance, high integrity component for aerospace applications.

This combination of highly efficient manufacturing techniques will significantly reduce materials wastage and production time. Rotary friction welding is used to manufacture materials for high integrity, safety critical end products for the aerospace sector, modular shafts for gears within the automotive industry and components for the oil and gas industry.

Creating a 100 percent weld on the cross



section of parts within less than one minute, it's faster than any other welding process. One part is rotated at a high speed when pushed against another part to create friction, which results in heat. Coupled with an applied linear force, the heat generated provides the perfect conditions for welding of the two surfaces.

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ProtectoScan EDI

Exposure to environmental hazards in the workplace has always been difficult to monitor, but the ProtectoScan EDI from Extractability will change that.



Following the latest HSE safety alert, all welding activities now require effective controls for fumes which have been shown to cause lung cancer. This includes mild steel welding, which has been reclassified as a human carcinogen. Suitable fume control will also limit exposure to manganese, present in mild steel welding fume, as this can cause neurological effects similar to Parkinson's disease.

The ProtectoScan EDI can help and is an indoor Environmental Detection Instrument (EDI) that measures and records real-time data and is capable of switching on equipment once a pre-set level has been detected. EDI has an LED traffic light display, alerting users to any notable issues and providing an instant visual representation of what is going on in the workshop. EDI will also measure noise, temperature and humidity and is the perfect solution for monitoring and recording exposure levels, every second of the day, 365 days a year.

The ProtectoScan EDI is Extractability's boldest step yet to help employers monitor hazards from the workplace, stay within the regulations and improve health and safety among the workforce, creating a safe and clean workplace environment for everyone.

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New TIG welding torch technology

Lightweight tool allows easy manipulation of battery cans and tab materials

by James Tod, AMADA MIYACHI UK

Improving battery technology is necessary to respond to the global focus on EV (Electric Vehicle) technology. One way of improving battery pack performance is by replacing existing nickel battery tabs with copper material. Unfortunately, it has been difficult and/or expensive to weld copper using traditional methods. Now, a new touch retract TIG (Tungsten Inert Gas) welding technology has been developed that allows safer and easy manipulation of battery cans and tab materials in a bench-top, R&D (Research and Development) environment. Using typical prototype tooling, the system is especially suitable for R&D on battery pack concepts and assembly, low-medium volume battery pack manufacturing and battery pack repair/rework applications. Longer term uses include maritime, aviation, energy, and consumer goods.

Battery pack welding for EV market

Market analysis suggests that electric cars will cost the same as gasoline vehicles within eight years, pushing the global EV fleet to 530 million vehicles by 2040. About 90 gigawatt hours of EV lithium-ion battery manufacturing capacity is currently online and this is set to rise to 270 gigawatt hours by 2021.

Switching from nickel to copper tabs for battery connections can increase EV battery life by up to 20 percent, so manufacturers are looking for the most cost-effective technologies to do so. Available battery pack welding technologies include traditional resistance welding, laser welding and TIG welding.

Resistance welding is considered the standard for welding non-copper electrical components. Quick, simple, and very low cost, resistance welding has many benefits.

Unfortunately, copper is harder to resistance weld. Resistance welding relies on the inherent electrical resistance in a material to create heat, which melts the metal and creates the bond. Copper is conductive to electricity, so it does not generate much heat and what heat it does generate is largely directed away from the area.

Laser welding works well for welding copper to tabs, but it can be an expensive solution. In addition to the cost of the lasers themselves, tooling equipment is necessary to hold the parts firmly in place, because no mechanical force holds the parts together, tooling is required to ensure the proper contact before welding. The higher cost makes laser welding copper tabs best for high volume manufacturing factory production lines, not lower volume R&D applications.

Micro arc welding is a highly efficient method for generating localised heat. With TIG welding, the operator strikes an arc on an electrode. Operators point the electrode at the part to be welded and then use a high voltage to create a spark, similar to lightning, between the electrode and the material. That arc generates quite a bit of heat, which melts the material together and forms a strong bond. Due to the high voltage used, traditional TIG welding is safer and most effective in machines where there is no physical contact and when it is in the hands of a skilled operator who can control the arc gap. Using TIG welding in R&D applications, hand held assembly and low volume manufacturing presents health and safety problems. While those working in these settings may hold a PhD in battery science, they are not likely to be highly skilled TIG welders.

Recently, a new type of touch retract TIG



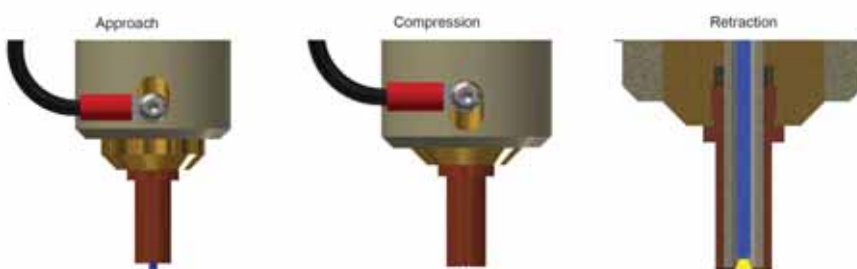
welding torch technology has been developed that does not involve physical contact. The electrode is pulled back with an electronic solenoid, eliminating the high voltage ignition and making it a lot safer and easier to use. The touch retract torch is extremely repeatable. It does not require maintaining a given distance, pulling back at the same distance every time. In effect, anyone can create a repeatable weld.

Advantages of the new TIG torch technology for battery pack welding

The new TR-T0016A touch retract torch manufactured by AMADA MIYACHI, was developed primarily for use in battery pack welding for EV applications, in which hundreds of small cells are welded together into modules. In the past, nickel bus bars were used to join up positive and negative terminals, but new designs are seeking to join copper strips to the battery can. The new touch retract TIG torch welder offers effective welding of copper with relative ease compared to traditional resistance welding techniques.

For hand assembly, touch retract starting is a safer method than high voltage. It also costs less than a typical laser system.

For example, major global automobile manufacturers seeking to weld their own battery packs may opt for a robotic laser system that costs about half a million dollars



and is used in an automated production line, but for those looking to conduct rapid evaluation of battery pack designs or other R&D work and for production of small volume prototypes, small to medium scale battery pack repair or rework, or even Formula 1 racing teams, the hand-held touch retract TIG torch welder is an attractive solution that works well. It can also be a tool for investigating and fixing process issues. Rather than simply disposing of parts, the touch retract torch can be used to fix loose joints.

The flexible nature of the retractable TIG torch allows concepts to be quickly manufactured and tested so it fits well with R&D organisations working on the evaluation and production process design of their battery pack concepts. The technology offers a high repeatability rate with one weld per second. It also has a narrow, 7 mm nozzle and protruding electrode for better weld location control.

While designed for hand use, the touch retract TIG torch can be incorporated into an automated manufacturing line, so it would be appropriate for low-medium volume production applications. For example, it would be a good option for



university spinoffs that have done R&D and are now looking to scale up production and require the repeatability of an automated machine.

The new system has been extensively tested for welding typical battery tab materials, copper, nickel, and aluminium, up to a thickness of 0.5 mm onto 18650 and 21700 battery can material. It can also be

used to join other metals, including stainless steel, gold plated stainless steel and many others.

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WeldEye mobile application enhances welding quality

Kemppi has launched a new mobile application for its universal welding management software, WeldEye. The application acts as a mobile user interface for the Cloud-based software and offers a new set of Industry 4.0 tools for welding professionals to manage welding quality, production processes, and productivity in a more efficient way.

The connection between the WeldEye app and welding equipment is established with a digital connectivity module that collects welding data and enables a wireless data transfer via Bluetooth. The app then uploads the data into the WeldEye cloud service via Wi-Fi, or mobile network which is especially helpful when welding in areas where Wi-Fi is not available.

The app can also be used only for browsing welding procedure specifications.

Vesa Tiilikka, Kemppi's product manager for software, comments: "The welders can easily access their company's WPS library with their mobile phones. They can also receive digital work orders, report work progress and get feedback on their welds,

including heat input values when welding data is collected.

Juhana Enqvist, Kemppi's CDO, adds: "Paperless production becomes a reality with WeldEye. The new digital work order functionality, WPS accessibility on the go and WeldEye's real-time integration APIs to companies' ERP/MES systems bring Industry 4.0 closer to our customers."

The collection of digital welding data, and verification against digitally stored WPSs has many benefits. Real-time quality control decreases costs and improves productivity, as any quality deviations can be identified and fixed without delay. Early intervention on any welding deviations can bring significant cost savings. In addition, companies with global manufacturing and supplies can be sure that they meet the requirements of different welding standards and global sales.

Vesa Tiilikka says: "Digital solutions are constantly gaining ground in the welding industry because of their huge potential. Nobody wants poor welding quality and only by monitoring compliance with welding



standards can we be sure that the welds around us are risk-free and of high quality. WeldEye provides an easy way of doing just that, now also with your mobile phone."

The WeldEye app is available for download free of charge on mobile devices with Android 6.0 or above from Google Play. Its use requires an active Kemppi WeldEye account.

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Software for laser cutting and bending produces right-first-time parts

Holmfirth-based sheet metal design and engineering specialists, Allsops Ltd has progressed from CO₂ to fibre laser cutting, resulting in significant financial savings for the company. Mild steel from 1.2 to 3 mm thick is mainly processed and for these gauges, even up to 6 mm, the production output from each of two Bystronic fibre laser machines is at least three times that of the previous CO₂ models they replaced, added to which running costs are much lower.

Furthermore, during 2018 the subcontractor upgraded its bending capability with the addition of two Xpert 40 Bystronic press brakes with a bending length of one metre and a stroke of 200 mm. Raising the number of press brakes on site from this supplier and predecessor companies to 11, they provide a much more efficient platform for bending smaller parts than is possible using a 3 m capacity machine, which necessarily has slower axis movements.

File to part is quick and accurate

Further benefits come from Allsop's use of the Swiss manufacturer's BySoft 7 software to program both the fibre laser cutting machines and the new press brakes. It results in seamless, rapid progression from cutting the blank to bending and guarantees accuracy of the first-off part. This is invaluable for economy of production when dealing with prototypes and short runs. The software includes simulation of the bending sequence to identify any impending collisions.



Allsop's technical director, Stephane Lericolais, says: "We previously used generic programming software for laser cutting and bending, but since 2010 we have standardised on BySoft 7. It imports our customers' 3-D CAD models, flattens them and automatically generates programs offline for cutting the parts, nesting them optimally within a 3 x 1.5 m sheet and then bending them accurately.

"We know that the first part will be within tolerance whereas previously, before producing a prototype or starting a batch run, we would have to cut a blank, calculate the bend allowance, fold the part, check it for accuracy and have to do the same again perhaps once or twice before the job was

right. All of this created expensive scrap and took much longer."

Not only is production able to start more quickly on the compact Xpert 40 press brakes, but the machines are also highly efficient, according to Allsop's production director, Lyndon Tyas.

He comments: "With these inherently fast bending cells, all of the upper and lower tooling is to hand in drawers on the left and right hand sides of the machine and the operator can remain seated when loading them.

"Tool positions are automatically calculated as a part of the program and flashing LEDs on the front of the upper beam instruct the operator where to mount the tool segments.

"The ergonomic configuration means that setting up the machine is rapid, typically 15 minutes for a straightforward part. Accuracy is high, we easily hold ± 0.5 mm, more than good enough for most jobs and we can even halve that tolerance if required."

He also pointed out that there is space to hold cut blanks on one side of the machine and components that have been bent on the other. Another feature is the ByVision touch-screen control, which can be conveniently positioned to one side at the operator's eye level, or just above it centrally if preferred.



24/7 production no longer needed

Allsop has been a customer of Bystronic or its acquired companies for more than 20 years and there is little sheet metal processing equipment on the Holmfirth site, apart from a bending line and a punch press, that have not been sourced from this supplier. While thinner gauges of mild steel constitute a majority of the material going through the machines, plate up to 25 mm thick is also cut as well as stainless steel and aluminium up to 30 mm.

The subcontractor was an early adopter of CO₂ laser cutting, installing its first model back in 1995. Latterly there were two such machines on the shop floor with a 4.4 kW and 5.2 kW laser source respectively. They were replaced in 2015 and 2016 by a BySprint Fiber and a ByStar Fiber, both of 6 kW specification and of 3 m by 1.5 m sheet capacity. The machines are supplied with material from ByTrans handling units that were formerly fitted to the CO₂ machines, enabling automated delivery of fresh sheets to the machines and return of laser profiled components for removal from their skeleton.

Allsop's is yet another good example of where fibre cutting has massively increased productivity compared with CO₂, in this case typically threefold. Managing director Rob Machon and his team had been keeping an eye on the advent of the technology and had watched the introduction of machines with 2, 3 and then 4 kW of fibre laser power, but decided to wait until 6 kW became available before making the first investment.

If the BySprint model was a revelation in terms of increased throughput, the ByStar installed the following year raised performance significantly further. Due to faster axis movements and higher dynamics compared with the earlier fibre machine, some sheets are processed 30 percent faster if components are complex, while for the simplest jobs there is still an improvement of nearly 10 percent.

Together, the machines are so productive that to achieve the required throughput, it is no longer necessary to run the factory 24/7, leading to significant labour cost savings. Currently, only a night shift is needed four days

per week and there is no longer a necessity for weekend working. At the end of Friday afternoon, the two ByTrans are loaded with material, which provides both machines with a couple of hours' lights-out running for processing the following Monday morning.

Stephane Lericolais advised that further savings result from there no longer being a need for any laser gas or beam purging gas, while assist gas usage per cut component is 37 percent less. Additionally, electricity bills have reduced by a similar amount, unsurprising as CO₂ technology requires 98 kW of input power to generate 6 kW of laser power at the cutting nozzle.



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Flexible laser welding lends a helping hand to automotive and press tool rework

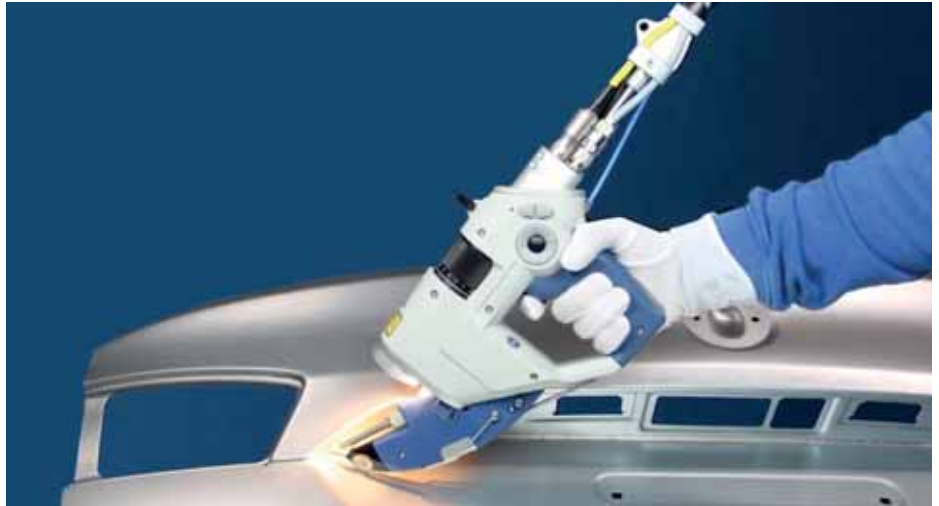
The AL-ARM hand held laser system from ALPHALASER enables quick and easy repairs on vehicle body-in-white defects such as porosity, bleed-through and offset seams. Alternatively, for prestool applications, welding can be performed directly inside the press with the minimum of setup time. These are just two application areas that can make use of this highly flexible tool.

The laser system comprises of a handset with automated wire feeding for wire thicknesses up to 0.6 mm. The handset weighs just 1.5 kg and is connected to the supply unit via a 3.5 m long energy chain. The laser source is a 450 W fibre laser, 1,070 Nm, with both pulsed and CW operating modes, capable of delivering a welding spot size of between 0.3 mm and 4.0 mm at a focal distance of 120 mm.

The welding process is monitored through a 3D visualisation as opposed to the traditional microscope viewing technique. This is achieved using 3D laser protection goggles, which allows the user to monitor both the environment and the welding process at the same time. The welding area view is augmented and process-relevant data, such as the cross hairs, is displayed directly to the operator.

The lightweight handset is easily manipulated, allowing the highest levels of flexibility during operation and the welding seam width can be varied and adjusted during the welding process as required. This combination of flexibility together with the quality and control of the laser welding process, have been the drivers for the introduction of this system within a prestige European automotive manufacturer, where it is used to make minor repairs to body-in-white panels.

The compact nature of this system also makes it possible to undertake repairs to mould tools, whilst they are still installed within the press. This saves the significant amount of time normally required to remove and then replace the tools following repair. Great emphasis has also been placed on safety for this system. Integrated workpiece detection ensures that the laser and the welding process can only be activated when the handset is touching the workpiece,



preventing uncontrolled laser radiation emissions. This safety concept has been verified by TÜV for compliance with the highest levels of safety requirements.

This highly flexible hand held laser welding system is now available from Bromsgrove based TLM Laser, ALPHALASER's UK and Ireland distributors, complementing the comprehensive range of laser based technologies and systems offered by the company.

Founded in January 2006, TLM Laser Ltd is a dedicated laser service company, providing a second to none service and maintenance program which it can implement to best suit its growing customer demands.

Located regionally throughout the UK, it provides a quick and efficient service whether it be a preventative maintenance contract or emergency breakdown cover. Its highly trained and experienced engineers have vast experience on a complete range of lasers. From lamp pumped lasers to diode pumped or CO₂, the company will endeavour to maintain and extend its growing reputation at the forefront of the laser servicing and repair industry by carrying out scheduled maintenance visits as well as providing call out cover.

It appreciates, in a high production environment, the requirement to minimise downtime. Its large stock of spare parts allows its engineers to be committed to putting customers first. Whatever your industry sector, TLM Laser will meet your requirements first time every time. As well as



providing a quick and efficient service to its customers.

TLM Laser also supplies a wide range of laser safety equipment, spare parts, fume extraction, chillers, training, consultancy and subcontract laser marking. It also stocks a varied range of second-hand laser systems which are available in "as is" or fully refurbished condition.

Initially providing a total laser maintenance service, the company now offers a complete range of laser products from some of the leading names in laser technology.

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TRUMPF entry-level fibre laser boosts revenue at start-up

New start-up Staffs Laser Ltd has selected a TRUMPF TruLaser 2030 fiber to help propel the business into the Midlands subcontract sheet profiling market. Installed at the time the business was launched, in April 2018 as the company's sole laser cutter, the TruLaser 2030 fiber is on target to help Staffs Laser achieve a turnover of £800,000 in its first year of trading, way ahead of the £560,000 originally budgeted.

Staffs Laser is the brainchild of Eddie Hopkins, who has been working in the laser cutting arena for the past 15 years.

He explains: "At my previous employment we had CO₂ laser cutting machines, which are fine but cannot match the speed of fibre on thinner sheet. My old bosses were reluctant to invest in the latest fibre technology, so I decided to leave and start my own business."

Working out of premises near Stone, ideally located between Stafford and Stoke, Eddie Hopkins knew he would have to invest from the outset and TRUMPF was always going to be first choice.

He continues: "I knew TRUMPF machines well and consider them to be the market leader. In addition, they provide really good service, which I knew would be key to a new start-up business like mine."

With limited budget, Eddie Hopkins enquired about TRUMPF's entry-level machine, the TruLaser 2030 fiber, which is designed to provide an easy introduction to highly productive laser cutting. Importantly, machine operation is intuitive so users can get started immediately and continuously benefit from system performance. The TruLaser 2030 fiber can cut a range of materials, from mild steel, stainless steel and aluminium, all the way through to copper and brass, with the renowned 'fibre' edge quality. It has a bed size is 3 m x 1.5m.

Eddie Hopkins says: "We cut mild steel up to 20 mm, stainless steel up to 16 mm and aluminium up to 12 mm. We also process copper, brass, galvanised steel and zintec. For thinner sheet we cut with filtered compressed air."

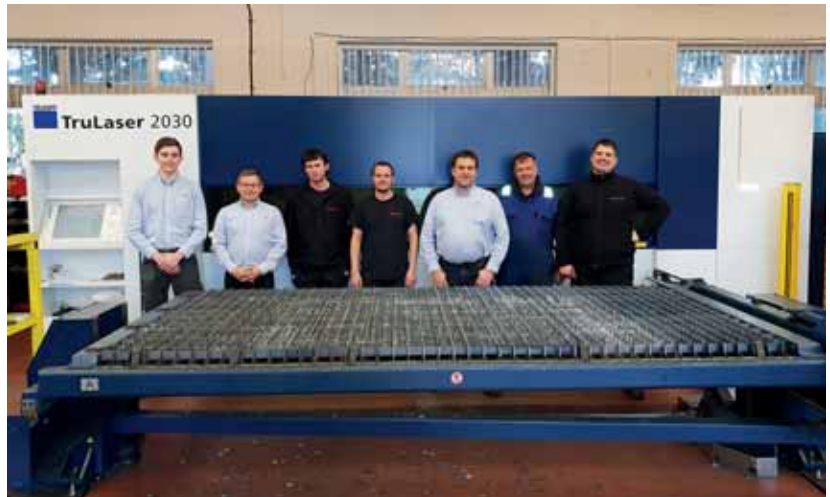
Staffs Laser has already created a strong client base in sectors such as construction, yellow goods and street furniture, supporting its laser cutting abilities with folding, welding and general fabrication services. In addition, the company can offer value-added resources that include design and reverse engineering.

Eddie Hopkins adds: "Such has been the ramp up in demand, the TRUMPF TruLaser 2030 is already running 12 hours a day during the week and 6-7 hours on Saturday. In fact, we are struggling to keep up and will soon have to consider running overnight."

In August 2018, the company achieved a record monthly revenue of £80,000, which is nearly double the £45,000 that was originally budgeted.

Eddie Hopkins states: "There is no doubt of the influence that fibre technology has had on our business performance. Features such as single-head cutting are a massive plus in terms of maximising uptime."

He concludes: "We are already getting a reputation for our speed of turnaround. This is matched with A1 cut quality and good prices, we have low overheads as there are only seven of us here at the



moment. Moving forward, our aim is to continue taking market share through a strategy of 100 percent customer satisfaction and ongoing investment in the latest manufacturing technologies."

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Focused and diverse range of bending and forming for hydraulics

The highly dynamic stress on hydraulics tubing and connections needs technology that delivers clean, robust and long-term tight results. Engineering company transfluid has been developing tube bending machines for the past 30 years to produce these results and the solutions for these demanding specifications are more and more advanced. They go from simple bending machines that bend directly on the equipment, to CNC controlled bending machines. Cutting ring pre-assembly machines are available for connections in hydraulics and also forming machines, to add DKOL and other soft sealing connections and hose fittings directly on the tube, as well as forming a single-piece tube fitting on the tube, with no chips.

With simple and effective techniques, little space required, sometimes just one m² and great flexibility in the applications, transfluid has developed the latest generation of its classic mobile bending machine t bend MB 642 for bending directly on site. With this machine it is possible to bend tube up to 6 m long on-site and the floor space needed by the machine does not change. This is because the rotating head can turn and reduces the working space needed to a minimum. With the compression bending technique, the MB 642 can bend tubes with a diameter between 6-42 mm and the operation is simple. The bending radius can be relatively tight in this case, between 2-2.5 x the diameter of the tube and 3 x with tube with very thin-walled tubes.

Extra equipment is available in the form of internal and external deburring devices,

saws and assembly devices for all of the most common connection systems, flange and with cutting ring for thread cutting, as well as metal circular saws.

For the manufacturing of tube geometries, for individual pieces or small series with rotary draw bending, transfluid has developed its compact bending machines with mandrel. They are very flexible and can achieve a very tight bending radius, even with tubes with thin walls when bending with a mandrel. This means that the t bend DB 2076K machine can work with tubes with a diameter of 20-76 mm. If needed, it is possible to transfer data to the machine with a USB connection. The control system can store whole bending programs and the machine comes with an 8-angle pre-selection as standard. In this case, there is optional equipment such as saws, burring devices, cutting ring for threads and flanges, to manufacture complete tubing systems for the individual needs.

As well as tubing and connections for hydraulic applications, there is more and more often the need to process CAD data from different programs or to manufacture complex tubing systems. transfluid makes this possible with CNC machines that perform strongly, are simple to use and completely automated. The tools can be exchanged quickly, making their use extremely flexible. Because of the price/performance ratios, they are ideal for small production runs and for applications with high geometry diversity. These bending machines work independent of the user and



to the specifications of the individual project. This is possible thanks to the interfaces available to connect them with CAD and measuring machines.

transfluid created its own software, t project, to improve the processes and safety of the production. The two versions provide controlled tube manufacturing and connect the machines to CAD and measuring systems, BDE or ERP systems. It makes the use of CNC bending machines or bending robots more flexible. For instance, it is possible to test bending sequences in advance, make sure that there are no collisions and execute them. Various additional modules contain the information for whole sequences, to have better control over the process and to manage the forming process data. The software also helps at the cutting stage, reducing any waste to the minimum.

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Crescent machinery expands machine guarding service

Crescent Machinery, a Group Rhodes company which provides service and maintenance for all types of sheet metal and folding machinery, has expanded its machine guarding and PUWER (Provision and Use of Work Equipment Regulations) assessment service.

The company has responded to an increasing demand in the market, for specialist guarding for all machine tools to ensure companies remain compliant with PUWER regulations. Crescent Machinery was acquired by Group Rhodes in 2017 and the company is now able to offer the latest 3D AutoDesk Inventor, to enable customers to visualise exactly what their machine guarding would look like. This has also resulted in Crescent Machinery securing a number of contract opportunities with government bodies, as well as major manufacturers in the private sector.

Steve Jackson, technical sales manager at Crescent Machinery, explains: "In today's manufacturing operations, it is essential to ensure that all employees are protected and can operate in a safe and healthy working environment. We provide a complete

service ranging from an initial assessment of existing equipment, to designing and manufacturing guarding to ensure the company complies with PUWER legislation. This includes providing bespoke machine guarding solutions for equipment large and small."

According to PUWER regulations, businesses must take effective measures to prevent access to dangerous parts of machinery in order to minimise risks. This normally means that guarding needs to be in place which prevents a worker from being in contact with dangerous moving parts. Under PUWER regulations, inspection of machinery should be carried out by a trained and fully competent person to ensure it is correctly installed and does not deteriorate. It also requires operatives to have received adequate training and instruction on use of the equipment.

Crescent Machinery's assessment service means its specialists can identify hazards and items that can cause harm. The company provides risk reduction solutions to ensure all types of machinery complies with PUWER legislation, with minimum



impact on operational efficiency and productivity.

The Corporate Manslaughter and Corporate Homicide Act, introduced back in 2007, meant that, for the first time, organisations could be found guilty of corporate manslaughter as a result of management failure, resulting in a gross breach of their duty of care. Businesses are therefore recognising how vitally important it is to protect their staff and to reduce their own risk.

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II-VI Incorporated unveils highly flexible laser materials processing head

II-VI Incorporated, a leader in laser materials processing solutions, has announced the introduction of its HIGHmodular processing head. This highly flexible product is typically used for laser welding and is designed with an embedded control unit that can be programmed through a graphical user interface.

The range of laser-based materials processing options is expanding and this is driving the demand for highly versatile processing heads that achieve high productivity and process quality at a very low cost of ownership. II-VI's HIGHmodular offers the ultimate in flexibility for focus control with an integrated 1D scanner, zoom collimation and a broad array of optics expansion modules. These features enable a near-limitless range of highly optimised laser welding tasks including battery welding for the automotive industry.

Dr Robert Kuba, managing director at II-VI HIGHYAG, says: "The HIGHmodular's ability to continuously adjust the focus diameter and position on the fly, not only from one workpiece to the next but also during the joining process, takes software-controlled

welding to a whole new level of flexibility and productivity. The HIGHmodular is a perfect match for industrial lasers of up to 10 kW and delivers industry-leading weld quality in a broad range of materials including aluminum, copper and steel."

The integrated 1D scanner and zoom collimation allow the continuous adjustment of focus diameter, M, focus position, Z, at a focal length of 50 to 120 mm and with an extremely generous Z working range of 40 mm. Both the 1D scanner and zoom collimation are controlled by an intuitive graphical user interface. II-VI's broad portfolio of products for laser-based materials processing includes laser processing heads for cutting, welding and brazing as well as laser light cables and direct diode laser engines.

II-VI Incorporated, a leader in engineered materials and optoelectronic components, is a vertically integrated manufacturing company that develops innovative products



for diversified applications in the industrial, optical communications, military, life sciences, semiconductor equipment, and consumer markets. Headquartered in Saxonburg, Pennsylvania, the company has research and development, manufacturing, sales, service, and distribution facilities worldwide.

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Efficient sawing in the cutting range up to 1,060 mm

Since its inception, in 1919 in Kirchartdt, Germany, Behringer has proven to be a real innovation specialist. As one of just a few complete providers in the sawing technology market, the company offers both bandsaw and circular saw machines as well as machine tools for the steel construction industry.

With the HBE performance series, which sits alongside the HBE Dynamic series, Behringer is offering a particularly robust and powerful product line which can especially hold its own in harsh environments. Behringer is now extending this series with the largest model, the HBE1060A Performance.

With a cutting range of 1,060 mm in round stock and 1,060 x 1,060 mm for square material, the HBE1060A Performance can be used for a wide range of applications, such as those found in the steel distribution, machine building and toolmaking or in steel finishing.

From bar steel or solid materials made of non-ferrous metals, to plastics, slabs, large pipes or profiles, the HBE1060A Performance covers a wide range of applications. Just like the smaller models in the series, HBE663A and HBE860A, it offers impressive features which significantly improve process reliability during sawing.

The HBE series is controlled via the user-friendly and easy-to-use BT65 touch control which provides maximum support to the user as they work. Once the material to be sawn has been selected from the extensive database, the auto feed control, which comes as standard, provides all the necessary technological values for the cutting speed and the servo-controlled feed. Together with the cutting pressure control, which detects the cutting force on the back of the bandsaw blade, the cutting parameters are continuously adjusted in line with the current status of the bandsaw blade, thereby providing effective protection against overload.

When it comes to sawing large diameters at slow feed speeds, the HBE1060A Performance servo feed system really excels compared to hydraulic systems. The steady feed movement provided by the ball screw



spindle and servo motor provides constant chip removal and helps ensure a quiet and stable cutting process. This results in a machine with high cutting capacity and blade service life.

Behringer uses self-produced vibration-dampening cast parts where it makes structural sense to do so. The sawing unit, supported by a torsion-resistant gantry structure, features bilateral double-wheel support. So, not only does the HBE1060A Performance impress with its extremely quiet running, precise cuts and gentle operation in regard to the bandsaw blade, it also delivers maximum quality. The inclined position of the band wheels also helps protect the bandsaw blades as a result of reduced flexural stress. Thanks to its automatic guide arm, the bandsaw blade is always guided close to the cutting point, which is extremely convenient when it comes to handling frequently changing material cross sections.

Rising energy prices mean that companies are rethinking their existing processes and drawing on technological innovations to develop new solutions for achieving greater output with less energy input.

In the HBE1060A Performance, Behringer has opted for a wide chip conveyor with integrated coolant tank which is located under the funnel-shaped machine stand. Chips and coolant are thus reliably fed to the conveyor and the conveyor can be easily

moved out of the machine for cleaning purposes. The ejection height of 800 mm means that large chip containers can be used.

Even the bandsaw cleaning of the HBE1060A Performance has been taken to the next level. An electrically-powered brush effectively cleans away any chips that have adhered to the bandsaw blade. The quick-change device allows users to quickly change worn brushes without the need for any tools.

The new full enclosure for the machine not only fulfils current CE directives, it also meets the growing demand for user-friendliness, occupational health and safety and environmental protection. The benefits are self-evident: a clean working environment and noise reduction combined with an optimal view into the machine. The maintenance-friendly concept enables easy bandsaw blade changeover without tools and excellent accessibility for maintenance or cleaning work.

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Hypertherm introduces new consumable kits for XPR cutting systems

Hypertherm, a manufacturer of industrial cutting systems and software, is shipping consumable kits for its XPR X-Definition™ Plasma systems. These new consumable starter kits are available with or without a torch for mild steel and nonferrous cutting applications. The kits include a variety of consumables to allow for cutting at different amperages, using all of the gas process types supported by the XPR170™ and XPR300™ systems.

The consumables contain several patent pending technologies to improve consumable life and cut quality. Examples include; Cool nozzle™ and Arc response technology™, the latter of which protects consumables from the negative impact of ramp down errors, a regular occurrence in real-life cutting. By reducing the impact of ramp down errors, XPR consumables can last up to three times longer than those on older generation systems.

In addition, XPR consumables are designed with ease-of-use in mind. An EasyConnect™ feature allows operators to quickly plug the torch lead into the torch

connect console without the use of tools, while a patent pending QuickLock™ electrode delivers easy quarter turn tightening to further reduce setup time. Another new design feature is a quick-change torch that enables an operator to rapidly change torches with just one hand.

Martin Geheran, product manager for plasma torches and consumables, says: "Whether you are cutting mild steel, stainless steel, or aluminum, these new starter kits will make it easy for XPR customers to get all of the consumables they need in one convenient kit. We think customers will also enjoy the convenience of the kits that come with a torch, as it will give them the option of having a second torch, or even multiple torches, pre-loaded with consumables for even faster change-outs."

Hypertherm®

Hypertherm designs and manufactures industrial cutting products for use in a variety of industries such as shipbuilding, manufacturing, and automotive repair. Its product line includes cutting systems, in addition to CNC motion and height controls, CAM nesting software, robotic software and consumables. Hypertherm systems are trusted for performance and reliability that result in increased productivity and profitability for hundreds of thousands of businesses. The company's reputation for cutting innovation dates back 50 years to 1968, with Hypertherm's invention of water injection plasma cutting.

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Specialist cutting service using heavy-duty bandsaws

Specialist, heavy-duty vertical band saws, used by Accurate Cutting Services, produce substantial economies by profiling blanks to remove excess material in bulk, prior to machining.

The removal of the excess material can substantially reduce machining time and tooling costs. Using a band-saw blade, less material is turned into swarf or chippings, 2 mm or 3 mm kerf loss being typical and the offcuts are available for use or for sale as prime stock rather than scrap. No heat-affected zones are created in the product by this cold-cutting process.

Cutting up to 25 tonnes with diameters of

6,000 mm x 1,000 mm or 1,800 mm, the company believes these band saws to be the largest of their kind available for subcontract cutting in the UK.

Increasing the capacity to 1,060 x 6,000 x 2,000 for a single cut and by shunting the material up to the saw, much greater lengths of cut can be accommodated. The table is fully filled-in with I-beam section, providing a flat surface on which to set any object, casting, fabrication, beam, block or plate regardless of irregular shapes.

To aid in the accurate cutting of materials to lines and markings, the saws are fitted with laser light guides. This ensures accurate positioning of the material relative to the blade and enables continuous monitoring of the blade progress, reducing the risk of blade run-offs.

Sections of up to 1,800 mm square or diameter can be sawn to any length.

Today, after nearly 50 years of sawing, Accurate Cutting Services Ltd is still a private family owned business, but has increased in size and scope through the acquisition of Birkett Cutmaster Ltd. Now operating from two main sites, Redditch in



Worcestershire and Cleckheaton in Yorkshire, it can offer faster response to customer needs in machine servicing and repairs and a new larger portfolio of products for UK distribution.

With knowledge and skills acquired over nearly 50 years of service to industry and by investing in locations best suited to customers, Accurate Cutting Services has earned an enviable reputation as a technical partner to leading UK manufacturers.

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Nickel alloys cut three times faster

The Howat Group, a specialist stockholder serving the oil and gas industry, perhaps better known by its trading names AMS, ESS and Ancon, has installed a 14th Kasto bandsaw, a KASTOwin pro AC 5.6, at its new centre in Barnsley which opened at the end of 2018.

The facility represents an investment of more than £2 million by owner Malcolm Howat and has been timed to coincide with the oil and gas sector's nascent emergence from a downturn that started in 2014.

Half of the sum went on acquiring a freehold, 60,000 sq m property on Cortonwood Drive in the Dearne Valley area of the city. The remainder was spent on infrastructure, materials handling equipment, two further Kasto bandsaws and refurbishment of all the older models, some of which have been in service since the 1990s and still cut accurately.

The German-built KASTOwin pro, supplied ex-stock from the manufacturer's UK subsidiary in Milton Keynes, is a competitively priced machine designed for cutting tough nickel, titanium and stainless-steel alloys up to 560 mm in diameter using a tungsten carbide-tipped (TCT) blade. However, the machine also allows economical cutting of low alloy steels when the blade is swapped for a high-speed steel (HSS) bi-metal type.

Emma Parkinson, operations director at Howat's, says: "We have four dedicated carbide cutting bandsaws on site which include KASTOtec AC5s and now the KASTOwin pro, which is even more capable. They are ideal for cutting our Inconel 625, 718, 725, 825, 925 and K500 stock.

"The latest investment was to increase our overall cutting capacity but also to improve efficiencies around nickel alloy cutting specifically.

"The remainder of our sawing plant, with capacities up to 800 mm diameter, are intended for bi-metal cutting but can also use TCT blades with offset teeth.

"The advantage of the latest KASTOwin pro saw, apart from its ability to use either type of blade economically, is its high productivity, which is down to fast cutting speeds and quick setup using the new touch-screen control."

Programming is fast with the Kasto EasyControl, as cutting parameters for any given material, size and cross section are



determined automatically by a built-in database, so all that is needed is to enter the cut length and number of pieces required and press start.

The productivity benefit is most pronounced when cutting nickel alloys. Formerly, the company was sawing Inconel 718 with a TCT blade at 3 to 4 cm² per minute, but on the KASTOwin pro that has risen to an average of 12 cm² per minute. So, for example, a 200 mm diameter bar that would previously have taken up to an hour and a half to cut can now be processed in less than half an hour.

Emma Parkinson explained that she was familiar with the benefits of the latest German-built bandsaws compared with the performance of the legacy machines, having worked with this make of saw when previously employed at another stockholding company nearby.

So, the Howat Group needed more capacity to cope with an increasing number of high-volume orders both for nickel alloy billet and for low alloy steels, the KASTOwin pro was a logical choice. The large batch sizes make it economical to spend time changing from an expensive TCT blade to

bi-metal to extend the life of the tungsten carbide tipped teeth.

A feature of the automatic KASTOwin pro is its innovative, electro-mechanical downfeed via by two ballscrews, each with a servo drive for precise, infinitely variable control. The positive motion allows smaller tolerances to be set, typically -0 / + 0.5 mm for most stock, minimising material wastage. There is a retraction unit for separating the blade from the material to protect the cut surface when the saw head moves back, which also helps to minimise tool wear.

The band is driven by an 11-kW motor, delivering infinitely adjustable cutting speeds from 12 to 150 m/min and providing plenty of capacity for TCT sawing.

Partly due to the larger orders being received and also the high value of nickel-based metals, the monthly turnover of Howat Group trebled within a few months of the stockholder opening its new facility.

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