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'Cutting edge' at the heart of FANUC's new ROBOCUT series

FANUC UK has unveiled the latest additions to its ROBOCUT range of wire EDM robots, the α-C400iC and α-C600iC

The compact new models build on their predecessors, incorporating an updated casting design for greater rigidity, stability and accuracy. Offering unparalleled levels of speed and accuracy in metal fabrication by way of carefully controlled rapid current discharges, the α-C400iC has a footprint of just 1,970 x 2,120 mm, while the α-C600iC stands at 2,070 x 2,650 mm.

The α-C400iC is able to process workpieces of up to 500 kg with an X/Y/Z-axis capacity of up to 730 x 630 x 250 mm, offering significant versatility for a number of applications. The α-C600iC can handle workpieces up to 1,000 kg and 1,050 x 820 x 300 m, making it ideal for larger projects. The Z-axis of the α-C600iC can also be extended to 400 mm on request, to facilitate working with particularly thick workpieces.

Consistent, high-precision cutting is achieved thanks to the taper adjustment function, even when working on complex stepped or contoured workpieces. The ROBOCUT CCR rotating table also opens up new opportunities, offering a dynamic work surface with genuine stability that provides well-needed flexibility to the cutting process.

Both the α-C400iC and α-C600iC come with the option for FANUC Auto3D software as standard, which measures inclination and rotation without the need for additional 3D processing software. Moreover, AI thermal displacement compensation allows easy adjustments to be made to the procedure at the operator's convenience. Smooth or mirrored finishes can also be applied to workpieces without the need to transfer components to another machine.

To ensure as little downtime as possible, the Automatic Wire Feeding function (AWF3) minimises wire break-related downtime, rethreading in as little as 10 seconds if a break does occur.

The range supports up to 140 hours of unmanned machining, meaning parts can be prepared over the weekend ready for assembly in the week. All ROBOCUT machines come with LINKi as standard, an easy-to-use graphical interface capable of monitoring up to 32 machines in real time. In conjunction with the high levels of speed and accuracy achieved by the α-C400iC and α-C600iC, LINKi helps to streamline automation of the entire fabrication processes.

All ROBOCUT machines can be customised with a number of accessories and software to further enhance productivity in the desired sector.

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See more page 24...

ETG strikes technology partnership with Winbro

The Engineering Technology Group (ETG) has announced that it has signed a technology partnership with world-leading machine tool manufacturer Winbro Group Technologies. The new agreement between the UK and Ireland's leading machine tool solution providers will streamline and enhance the route to market and accessibility of technology that is continually breaking boundaries.

Winbro Group Technologies is a leader in the design and manufacture of advanced machines and technologies based on non-conventional processes. Winbro Group Technologies offers a comprehensive range of high technology machining systems that have a distinguished pedigree in the production of cooling holes and other forms and features in turbine components. This has earned Winbro Group Technologies an enviable reputation in the aerospace, industrial gas turbine and power generation sectors, providing machines with unique capabilities to these industries. However, as a company that is continually pushing the pace of technology evolution, Winbro is now making significant inroads by applying its unique IPR to new sectors such as electronics and medical devices. Winbro non-conventional machining processes include high-speed EDM drilling, laser drilling, cutting & ablation, creep feed grinding and Electro Chemical Machining (ECM) that are increasingly suitable for the medical, electronics and electric vehicle and battery technology sectors.

Commenting upon the newly formed relationship, ETG's group managing director, Martin Doyle says: "This new partnership will benefit both parties hugely. Winbro is pushing the envelope on next-generation technology that can be applied to a vast range of applications and industry sectors, delivering high-quality machine tools beyond anything else in the market. They are the machines of choice for critical components in the aerospace industry.

"ETG delivers sales, service, support and integration and its expertise in turnkeys and process development will further enhance the UK's high-technology manufacturing base. By forming this partnership, ETG will identify opportunities whereby manufacturers across the entire spectrum can benefit from investing in Winbro

machine tools. ETG and Winbro, as part of the sales process, can demo pre-production processes at the facility in Shepshed. The ETG team is excited for the opportunity to work with one of the key UK manufacturers of machine tools and once again promote and support the UK manufactured brand."

Adding to this, Winbro Group Technologies' chief commercial officer Andy Lawson says: "We are delighted to form this partnership with ETG, which is an ideal marriage of Winbro's world-leading technology in non-conventional machining and ETG's broad base across many industrial sectors. Wherever ETG's customers have a problem that cannot be addressed with conventional machines, Winbro can potentially offer a solution."

Winbro Group Technologies has a manufacturing and assembly facility in Coalville with another facility in Rock Hill, SC, USA where machine systems can be configured either as a single process or dual complimentary process machines.

Winbro Advanced Machining (WAM) is Winbro's in-house contract machining business with certifications including ISO9001 2015, AS9100 Rev D, Accreditation with NADCAP for non-conventional processes plus independent accreditation with many of the industry's blue-chip OEMs.

Martin Doyle concludes: "The WAM facility gives ETG customers a tangible reference point where they can investigate the available solutions and technology from Winbro. The facility also highlights how Winbro technology can create a step-change in product development concepts and the respective production capabilities."

ETG is structured and has four divisions; UK headquarters, ETG Ireland, Hyfore Workholding and HK Technologies. Each has a clear objective, but all ensure the end-user receives the highest level of service.

It conducts business activities throughout the United Kingdom and Ireland. ETG's Headquarters in Wellesbourne, Warwickshire deliver UK operations while the whole of Ireland is served from Newbridge, Co. Kildare.

ETG's operations division is based in a new 17,500 sq ft facility located in Wellesbourne. ETG has extensive and proven expertise in turnkey CNC engineering and automation, offering industry experience and capability from one source. These include the engineering and management skills such as programming, logistics, systems integration and project management necessary to analyse, design and install a solution, to create the most appropriate response.

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A new website for Precision Technologies Group

Precision Technologies Group, the name behind PTG Holroyd's rotor milling and rotor grinding machines, PTG Powerstir friction stir welding (FSW) machines and subcontract rotor manufacturer, PTG Holroyd Precision Rotors, has announced the launch of its new website: **www.holroyd.com**

The new site features PTG's full range of friction stir welding machines for transport applications, its rotor, gear and thread milling and grinding technologies as well as its subcontract manufacturing capabilities and machine tool maintenance services.

PTG Holroyd managing director, Peter Bulkley comments: "We've taken our time to create a new, hugely user-friendly website that not only showcases our world-class machine tools, subcontract manufacturing capabilities and services, but also makes it easier than ever for customers old and new to discover the PTG technologies and services they require.

"With vastly superior search, navigation and download features, we believe our new website will better position Precision Technologies Group to take advantage of market opportunities as the green shoots of recovery begin to appear across manufacturing industry. That said, we would be delighted to receive feedback about the website from our friends and customers around the globe."

PTG's new website is currently available in English. German language and Chinese Mandarin versions will be made available in the next few weeks.

Incorporating the brands of PTG Holroyd, PTG Powerstir Friction Stir Welding and Holroyd Precision Rotors, PTG has established itself at the forefront of high-precision machine tool design, build and supply for specialised applications. The range includes advanced machine tools for the production of complex helical components such as compressor rotors, pump screws and high-accuracy gears and Powerstir machine tools for friction stir welding advanced alloys used in transport applications. With production facilities in the UK, USA and China, Holroyd Precision Rotors manufactures the special purpose, ultra-precision helical components used in a wide range of industries, including refrigeration, air-conditioning, gas and vacuum pumping, industrial air handling, aerospace, medical equipment, motion control, power transmission, power generation, oil & gas, fluid transfer and high-end automotive. PTG also provides advanced technical consulting services.

Precision Technologies Group (PTG) Ltd
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www.holroyd.com

New additive manufacturing machine range available from Kingsbury

Kingsbury has been appointed by SLM Solutions Group AG, a German manufacturer of powder bed metal additive manufacturing (AM) machines, to sell its products and services in the British and Irish markets. There are more than 600 systems in use globally.

Headquartered in Lübeck and employing in excess of 400 staff, SLM Solutions is one of the inventors of selective laser melting for 3D printing components layer by layer from metal powder. The process is used in research as well as for prototyping and increasingly for series production, predominantly in the aerospace, defence, automotive, energy, medical and tool making industries.

All SLM® machine models produce parts accurately and efficiently from aluminium, titanium, nickel, cobalt, iron and copper alloys. Positioning the machines among the most advanced on the market are exclusive features such as bi-directional re-coating, multi-laser overlap strategy and laminar gas flow.

Of the new agency agreement, Kingsbury's managing director Richard Kingsbury comments: "We are delighted to be able to offer such a comprehensive range of production-oriented powder bed AM solutions.

"We see the technology, with the freedom of design that it brings to production, becoming increasingly important as we emerge from the COVID-19 pandemic, as it will enable manufacturing industry to innovate and become more competitive."

Regional sales manager David Wilckens of SLM Solutions adds: "The choice of Kingsbury to sell and service our systems was down to them already representing many well-known German machine tool manufacturers of high-value capital equipment, all of which see themselves as a technology leader, as we do.

"The match is made even better by the agent already being committed to AM technology and having an established department, with business development and applications engineering already in place. SLM and Kingsbury have a number of UK customers in common in various industries including medical, aerospace and defence, which will be excellent reference sites for prospective users. A dedicated demonstration machine will be installed in early 2021."

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Mazak helps McLaren Racing get set for new season with rapid 5-axis installation

Yamazaki Mazak has helped the McLaren Formula 1 team step up its preparations for the 2021 season by supplying and commissioning a brand new fully simultaneous 5-axis machining centre in just four weeks.

The new machine, an INTEGREX i-100S Multi-Tasking machining centre, was ordered in December 2020 and became fully operational at McLaren's Technology Centre in Surrey at the end of the same month.

The installation is the latest step in the Formula 1 team's partnership with Mazak, which now stands at in excess of twenty years and takes the total number of Mazak machines currently used by McLaren to 28.

The i-100S benefits from a compact, ergonomic design complete with a large machining envelope. It is capable of machining both round and square workpieces up to Ø500 mm and 854 mm in length from raw material with just one setup, one machine and one operator.

Its versatility will enable it to be used for the manufacture of a variety of parts including those used within the suspension, transmission and engine systems, as well as general car system components.

Malcolm Jones, manager of machining & fabrication at McLaren Racing, comments: "As part of our longer-term investment strategy in manufacturing technologies, we plan for regular upgrades to our existing portfolio of machines to ensure we operate with the fastest, most efficient technology available.

"At the end of 2020, we acknowledged the need to increase the versatility of our in-house machining to help improve our competitiveness on the track. However, with just a small window of opportunity ahead of our 2021 team launch, we needed to act fast.

"Having broached the challenge with Mazak, we quickly identified the i-100S as an appropriate solution. Crucially, the team at Mazak was able to source a machine and arrange for it to be shipped, installed and commissioned in just four weeks. Not only does it complement our machine portfolio nicely, but it also underpins our need for more flexible and capable machines. What's more, features such as the SmoothX CNC and the second spindle will enable us produce components to a higher degree of accuracy and faster than the older generation machines.

"The i-100S is the next step forward in our larger plans to refresh our machine shop and invest in the latest simultaneous 5-axis machine tool technology. We highly value our close working relationship with Mazak which will help us to make parts faster and more accurately.

Alan Mucklow, managing director for UK & Ireland sales & service division at Yamazaki Mazak, says: "McLaren Racing has long held a special significance at Yamazaki Mazak. When the team approached us with a time-sensitive situation, we were determined to meet the challenge head-on. The desire to help deliver incremental change in a competitive sport reliant on fine margins remains as strong as ever and I hope the speed of which we were able to deliver our latest machine will stand the team in good stead. The INTEGREX i-100S is every inch the modern, versatile and flexible machining centre, delivering fully-simultaneous 5-axis technology from a compact footprint. I have no doubt that it will help the McLaren team to continue its quest for excellence."

For more information on the INTEGREX i-100S, visit: **https://www.mazakeu.co.uk/machines/integrex-i-100s**.

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Maximising efficiency and increasing capacity

Even in challenging times it is important to keep investing. Updating its most valued equipment has always been a priority for Midas Pattern Company, to maximise efficiency as well as increasing capacity. The most recent purchase has without doubt been its largest investment yet.

Weighing in at an impressive 15,150 kg and with a 7.2 m long footprint, the Haas VF-11 vertical machining centre has delivered a new versatility to the workshop. Sales and marketing manager, Rachel Sparkhall explains: "The VF-11 vastly increases our capacity and improves our turnaround. We can now machine much larger jobs in one hit, so we're not spending time setting up multiple parts. It's certainly more efficient.

"This level of investment gives both our existing and new customers the confidence to place orders with us. When they see that we own the right equipment for the job, they feel protected and assured by what we can offer. We have a long-term vision for ourselves and our clients."

The VF-11 has ample room for large parts with an envelope of 3,048 x 1,016 x 762 mm. The machine is equipped with a 24+1 side-mount tool changer.

Rachel Sparkhall adds: "The side-mount tool changer is great as it keeps your tools outside the machine. This may not seem like a big deal, but the toolholder and spindle tapers stay clean leading to less wear and tear."

The workshop required a complete reorganisation to create space although Midas is no stranger to large frame Haas machines with three VF-9s and three VF-4SS super speed machines already installed at its two Bedford factories.

The company was founded over 30 years ago in St. Neots by Alan Rance to manufacture precision pattern equipment for the local foundry industry, before moving down the A1 to Bedfordshire. Its site, which now commands over 30,000 sq ft, diversified into a precision polyurethane moulding company and now serves a wide range of industries, the largest of which are medical, medtech devices and scientific instrumentation.

Rachel Sparkhall continues: "Many of our customers have seen increased requirements during the global pandemic, particularly in investigation and testing in the medical and medtech sector. As other industries have naturally seen a quieter period, we have been able to react quickly to the change in volume of work for those who really need it and that has been very satisfying."

Midas has been a Haas customer for almost 25 years and its first Haas investment was a VF-4 back in 1997. Rachel Sparkhall says: "We knew Haas were perceived as a good brand. They have a name for reliability and accuracy. If we're happy with a brand why wouldn't we stick with it? The first machine and the support we got from Haas gave us the confidence to come back time and time again."

The technical team work closely with clients, creating polyurethane RIM tooling for bespoke designs which are ordered in low volume and are then repeated over decades. One such project was to produce a set of 5 mouldings for an electronically controlled dive unit, capable of supporting long-endurance and depth capability for some of the best dive units in the world. It was essential that parts produced could withstand extreme temperatures and all weathers, including salt water and a high level of accuracy was paramount for safety and functionality.

As a plastics manufacturer, Midas takes its responsibility to the environment very seriously. In 2019 it began the #MidasGreenInitiative. Financed entirely independently, the company achieved process carbon neutral throughout its factories by June 2020 and have since moved on to achieve Carbon net-zero. A farm of 650 solar panels power the plant, all lights are LED, packaging is shredded and recycled, single use plastics are banned and no waste goes to landfill.

Rachel Sparkhall concludes: "There's been a lot of hard work and investment in the last year and a half, but it's certainly been worth it. We also installed an energy efficient compressor, an essential piece of equipment for our bank of Haas CNC machines and have benefitted from significantly reduced energy usage."

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Comprehensively upgraded machining centres raise performance and lower costs

Heller's fourth-generation of 4-axis, twin-pallet-change, Horizontal-Spindle Machining Centres (HMCs) in its H-series have been extensively upgraded in terms of both hardware and software to increase their productivity. They are available in the UK and Ireland through the German firm's subsidiary in Redditch, where many of the machines are assembled.

Half of the smaller models in the eight-machine range have undergone a holistic makeover that has seen the introduction of faster tool changes, six additional new spindle of inline design, more structural stability to maximise metal cutting capability throughout the entire working volume, even at the extremes of axis travels and a Heller graphical user interface for the Fanuc control option.

The new H2000, H4000, H5000 and H6000 Gen4 models offer the same machining envelopes as before, from 630 to 1,000 mm cube. Apart from the smallest model that allows a maximum workpiece weight of 800 kg, the others support 1.4 tonnes on the table. The full H-series range extends through four more machines to the H16000 with axis travels of 2.4 x 1.6 x 1.6 m.

With reduction in production cost per part firmly in mind, an optional SPEED

equipment package offers elevated rapids of up to 90 m/min, as well as optimised tool change at three speeds that are tool weight dependent and faster rotary clamping to deliver a reduction in chip-to-chip time of up to 21 percent. The package also optimises Z-axis and B-axis dynamics according to the fixture mass and the weight of the component on the table. Additionally, there is a POWER package with standard rapids up to 65 m/min and tool change times reduced by up to 15 percent offering linear rather than rotary encoder feedback of axis position in X, Y and Z.

New also is the availability of two Dynamic Cutting (DC) universal direct-drive motor spindles, HSK-A63/16,000 rpm / 180 Nm and HSK-A100/12,000 rpm/400 Nm, and a Power Cutting (PC) spindle, HSK-A100/10,000 rpm/360 Nm, bringing the total number of spindle options to nine, six of them of inline design and all feature Heller technology for rapid interchangeability, leading to maximum machine availability coupled with low service costs. An out-facing slide system for internal boring and external turning is available, with control of the requisite U-axis already integrated into the machine control.

It is noteworthy that all of the manufacturer's compact, high torque spindles feature ease of servicing, integrated leakage checking to prevent damage and rapid run-up times for high productivity. They are all produced in-house in a recently-opened, air-conditioned, automated facility at Heller's headquarters in Nürtingen.

The rotary table, with a milling torque of up to 2,900 Nm in the two larger machines, H5000 and H6000, has been FEM-optimised and reinforced with a YRT-C bearing for higher rigidity as well as more rapid positioning and clamping. Its improved robustness and symmetry of construction allows components to be machined at the extremes of the X and Y axis strokes, a goal

further promoted in the two smaller Gen4 models by increasing the width of the linear guideways from 35 mm to 45 mm. Being able to use the whole working volume to maximum effect can have a profound influence on finances, as it is possible to choose a smaller size of machine for a given set of intended applications and thereby reduce capital investment and running costs.

The control consoles where the operator interfaces with the machine, including at the component and tool setting areas, have been made even more user-friendly. The operating console of the Siemens Sinumeric 840D sl control has a 24-inch touch screen, while the FANUC 31i-B option has gained a Heller graphical user interface and a newly-designed HMI panel.

Heller4Industry functions are very much in evidence for enhancing production efficiency and for machine monitoring. The optional software suite is universally applicable from a single machine with or without a network connection, through multi-machine sites, to multi-site operations with cloud-base communication. The standard umati interface, universal machine technology interface, enables machine and

production data acquisition. Monitoring of potential collisions, energy consumption, axis wear, spindle condition and tool overload and breakage are all application options.

Commonality of constituent parts keeps machine build costs down. For example, identical ballscrew drives are employed in the two smaller Gen4 models, while the drive in the Z-axis has been optimised for improved milling behaviour. The two larger Gen4 models incorporate a seven-point media interface with 80 bar or 200 bar hydraulic pressure.

Electrolytically galvanised internal guard surfaces and liberal use of stainless steel in the machine construction, notably in the working area and the tool and workpiece setting stations, enhance durability while steep side walls promote efficient evacuation of swarf. LED lighting has been improved in all operator areas and a camera can be integrated above the tool change door. Easy access to the working area, a short distance from the front of the machine to the spindle and a low component loading height ensure ergonomic machine operation.

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Automation takes centre stage with new 10-pallet Kitamura

Now in its 17th year of business, Hi-Spec Precision Engineering Ltd has evolved from a small start-up business to an established subcontract manufacturer that has fully embraced the latest CNC technology and more recently automation technology to drive growth and productivity.

The Market Overton company has evolved over the last decade to encompass everything from conventional and CNC machining to grinding, lapping, honing, welding and fabrication, hydraulic pressure testing and assembly with 14 CNCs now on the shop floor. As part of the journey, Hi-Spec has invested in automation. The first move was investing in barfeed equipment for its turning centres, more recently robotic loading/unloading for machining centres and now, a 10-pallet Kitamura Mycenter HX250iG horizontal machining centre from Dugard. In the last four years since starting the automation journey, Hi-Spec has lost staff due to retirement and now, the 8-employee business is more productive than ever. Despite having employees in non-production roles such as admin, inspection and fabrication, the turnover to staff ratio per employee was once 8 percent, this is now 16 percent and the arrival of the multi-pallet machine will only increase this profitability further.

The workload at Hi-Spec encompasses everything from agriculture and aggregate, construction, motorsport, fluid power and electric guitars. The components at Hi-Spec include hydraulic valves and cylinders through to equipment for the quarry and aggregate industry, producing anything from prototypes and small batches up to production runs of 10,000+. The company is also renowned in the music industry manufacturing custom precision-crafted electric guitars. The company claims to be the only UK manufacturer and sales outlet for precision guitar components such as guitar and bass bridges and spares, control plates, pick-up screws, neck ferrules and screws, pick-up surrounds and more. The components that are sold worldwide can now be manufactured on the Kitamura Mycenter.

Commenting on the reasoning behind investing in such a high-quality machine tool, Hi-Spec Precision Engineering Ltd managing director, Darren Grainger says: "The milling work has increased a lot over the last year and the cycle times are getting longer with more complex components. This means that some jobs can tie a machine up for 1 to 2 weeks at a time, so we needed to look at some way of getting higher production rates and more unmanned hours. Horizontal machining centres are known as production machines and it seemed like an obvious choice. The 10-pallet pool is the icing on the cake."

A typical example of why the company needed to invest in the multi-pallet machine has already been identified by Darren Grainger: "We have one order for 300 parts that is about to arrive and each part requires two operations of more than 30 minutes each. This order will tie up one machine for four weeks doing the first operation and another four weeks completing the job with the second operation. On the Kitamura machine, we will be able to reduce this cycle time from eight weeks to less than two weeks. This order is only one in a family of five or six variants that we regularly receive in similar volumes. Some of the parts take up to one hour per operation. This type of work can tie-up a single machine for up to three months and this is why we needed the multi-pallet Kitamura."

As a company with a diverse plant list that consists of a variety of different machine tool brands, the Rutland company opted for the Kitamura from Dugard. Darren Grainger explains: "The first thing that attracted me with the Kitamura was the compact footprint. Like many machine shops, we have a little bit of a space issue and for a horizontal machine, this is absolutely tiny. It is perfectly adequate for the components we produce and it slots right into our facility."

Alluding to the components that will be put on the machine, Darren Grainger says: "The parts going on this machine will range from 10-off up into production runs in the hundreds. We have kitted the machine out with Microloc tombstones and vices, so we will be able to put multiple jobs on the machine in various sizes and batch numbers and then schedule it through the shop floor. This is adding highly-productive unmanned automated manufacturing to our company."

Looking closer at the Kitamura brand, he adds: "While we haven't had a Kitamura machine before, everyone knows they have an excellent reputation. The build quality is outstanding and the base is all hand scraped for precision. The spindle speeds and the power levels are all perfect for us. We have gone for a 30-taper spindle with 15,000 rpm, an ATC of 102 tools, the 10-pallet automation, mist extraction, Renishaw spindle and tool probes and much more. The probing will be very important for checking tool breakage when we are producing M2 and M3 tapped holes and running small tools, especially when we run lights-out."

This capability may be somewhat of an understatement from the new owner of the 4-axis Kitamura Mycenter HX250iG. This is because the Kitamura machine offers industry-leading rapid feed rates of 60m/min and a pallet change time of fewer than 8 seconds and tool changes in less than a second. The precision level is epitomised by the 4th axis 0.001-degree table indexing that has a positional accuracy of +/-2 arc/sec. This is complemented by a positional accuracy on all linear axes of +/-0.002 mm with repeatability of +/-0.001 mm.

The compact machine provides X, Y and Z-axis travel of 305 by 305 by 350 mm with full 360-degree B-axis rotation and a powerful 11 kW spindle motor that offers the perfect blend for both heavy material removal rates and high-speed cutting of small to medium-sized components. Quality is instilled throughout the machine with high-resolution built-in encoders, double roller linear guideways, dual contact spindle and the ground-breaking Arumatik-Mi CNC control system that incorporates 67 million pulse encoder technology and 8,192 block look-ahead capability.

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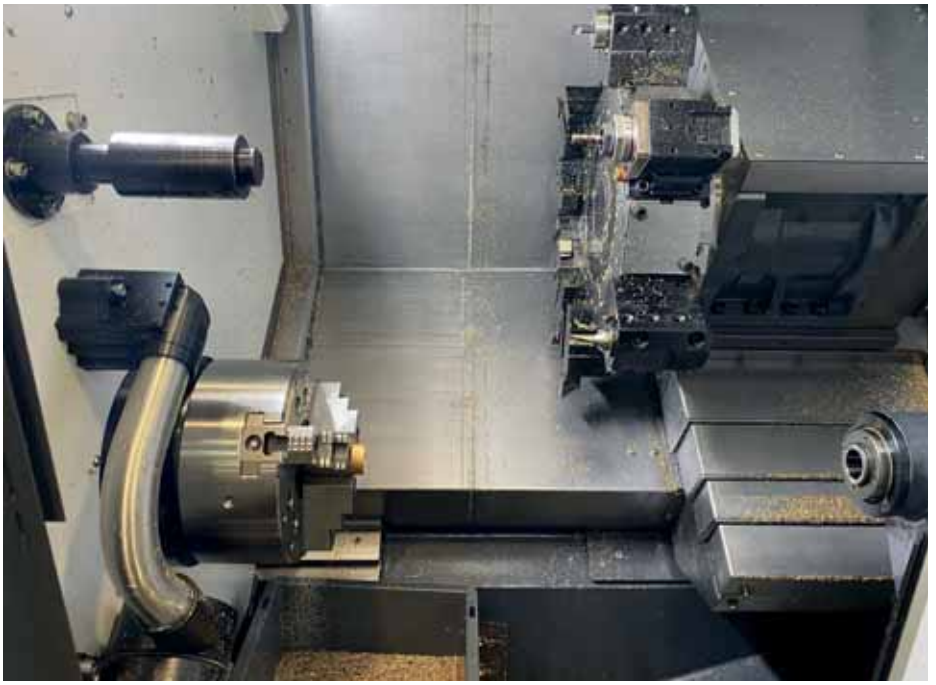
Hull subcontractor picks Victor

Established in 2008 during the worst recession of modern times, Rubitec Engineering Ltd has invested in a variety of machine tools to undertake everything from CNC milling and turning to 3D modelling, gear cutting, anodising and more. To meet the ever-diversifying demands of the industry, the subcontract manufacturer has recently purchased a Victor Vturn NP20 CNC turning centre from GM CNC Machine Tools.

With a facility near the centre of Hull, Rubitec has 28 machine tools, but the new Vturn NP20 CNC is the first Victor brand machine the company has acquired. Andy Shores, managing director of Rubitec Engineering says: "We are very pleased with the acquisition from GM CNC. The machine has cut our runtimes down and it's a nice feeling to have a level of support that ensures with just one phone call, we can have everything we need."

The new Victor Vturn NP20 machine may be the first machine of this brand on the shop floor at Rubitec Engineering, but it's not the first machine purchased from GM CNC. Alluding to whether this influenced the purchasing decision, Andy Shores has no doubt: "We have a history of buying used machines from GM CNC and this influenced our decision to buy the Victor machine. As soon as I found out that GM CNC was supplying Victor machines, there was no question when it was time to get a new CNC lathe, GM CNC was where I would go. They offer brilliant support and they are a great company to deal with. The maintenance costs with most machine tool brands are excessively high and there are very few that provide a good level of service, with GM CNC we have a company that provides service and support at a justifiable cost and this makes them a company we truly trust."



Andy Shores says: "We started the business with a 600 sq ft unit, a CNC mill and a lathe and within five to six years we had four units on the industrial estate. In 2015, we looked to bring it all under one roof and we acquired our current facility. We now have a complete machine shop that enables us to service the needs of customers in the oil & gas, military and white goods sectors. As a subcontract manufacturer, we do a lot of work for the offshore sector and this means we machine a lot of exotic and difficult materials, we don't like to say no to customers.

"We had an ageing turning centre of similar capacity and capability to the Victor, but it was unreliable and even though we service a lot of our own machines, the maintenance costs were escalating. We needed a new machine with a compact footprint and Victor fitted the bill."

Looking closer at the specifications of the Victor Vturn NP20, it has a 52 mm through spindle bar capacity. However, with the innovative design and the slant bed construction, the Victor NP20 offers a 650 mm swing over the bed and this provides 320 mm maximum turning diameter. When combined with the 520 mm distance between centres, the compact NP20 packs a punch, especially with a main spindle that generates 7.5/11/15 kW of spindle power. This compact machine with a spacious envelope is perfect for manufacturers that are challenged by floor area issues.

Andy Shores says: "It's difficult to believe, but the Victor Vturn NP20 is 1.5 m shorter in length than the old machine with the same work envelope. The previous machine had a lot of wasted space on the Z-axis and a bulky spindle head. The NP20 has the same Z-axis and more power from a smaller footprint. While we didn't purchase the machine with a barfeed, we have just won several contracts that require batch quantities high enough to justify a barfeed. The floorspace being saved by the NP20 means that we can easily add a barfeed to this machine for running longer batches."

Despite the compact area, the Victor NP20 has a total weight of four tonnes with a single piece meehanite casting that demonstrates its potential for improving precision levels and surface finishes for end users. Furthermore, this platform provides the opportunity for heavy material removal rates that can further enhance productivity levels whilst retaining this impeccable level of precision and quality that the Victor brand is renowned for.

The benefits

Considering the attributes of the machine that influenced the selection, the compact footprint of just 1,930 mm wide proved a

perfect fit for Rubitec. Within this area is a single spindle design with C-axis capability and driven tools on a robust BMT tool turret. The sturdy tool turret has 12 mounted tooling stations that can index in less than a second to reduce non cutting times. The driven tooling has a spindle speed of 4,200 rpm as standard with up to 6,000 rpm as an option with up to 2 kW of power.

Andy Shores says: "We mill a lot of flats, hexagon's, PCD's and standard milling operations and the machine is ideal for this type of work. The stability and kinematics of the Victor Vturn NP20 have increased productivity by at least 20 percent compared to our other machines. A major benefit is the improved tool life. The rigid tool turret and powerful coolant supply have improved the tool life on our milling tools by over 30 percent. The overall machine construction has also helped to increase tool life for the turning tools by 30 percent. We have 13 lathes of numerous brands and aside from one machine that is a lot bigger than the Victor Vturn NP20, none of our other machines compete with the NP20 on rigidity and tool life improvements."

Supplied with the recognised FANUC CNC control interface with a manual guide for intuitive use, the Victor NP20 was supplied as standard with the 3-step warning light, hydraulic chuck and soft jaws, chip conveyor, tool holders, coolant flush on the Z-axis with fully enclosed splash guarding. From an optional perspective, the Victor NP20 is available with a manual tailstock with power quill, manual or automatic tool presetter, part catcher, power chuck, air conditioning for electrical cabinets, high-pressure coolant, oil skimmer, oil mist collector and much more.

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Hitting the ground running

New precision machining subcontract specialist invests in ten Doosan machines in its first three months of operation

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, is the supplier of choice for a diverse and growing number of precision component manufacturers. The company, highly regarded for the depth and breadth of its machine tool range and for its range of industry-leading after-sales services, is often the first and automatic choice for many OEMs, Tier One suppliers and precision subcontractors. Increasingly it has also become the first port of call for many new start-up engineering companies.

One such company is the Gateshead-based EAG Precision Ltd which was established in March 2019 and, within its first three months of operation, had invested in ten new Doosan machine tools.

Operating from its 14,000 sq ft facility in Ryton-on-Tyne, Tyne & Wear, EAG is a privately-owned company specialising in the small and medium batch production of complex, high-precision parts for the defence, marine, medical and renewables sectors to name but a few.

To differentiate itself in the market and from its competitors, EAG has achieved ISO 9001: 2015 approval and specialises in machining complex components, including prototypes, to tight tolerances and exacting surface finishes for customers based in the UK and the US. The company, also designs, manages and implements complex turnkey projects for its customers.

To maintain its growth and profitability, EAG relies on the dedication of its highly-skilled workforce, the experience and expertise of its directors and senior management team and, of course, on the advanced machine tool technologies it has at its disposal.

In the beginning

Not many new start-ups have the confidence or wherewithal to invest in ten new machine tools straight out of the gate, but EAG is unlike many new start-up companies.

Dave Graham, EAG's managing director says: "Although the new enterprise started trading in March 2019, a great deal of preliminary planning was initiated and completed well before then. The strategic business plan we created, which we used to help obtain funding for the new company, was both robust and ambitious."

Covering all aspects of business, the plan identified key markets and customers, it highlighted, in depth, the company's key capital equipment investment plans, that included the number and type of advanced CNC machine tools it would be looking to acquire initially and in subsequent years and it established and reinforced EAG's mission, vision and values.

Machine tool imperatives

The directors and senior management team of the new company had over 100 years' collective experience of working in the precision manufacturing sector.

Their knowledge and expertise was invaluable when approaching potential customers to secure new machining contracts and orders. It was also critical in identifying and selecting the right machine tools that would meet EAG's immediate and future capacity and capability requirements.

Although EAG canvassed the market looking for the best performing and best value machine tools available, the directors' previous positive experiences of dealing with Mills CNC and of using Doosan machines, gained prior to EAG being established, did put Mills in the box seat.

Dave Graham adds: "We knew that owing to the depth and breadth of the Doosan machine tool range we would be able to find machines perfectly suited to our needs and requirements. It was also a big positive, especially for a new start-up in terms of time and logistics, if the machines could be acquired from a single source."

Many start-ups initially invest in used/pre-owned machines to get up and running. EAG opted to invest in new machine tools from day one. Dave Graham continues: "The cost differential between used and new is not as great as one might

think. We decided on new machines from Mills CNC as they were competitively priced and were backed by full warranties and Mills' industry-leading applications and after-sales support services. We were also able to take advantage of Mills CNC's machine tool financing operation, which gave us access to flexible capital equipment funding packages."

Mills CNC's stock policy means that many machines, over 70 at any given time, are available from its Campus facility in Leamington ready for immediate delivery to customers in the UK and Ireland.

Dave Graham says: "It was important that we hit the ground running from day one as we had already secured machining contracts from a number of customers. The ability to order and get our machines delivered, commissioned and installed in double-quick time was critical."

Multi-axis machines

To improve operational efficiencies, optimise manufacturing flexibility and help with leadtime fulfilment, EAG invested in a number of advanced and proven multi-tasking Doosan machines. These included Lynx long-bed lathes with Y-axes, sub-spindles and driven tools, a large-capacity Puma lathe with full mill-drill capability, Doosan DNM machining centres supplied with 4th-axis units and a high-productivity twin-pallet vertical machining centre.

All ten Doosan machines acquired by EAG are equipped with FANUC controls. This enables programmes to be transferred quickly and seamlessly between machines, when required and as such prevents production bottlenecks from occurring if, for some reason, a machine is out of action for maintenance or repair.

EAG machines precision components for a wide range of sectors and customers. As a consequence parts are made from a range of materials that include steels, aluminium alloys, Duplex and stainless steels, plastics, inconels, titanium etc. The Doosan machines, with their rigid structure and build characteristics and advanced spindle technology are versatile and capable of machining such diverse materials to high geometric tolerances and surface finishes.

Dave Graham says: "The Doosan machines provide us with manufacturing flexibility. Our DNM machining centres enable us to machine prismatic parts, up to 1 m x 1 m x 1 m, and the largest of our Doosan lathes provides us with a maximum turning diameter of 550 mm."

New start-up companies are increasingly turning to Mills CNC to help them with their machine tool and, more recently, their automation requirements. Attracted by the depth and breadth of the Doosan machine tool range, the machines' competitive prices, the immediate availability from stock and the quality of the company's after-sales support services; it's a trend that looks set to continue.

Dave Graham concludes: "We are delighted with our Doosan machine tools and the level of service we receive from Mills CNC."

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Starrag opens up a new world of gantry milling to UK customers

Starrag UK is offering potential customers of gantry mills an unrivalled range of machines by complementing its world-renowned Starrag Group Droop+Rein brand with the machine portfolio built in Australia by H & H Machine Tools.

The collaborative agreement provides UK customers with access to an all-embracing range of 5- and 6-axis machines to meet every need and with price tags which will suit all budgets.

Importantly, too, the scope of optional extras available across both ranges also makes available the widest choice of cost-effective machining technologies for single setup, multi-tasking machining of all types of materials and across all industry sectors.

H & H Machine Tools' managing director Thomas Hegmann says: "H & H 5-axis gantry machines can utilises a choice of spindles, milling heads and work envelopes to suit individual requirements in terms of machining performance, component size and floor space."

Starrag UK's director for sales and applications, Lee Scott, adds: "Potential UK customers at every tier of manufacturing can now access a range of cost-effective gantry milling machines which are unrivalled for its technical abilities. Previously, we only focused on very complex applications, usually requiring automated head changing, but now we can discuss any gantry application.

"In addition, Starrag UK is also well-versed in the H & H machine construction techniques and build technologies, so the machines' installation, commissioning, service and maintenance are all catered for professionally."

The agreement between Starrag and H & H follows the success of the two companies working closely together to deliver and subsequently commission then maintain the largest ever machine to be put into operation in Australia: a Droop+Rein gantry mill with X, Y and Z axes traverses of 14,000 mm x 13,000 mm x 3,500 mm and an 11 m rotary table.

Now, with H & H gantry mills being available in the UK for the first time, potential customers have access to four main 5-axis machine ranges from the Australian manufacturer. All machines have linear motors in X and Y axes; ballscrew or linear motor in Z axis and all milling heads are direct drive:

ULTRA 5 has X ,Y, Z travels from 2,000 mm by 2,000 mm by 800 mm and HSK-A 100 with 63 50 kW spindles rated from 15,000 revs/min (A 100) and 24,000 revs/min (A 63); ALPHA 5 has X, Y, Z from 2,000 mm by 2,000 mm by 1,000 mm and HSK-A 63 30 kW spindle rated from 18,000 revs/min; AGILE P5 has X, Y, Z from 21,000 mm by 15,000 mm by 800 mm and HSK-A 100 and 63 spindles rated from 30 (A63) to 50 kW (A 100) providing from 18,000 revs/min (A 63) 15,000 revs/min (A 100); ULTRA 8 has X, Y, Z travels from

2,200 mm by 2,000 mm by 800 mm, with HSK- A 63 40 kW/24,000 revs/min and with HSK – 100 50 kW 15,000 revs/min spindles.

These complement Starrag's world-renowned range of 6-axis Droop+Rein portal, gantry and overhead gantry milling portfolio. It is a complete spectrum of large vertical 5-axis milling solutions from a single source, for applications from high-speed through to heavy-duty cutting.

The range includes, as standard, machines of overhead gantry design in the form of the FOGS HD and FOGS NEO/N40 models with X, Y Z axes travels from 3,800 mm by 2,500 mm by 1,500 mm and 40/50 kW spindles providing 4,000/2,500 revs/min.

Floor-guided gantry design models, the GS and GFS NEO/N40 models, complement the up to 201 hp G and GF series with X, Y, Z from 4,000 mm by 3,000 mm by 1,500 mm and 40/50 Kw spindles providing 4,000/2,500 revs/min.

The TS and TFS NEO/N40 models plus the T and TF models boast 201 hp spindle power and 12,000 Nm machining capability with X, Y, Z travels from 3,000 mm by 3,000 mm by 1,500 mm and 40/50 kW spindles providing 4,000/2,500 revs/min. These machines are of portal design.

In addition, a wide choice of milling heads, over 300 different styles and ratings are available, enables Starrag's application experts to configure machines exactly to meet current and future applications. With the H & H variations also on board, Starrag UK will continue to maintain its 'Engineering precisely what you value' strategy.

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A productive partnership in sliding head technology

NSR Engineering, a Bristol-based subcontractor specialising in turned and milled components, is celebrating twenty years of success through its partnership with sliding head lathe supplier Star Micronics GB Ltd.

Formerly known as North Somerset Reproductions Limited with its manufacturing heritage dating back to 1963, the family-run business now recognised as NSR Engineering has become an established supplier of precision components with an international customer base.

Investing in its first Star lathe in 2000, the immediate advantages of incorporating sliding head technology enabled NSR to quickly expand its machining portfolio further within just 18 months. With the additional two Star machines it acquired, the company's expanding order book soon led it to outgrow its workshop. In response, NSR purchased its own dedicated 5,000 sq ft facility in 2002 and transferred its full capacity of three Star lathes and 14 cam auto machines.

Supported by Star GB, NSR's engineering

team became increasingly confident with the new type of technology and quickly learnt how to optimise its applications for maximum productivity. As a result, the relationship between the two companies flourished and word quickly spread of NSR's ability to manufacture complex mill-turn components that many subcontractors could simply not compete with.

Driven to offer its customers the best possible service and adopt the latest advancements in technology, NSR became the very first company to take delivery of a Star SR-20RIII following its launch in 2007.

Fast forward to today, NSR has developed into a predominantly Star sliding head shop with an international customer base. Spanning a plethora of industries including oil and gas, aerospace, automotive and electronics, NSR has built its reputation on offering comprehensive solutions to complex challenges, while maintaining a high standard of customer service and component quality.

With a total of nine modern Star lathes running twenty-four hours a day, NSR's sliding head section alone offers over 1,500 hours of machining potential per week. Covering the full spectrum of capacity within the machine tool supplier's portfolio, NSR's range of Star machines are able to produce precision mill-turn components from 42 mm diameter material all the way down to 3.175 mm (1/8″ bar). The company's most recent investment was an SR-20JII Type B; the latest addition to Star's 20 mm SR range offering enhanced power on the spindles and live tools, more tooling positions and increased rigidity.

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New GROB 5-axis machine helps machining experts improve production quality, complexity and speed

T&C Concepts, a family-owned machine shop in the Seattle area, recently added a GROB G350 5-axis machine to its existing portfolio of machining, welding and 3D printing equipment.

With decades of experience as an open-wheel car racing workshop, the shop had expanded into structural prototyping of parts for major aerospace companies in 2017. It knew that this type of precision work requires the most accurate and rigid machining possible. The new GROB equipment is helping the company significantly increase volume capacity, speed, accuracy and part quality.

Racing experts know success requires top-quality machining equipment

After converting its race car workshop into a machine shop, demand began to grow for prototyping and Long-Term Agreement (LTA) part production work. Although it runs some welding and 3D printing equipment, the bulk of the company's production is in machining. The shop has grown rapidly since its race car days. After starting with a vertical mill, it added a small 5-axis machine and by late 2019 found even that couldn't keep up with demand. That's when the company began its search for larger, more powerful and more accurate 5-axis machine technology.

Trey Starks, co-owner of T&C Concepts, was guided by his open-wheel car racing experience in the search for the right equipment. "As a professional racer, I want to have the best equipment on the racetrack to have the best opportunity to win. The same mindset applies in my machine shop. I want the best opportunity for success, which requires top-quality machining equipment."

Considering GROB to be top of the class in the world of machine tools, T&C Concepts decided to purchase one of the company's top quality, versatile universal machining centres, reasoning that it would set it apart from competitors. After looking at all the options, it found that the G350 universal machine had the best design and layout for its needs.

Trey Starks continues: "The horizontal spindle orientation and the ability to spin the table all the way upside-down are great for chip evacuation and the fact that the spindle can pull all the way out of the work area means that we can use the entire work envelope to machine larger and more complex parts."

Installed in February 2020, the T&C Concepts team got right to work machining aerospace parts, from ground support equipment to rocket engine parts. The equipment also includes a pallet changer, which has increased production speed and expanded the capacity for LTA work by enabling operators to load the machine on multiple stations and automate production.

Trey Starks concludes: "We have been able to quote and start on jobs that are more complex, use tougher materials and have more complex geometry than ever before. We don't have to shy away from complex work for fear of not having the capabilities to complete it. The GROB G350 is helping us bring our relatively young machine shop to the table and to deliver high quality prototypes and parts for our customers."

The company GROB-WERKE GmbH & Co. KG was founded in 1926 in Munich, Germany. After producing various types of machine tools, it was in the 1950's that GROB started to produce special machines, i.e transfer lines, for the car industry. Since then, GROB has become one of the leading players in the machine tool industry. Today, the GROB-Group is much more than a manufacturer of machining centers. Its product range is comprised of stand-alone machines, complex flexible systems, assembly and automated equipment and entire system solutions. With production plants in Germany, Brazil and the USA as well as subsidiaries in China, South Korea, India, Mexico, Hungary, Russia and the UK, GROB is present world-wide to support its customers.

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A good time to buy

The decision to buy a new CNC lathe is always an important one. It can be a big investment and, as a result, it is essential to get the best value for money. In the current climate, it is very important to have very clear recovery plans and assistance available to buy machinery.

Buying new machines in times of crisis is not an act of madness. It is a great opportunity for those who wish to have the capacity to react to ever changing markets. CMZ can offer support and assistance to customers wanting to purchase at this difficult time. Its prices are competitive and the quality of its machines continue to be impressive. The company takes extra care over each and every step of the manufacturing process.

The economic rebound has already started and it will be led by the organisations that are best able to adapt to the new situation. Having a new powerful, accurate, reliable CNC lathe among your machinery arsenal will set you apart from the crowd and will give you added value that will allow you to plan for your customers' orders or your internal needs in the medium term.

The company has been in the market more than 70 years. Being part of an ever-changing sector like machine tools has ensured that it continues to reinvent itself and improve its production processes in order to offer the best CNC lathes.

During this time, it has continued to improve its manufacturing process to produce strong, precise and reliable machines.

CMZ customers span a varied range of different types of companies. It would like to invite everyone who is looking for a used lathe to visit the used lathes section on its website. All of the used lathes have been fully disassembled and reconstructed by CMZ. Week by week, the company shows the progress of the reconstruction process. Here, it also applies its motto, to polish and take care over every detail. Although the second-hand market is very broad, there aren't that many machines that have been reconditioned by the manufacturer themselves.

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New catalogues reflect growth in machine choice

Not one but two new catalogues are now available from XYZ Machine Tools, one covering milling/machining centres and the other featuring its turning machine range. The move to split the catalogues was driven by the growth in number of machines now available from XYZ Machine Tools, along with a recognition that while some customers have requirements for milling and turning capability, many simply want one or the other. The move to two catalogues also allows for much larger images, with each machine benefitting from one, if not two pages to highlight the specifications and key features.

"With the addition of several new machines and ranges to the XYZ Machine Tools' portfolio, splitting the catalogue into two separate documents made perfect sense," says Nigel Atherton, managing director, XYZ Machine Tools. "Customers are also being more specific and selective in their machine tool buying, so it was time to focus on the two sectors of the range as we have done."

The catalogue complements the detailed online machine specifications available at **www.xyzmachinetools.com** and the support provided by the nationwide team of area sales managers, along with a network of technical centres and showrooms available for machine demonstrations and training. All of which means customers can access the information they need about any of the machines in the XYZ Machine Tools range to make an informed purchasing decision whenever they need it.

XYZ has been developing, testing and refining its range of machine tools for over 35 years. Its winning principles of combining outstanding build quality with some of the world's best control systems, namely ProtoTRAK® and Siemens, has seen the product range become a popular choice for prototype and low volume production.

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Speed meets outstanding accuracy

New ROBOCUT α-CiC series - multipurpose wire EDM

John Barber interviews Andy Spence, ROBOCUT product manager for FANUC UK & Ireland

How has the COVID-19 pandemic affected product development for FANUC over the past twelve months?

Everything that we sell is Japanese manufactured and so development is always ongoing. The new Wire EDM machines would have been two or more years in the making and there was no timeframe as such. It was simply the next generation of a highly successful product. Every year we have section meetings and we consider feedback from our customers. If a viable new feature is proposed, then we investigate the possibility of adding it to the machine. It's fine-tuning for FANUC. Each machine improves on the previous model to provide extra quality to the customer.

Can you describe the key benefits of the new ROBOCUT α-CiC series machines?

The machines are the next generation of ROBOCUT. The team has redesigned the structure of the machine, giving it more stability and increasing the precision and quality of the cutting. There have been enhancements made to features within the software, such as i-Pulse control which improves the corner control, while the AWF feed system is renowned as being probably the best in the business. We also have the capability to fully wire submerge feed up to 500 mm. High speed machines with high-speed cutting and wire feed, they can run unmanned for continuous working. The 400 and 600 model's are the first to be available in this range with the 800 version to be introduced later in the year.

With the introduction of these new machines, does it enable FANUC to enter new markets?

We are hoping it will encourage non-FANUC users to use the product. It is a very reliable product. All FANUC products are highly reliable and are renowned for their accuracy and precision. By introducing these new machines to the market, customers productivity can be enhanced as the potential cut time savings are between 15-30 percent.

How do the machines integrate FANUC's management software tool?

FANUC has its own programming software called CAMi which is an offline system to set your component up with the number of cuts. We also utilise LINKi which can monitor the machines and provide users with a full report and offline monitoring.

When will the new machines become available?

We are quoting and taking orders now. Realistically, as the machines are a factory order at the moment, they should be arriving around May time into the UK. We have literally sold every IB machine that we have available and there is likely to be a handful of demo machines around Europe.

We are in a rush now to get these machines across, but eventually, if it is what we call a pipeline machine, we could be delivering within two to four weeks. With the new regulations, it has slowed a bit, but in the past, my quickest turnaround was an order being received on a Friday and delivered to the customer by the following Wednesday and that was from Europe.

We do not stock them in the UK apart from our demo machines. Everything is done through our European headquarters where we will have a large supply of machines available for quick delivery.

What can FANUC offer its customers in terms of service?

All through Europe we have a full-service network. We were set a target, I believe, to be onsite within the region of 24 hours, which then got reduced. Currently, we are working to an average of 19 hours to be onsite. The beauty of FANUC machines is that they are very reliable. The majority of questions that I receive from customers are queries like: 'I have just seen this feature, how do I use it?' never a mechanical issue as such.

Our service department has a dedicated line and email contact for each product area. For example, a ROBOCUT customer will

have a direct link to the ROBOCUT service area. There is always someone available on the service desk. We hold somewhere in the region of €2 million worth of parts across all the products and FANUC's philosophy is for all active manufacturing products we have a 98 percent stock holding. Our huge European network holds similar amounts of stock. There is also the online E-Store which is available 24/7.

In your experience, what has been the biggest development in Wire-EDM over the years?

It is a combination of things really: the hardware, the software and even the wire itself. The development that FANUC does in terms of the hardware and software is second to none. We have over 600 people in Research & Development (RAD) across all of the products. EDM is not a fast process and customers are always looking to increase the cutting speeds. The machines, at the moment, have the capability of using zero five wire, less than the thickness of one of the hairs on my head!

In your experience, how does a typical FANUC customer utilise your product range?

For example, there could be a customer who has had the same FANUC machine for twenty years and another that has had over twenty machines in the same time period. The customer may not have had the space to keep all of the machines so has continuously upgraded to the latest technology that we have offered. There is a customer in Ireland that has had 100 machines over a 22-year period. This is positive. It means customers are returning to us time and again and this is due to our machines reliability and the service that we provide.

Effectively, you could say as a company grows, it grows with FANUC?

Yes, as a new machine becomes available the customer requires the latest technology and they require that upgrade in order to become more productive.

Why would you advise a subcontractor to invest in a new ROBOCUT multipurpose wire EDM?

With these machines, you have got reliability, accuracy, ease-of-use and longevity. A FANUC machine is a machine for life and we produce parts for life. There are machines out there that have been

running for 30 plus years and are still performing. Some machines will be cheaper, but with that comes an inferior product. The low cost of running is also a huge benefit. They are economical to run and provide a great return on investment.

What can FANUC customers look forward to in the future?

I would say a continual improvement on something that is already great.

Key features at a glance:

ROBOCUT α-C400iC

• XYZ axis travel: 400 x 300 x 255

• Strong machine rigidity for high performance cutting

• Taper adjustment function for high-precision taper cutting

ROBOCUT α-C600iC

• XYZ axis travel: 600 x 400 x 310

• Automatic wire feeding up to 500 mm under submerge condition.

• Prevention of wire break through simple adjustment function.

Designed for ultimate performance

• High speed, high precision and high-quality cutting thanks to steady mechanical structure and excellent discharge devices and control.

• Stable cutting and easy adjustment of shapes through AI thermal displacement compensation function.

• Designed for continuous unmanned machining thanks to highly reliable Automatic Wire Feeding (AWF3).

• Simple and routine maintenance to reduce your downtime

• High-precision rotary table ROBOCUT CCR opens up new opportunities for your applications.

• Production and quality information management provided.

All ROBOCUT machines come with LINKi as standard, an easy-to-use graphical interface capable of monitoring up to 32 machines in real time. In conjunction with the high levels of speed and accuracy achieved by the α-C400iC and α-C600iC, LINKi helps to streamline automation of the entire fabrication processes.

All ROBOCUT machines can be customised with a number of accessories and software to further enhance productivity in the desired sector.

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Mitsubishi EDM is a necessity for aero manufacturer

As an end-to-end precision engineering, design and manufacturing business, Raysun Innovative Design is a company that provides services right the way from initial concept design, through prototyping and project management, on to manufacture and testing. The Rugby-based company was founded to do two main things: one side of the business is a tool room with its own design and manufacturing facility that specialises in jigs fixtures and tooling for the aerospace industry, the other division is a 'fast make' service that rapidly produces development parts in small quantities for gas turbines.

Like any company working in this challenging field, high-quality EDM machines are a necessity. Raysun Innovative Design is no different, recently purchasing its second Mitsubishi EDM machine, MV1200s, which sits together with the already installed MV2400S with a simultaneous 6th axis rotary indexing unit from the Engineering Technology Group (ETG).

Charles Ray, director at Raysun Innovative Design Ltd says: "We purchased our second Mitsubishi machine because we had a good experience with the first machine, the larger MV2400S. This first machine was a bit of a chance for a small business like ours, buying a 'top-end' machine-tool. However, after we had invested, we found that we were using the machine for all kinds of applications that at first didn't appear obvious. It rapidly became a machine that was used all of the time. The MV2400S soon became the go-to machine in the 'fast make' department of our business, as we realised there were a lot of applications that we could use the machine for; especially concerning gas turbine parts.

"With some of the prestigious contracts we had secured, it seemed like the obvious and right thing to do, to purchase a machine that was dedicated to the 'fast make' side of the business.

"The relationship started for me many years ago. I came across the machines during previous employment at a company called Winbro Group Technologies that required die-sink EDM equipment.

Following a lengthy procurement process, the company selected the Mitsubishi EDM machine from HK Technologies. I watched that machine run very reliably for several years, so when it came to considering wire EDM, Mitsubishi was right at the top of the list as names to consider.

"In addition to EDM, we have been involved in 3D printing for our workholding, clamping and fixturing. We've had various 3D printing systems as the technology has developed and recently we bought a system from ETG that utilises either Kevlar or carbon fibre. For example, we have made fixtures where we can put a turbine route blade form into the printed fixture and use the fixture for laser marking. We have printed another fixture where we have applied a small chuck detail to the underside of the fixture that also has a turbine blade root form. This fixture is used as a soft fixture for CMM inspection."

Quality guaranteed

Charles Ray continues: "The quality of the Mitsubishi machines really is the core of our business. We rely on them perhaps more heavily than we should, but if we are

measuring a part on the CMM and we get a questionable result we look at the CMM first rather than the EDM machine. This demonstrates our reliance and faith placed in this particular platform.

"Working with aerospace and producing parts that fly, there has been an increase in demand from our customers for us to work at the NADCAP level. The two Mitsubishi machines have made it much easier for us to work at that level than perhaps other equipment we have. The new D-Cube control system is very well set up, there is a maintenance schedule that can be contained, and we can add to it. The machine is also self-diagnosing, self-controlling and the diagnostics on board are at such a level, that the work we have to do as a user is limited to achieve a NADCAP level of work."

Educating the team

"As an engineering group, we've had very limited previous knowledge of EDM. The toolmakers we employ, principally have a background in milling, turning and grinding. I wouldn't say that EDM has been something of a black art, but it's something where there has been very little previous experience. So, when we are talking about complex manufacturing processes, which EDM is, we have one or two ways of dealing with things. We either send the guys on comprehensive training courses to understand the technology or, what has happened in our case is that we have relied heavily upon the built-in technology of the CNC units on the Mitsubishi MV1200S and MV2400S machines. The CNC control unit allows us to fill in a very limited number of fields, such as type of material, type of profile and number of cuts, the machine selects the technology that will work for us."

Regarding the new CNC configuration on the Mitsubishi MV1200S machine, Charles Ray says: "I am not a programmer myself, but my colleagues tell me the control is considerably upgraded from the previous version on the MV2400S that was installed some years back. From a quality viewpoint, it is much more accessible for maintenance routines and we can add our own maintenance requirements into the control. The guys tell me it's quite a similar platform, so they didn't have to 'go back to school' to learn how to reuse it, but there are a lot of new features and new facilities on board. Furthermore, the visual display gives more feedback."

Charles Ray concludes: "The first Mitsubishi machine has almost worked non-stop for nearly 5 years. The machine has 6-axis capability and this has helped because we had parts that needed to be held in several different configurations. The rotary axis means we can hold the part once, but then rotate it to several different positions. So, we are not using it as an active axis, but more as a positional axis. This has made us more flexible with the new work that is coming our way, and we can produce our parts with fewer setups and much faster cycle times at a lower cost.

"If we were in the market for another wire EDM machine, which we may be in the future, there is little doubt that Mitsubishi and ETG would have to be top of the list for consideration."

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High precision EDM machine for cable tie mould manufacture reduces electrode use by 40 percent

A Japanese-built Makino spark erosion machine has been supplied by the manufacturer's UK agent NCMT to the Manchester facility of cable management products solutions provider HellermannTyton for producing high precision plastic injection moulds.

The company's toolroom engineer Rob Pickup, who has 20 years' EDM experience, says that the super-low wear rate of the copper electrodes using the Makino has cut their usage by around two-fifths, lowering production costs and speeding mould manufacture through the need for fewer electrode changes.

The toolroom in Manchester supplies multi cavitation injection moulds produced mainly using 52 Rc Stavax to meet the demands of the local production operation. The cable ties, fir trees, clips and other cable management solutions produced in the UK factory serve most end user markets.

There are wire-cut EDM machines in the Manchester toolroom and other die-sinkers in addition to the Makino. Spark erosion is inherently a slow manufacturing process and the toolroom is keen to avoid a bottleneck developing as demand for the company's cable management products continues to rise.

The Makino EDNC6 die-sink EDM machine installed by NCMT in Hellermann Tyton's Manchester toolroom

Rob Pickup, toolroom engineer at HellermannTyton's Manchester factory

Rob Pickup says: "We wanted to increase sinking capacity, not so much for our higher speed applications but more for producing very high accuracy moulds.

"The radius on the peak of the tooth form is less than 50 microns, so we needed a die-sinker on which electrode wear rate is super-low. We found that performance in the Makino EDNC6, which has probably the best generator on the market.

"An average job here uses up to 15 electrodes on one of our other die-sinking machines, but on the Makino we can rely on that number being reduced to nine.

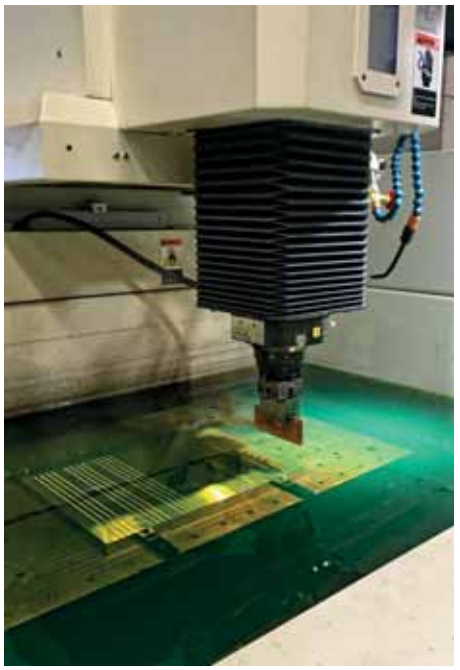
"It represents a big saving in their manufacture as well as in the copper used and the number of tool changes. Moreover the result is more repeatable, so there is never any rework."

Rob Pickup singles out the Hyper-i control system on the EDNC6 for particular praise. It is fitted to the Makino's wire-cut EDM machines as well as its die-sinkers and uses an interface similar to that found on tablets and smartphones. Programs in Manchester are mainly created off-line, but intelligent, intuitive, interactive functions built into the control assist the operator to optimise them at every step of the machining process. They provide easy access to and selection of power settings to produce accurate results in the fastest possible cycle times.

The capability and ease of operation of the Hyper-i control is enhanced by integrated on-board digital manuals, intelligent E-Tech Doctor help functions and an e-learning training system that can be quickly accessed for operator convenience. They are especially useful for assisting operators with less EDM experience, as if a

mould is not turning out perfectly, the database can be interrogated to provide the ideal parameters to generate efficient and safe burn routines for continuing the job.

The standard configuration of the EDNC6 utilises a programmable rise-and-fall work tank that sinks below table level to accommodate workpieces up to 1,000 mm x 750 mm. However, the machine installed at HellermannTyton is a wide tank version that supports larger moulds and incorporates a programmable rise-and-fall front door. Access to the work zone is excellent, offering fast workpiece setup and process monitoring due to the stationary worktable. The dielectric reservoir is incorporated into the base casting to improve thermal stability and minimise machine footprint.



A cable tie plastic injection mould being sparked on the EDNC6

Close-up of the automatic electrode changer in the EDNC6

HellermannTyton also uses graphite electrodes in the die-sink area, on which yellow RFID identification tags store information on each tool including its name, undersize and X,Y,Z offsets. The data is interrogated using a mobile phone app

Rob Pickup concludes: "The support and applications input from NCMT have been great and so has the performance of the Makino spark eroder. There have been no reliability issues since it was installed and essentially that is what we bought into at the outset."

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High precision and high speed

EDM drilling makes it possible to produce the smallest of drill holes, independent of material hardness, at high speed. The process is fast and flexible. It was once used, mainly, for creating starter holes, for subsequent wire EDM operations, but now is used more extensively in the aerospace, medical and mould tool and die sectors.

GF Machining Solutions can supply manufacturers with best-in class EDM hole drill solutions exemplified by its AgieCharmilles DRILL 20 machine. Control technology is important when performing high precision EDM hole drilling operations. The motion of the EDM's axes will be familiar to anyone who has run a milling machine: moving the electrode through the work envelope follows the same principle. However, the control on EDM machines also manages the power supply, spark creation and automatic electrode feed too.

One of the most important parts of the control is the power supply system that supplies the energy to the electrode. Sophisticated energy control is important to create very fine sparks, and the smaller the spark, the smaller the hole that can be produced. Power levels are adjusted automatically by the control helping to improve accuracy and surface finishes.

EDMs are adept at creating very small holes in difficult-to-machine materials. Using small diameter electrodes means that tool breakage, a scourge in conventional drilling operations, does not occur.

Electrodes used for precision EDM drilling operations are tubular, not solid, with a spiral-shaped interior which when combined with high-pressure flushing ensures that machined material is not left in the hole.

The AgieCharmilles DRILL 20 is a versatile, high-precision and high-speed EDM hole drill machine with an integrated rotating spindle.

The machine can be used to drill holes with depths up to 200 mm and can accommodate small electrodes with diameters ranging from 0.1-0.3 mm making it ideal for a range of applications including drilling fine start holes on lead frames or high-speed stamping moulds.

The Drill 20 features a powerful and easy-to-use HMI enabling fast and real time process monitoring and optimisation and easy job preparation and setup. Technology settings can be selected automatically for electrode material, workpiece height and electrode diameter to ensure machining optimisation.

The machine is equipped with sensors that detect short circuits, temperature fluctuations and dielectric fluid levels: all vital to ensure process reliability.

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Optimised tapping tools for more efficient hole making

Sandvik Coromant reveals improved versions of its T200 and T300 tapping tools

Sandvik Coromant is upgrading its range of tools for steel tapping operations with two updates to its solid round tools range. The next generation CoroTap® T200 spiral point tap and T300 spiral flute tap for ISO P deliver improved process security, longer tool life and a reduced cost per component.

Part of Sandvik Coromant's solid round tools offering, the CoroTap range delivers material-specific solutions for threading a variety of metals. In particular, the CoroTap T200 and T300 are optimised for ISO P1 and P2 steel workpiece materials, making them suitable for machining components in the automotive and general engineering industries. This includes crankshafts, steering knuckles and general engineering components such as housings and flanges. Both tools are suitable for mass production.

The CoroTap T200 has a spiral point, while the T300 is a spiral flute tap. While the spiral point of the T200 is suited for machining through holes, where chips are pushed forwards, the T300 is catered to blind holes, where there is no exit hole and chips must be pulled backwards. As part of the upgrade, both tools have a new surface treatment, as well as improved edge rounding for better finishing inside the machined hole. An improved flute form also offers better overall performance.

As a result of these upgrades, manufacturers will benefit from improved process security with increased resistance to edge chipping, leading to fewer tool breakages and an improved quality of the machined thread. In addition, cutting speeds are higher than previous versions of the tool and there is an overall reduction in the cost per part.

Another major difference compared to previous versions of the CoroTap range is the improved CoroTap T200 and T300 that can benefit from Sandvik Coromant's Tailor Made web assortment. Serving the industry with tailored manufacturing tools, the Tailor Made service gives customers the freedom to specify their own dimensions, without paying for a specialist tool. The taps can be adjusted to meet the demands of multiple industries and are adaptable to specific requirements.

"Performance case data demonstrates significant improvement for the tools," explains Lisa Belfrage, global product manager at Sandvik Coromant. "In fact, a comparison of the new and existing T200 tap demonstrates a 121 percent increase in tool life, with the potential to machine over double the number of threaded holes using a single tool. Productivity is also increased with the upgraded T200, with cutting speeds increasing from 18 m/min to 24 m/min with machining P2 steel.

"The new generation of the T300 has seen a significant increase in tool life compared to the previous version. What's more, when compared to a competing tool on the market, Sandvik Coromant's upgraded CoroTap T300 demonstrates a 57 percent increase in tool life and higher cutting speeds.

With demonstrated process improvements and the ability to offer tool customisation with the Tailor Made service, the new generations of the CoroTap tools will make thread cutting faster and more efficient for our customers.''

To learn more about the upgraded CoroTap T200 and T300 tools, visit the Sandvik Coromant website.

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing.

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Walter releases new TC620 Supreme thread mills

High cutting pressure, tool deflection, wear and overall performance are particular challenges when it comes to thread milling. The results of these common issues can be restrictive cutting performance parameters, additional cutting passes, short tool life and even tool breakage. Walter now overcomes all of these issues with the introduction of the new TC620 Supreme solid carbide universal thread milling cutter.

With the arrival of the new TC620 Supreme universal thread milling cutter, Walter is transferring the functional principle of its T2711 indexable insert thread milling cutter to smaller thread diameters. The hard-wearing characteristics of the WB10TJ solid carbide grade TC620 Supreme ensures tool wear is drastically reduced. This is further extenuated by an innovative geometry design that minimises cutting forces and the result is significantly higher feed per tooth. The multi-row design concept not only reduces machining time and tool wear, it also improves process reliability. As a universal thread milling tool that is suitable for materials from steel and stainless through to exotic alloys, this process reliability is particularly pertinent when the TC620 is used with more demanding materials such as Inconel 718.

Incorporating a through coolant facility that provides reliable chip evacuation and efficient cooling, the TC620 Supreme guarantees maximum process reliability and consequently, radius corrections are seldom necessary. Walter is launching the TC620 Supreme for thread depths of 2 and 2.5XD in dimensions from M4 to M20 to cater for the complete needs of the machine shop. The TC620 Supreme is also available in UNC 8 to UNC ¾ dimensions. This seamlessly links the new TC620 Supreme universal thread milling cutter to the Walter T2711 indexable insert thread milling cutter for larger thread requirements.

Walter AG was founded in 1919 and is now one of the world's leading metalworking companies. As a provider of specialised machining solutions, Walter offers a wide range of precision tools for milling, turning, drilling and threading applications. Walter works together with its customers to develop custom solutions for fully machining components for use in the aviation and aerospace industries, as well as automotive, energy and general engineering. The company demonstrates its engineering kompetenz at every stage of the machining process.

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Multi-dimensional sustainability

As a leading manufacturer of industrial packaging solutions, rose plastic operates with a multi-dimensional sustainability and an environmentally driven business strategy that is embeded in both its business culture and also the products it manufactures.

Environmental sustainability is at the core of the rose plastic business and it is a serious consideration in everything from product design and development through to the acquisition of recycled and sugar cane materials to production and distribution. As an industry benchmark, rose plastic has been ISO: 14001 certified for a decade and is proud of is 97 percent internal production recycling rate. When you buy a packaging solution from rose plastic, you are buying the most sustainable high-quality industrial packaging available.

rose plastic UK serves corporate customers throughout United Kingdom and Ireland. The company is located in Rotherham, South Yorkshire, bordering the Steel City of Sheffield the birthplace of Stainless Steel. Its packaging experts will work with you to ensure they provide the optimal packing solution to suit your products.

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Perfect for high-speed reaming

CERATIZIT Fullmax universal solid carbide reamer is now available in a short version

The Fullmax solid carbide reamers from CERATIZIT have long impressed with their outstanding cutting performance on a range of materials, even on hardened steels up to HRC 62. The new short version of Fullmax is even more stable to use, allowing for higher cutting speeds, with the added advantage of long service life and is even more attractive in terms of price.

The reduced length of the short version of the Fullmax solid carbide reamer offers numerous advantages. Firstly, the tool is very stable and is characterised by low vibration, resulting in up to 10 percent higher cutting speeds in the main application areas of steel and cast iron; ideal for high-speed machining. Feedrates can also be increased by 10 to 20 percent, this combination delivers machining times up to 20 percent faster. In addition, there are better reaming results in terms of surface finish and dimensional accuracy. The tool itself also benefits from reduced friction performance, which is noticeable in the longer service life.

Like the universal standard Fullmax reamers, the short versions are characterised by their specialised high-performance coating and sophisticated cutting-edge pitch, which help to reduce chatter marks and improve chip formation.

The unequal division, with cutting edges facing each other in pairs, leads to significantly reduced deviations in circularity and cylinder shapes. The increased angle

differences reduce the tendency for the tool to oscillate and form chatter marks. Thanks to the flute shape opening angle adapted to the new pitch, there is sufficient space for optimised chip removal even on long-chipping materials. This is also helped by the targeted coolant supply, which also provides high-performance cutting-edge cooling. The Fullmax solid carbide reamer short version can be used on all CNC milling and turning centres. However, its short dimensions make it particularly attractive for use on sliding head lathes.

The short series Fullmax reamer is available from stock both in H7 tolerance and in 1/100 mm increments. Dimensions can be individually configured in the diameter range of 2.96 to 20.05 mm. In addition, preferred ranges for diameters 4 mm to 12 mm and 16 mm are available from stock. A special feature of the Fullmax short series is that reamers with diameters from 15.97 mm upwards are equipped with eight cutting edges instead of the six flutes on smaller diameters. This further improves the roundness of the fit and its surface finish.

Investing in the short version of the solid carbide tool is well worth considering from a financial point of view as well. This is because the substrate savings compared to the standard Fullmax make it more cost-effective to procure. Which means that if the machining volume is low, the user will save money from the point of purchase.

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

With more than 8,000 employees at more than 30 production facilities and a sales network with over 50 branches, CERATIZIT is a global player in the carbide industry. The company's international network includes subsidiary Stadler Metalle and joint venture CB-CERATIZIT.

The company is continually investing in research and development and holds more than 1,000 patents. Innovative hard material solutions from CERATIZIT are used in various sectors, including mechanical engineering and toolmaking, in the automotive and aerospace industries and in the oil, gas and medical industries.

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Floyd turns up the pressure for sliding head lathes

Floyd Automatic Tooling has now added the new Precitronics TOHP Series of driven tooling with integrated high-pressure coolant feed to its portfolio. The exciting new TOHP system offers high-pressure through coolant delivery up to 135 bar for driven tools and applications on sliding head turning centres. The new system can drastically reduce cycle times, eliminate swarf issues, improve productivity and enhance surface finishes.

The new Precitronics TOHP extensive range of driven tooling is available for all makes of sliding head and fixed head machines fitted with a high-pressure coolant pump. Connecting the variety of live tooling configurations to the machine tool, the external high-pressure coolant pump is facilitated by a selection of high-quality ultra-compact quick-change connectors from the HEB range of locking and connecting plugs, flexible and rigid fluid distribution tubes, distribution blocks, connectors and adaptors to provide high-pressure coolant delivery to all your driven tooling stations.

In the work envelope, the Precitronics system is available for all spindle types with configurations such as ER, ER-A internal collets, CAPTO, KM, HSK, DIN, Weldon, MMT and ABS KOMET all covered. The flexibility of the Precitronics TOHP also extends to the drive connection that can connect to all types of tool connection.

The Precitronics TOHP is offered with an astounding range of options to suit all machining applications. This includes an axial system, an axial offset, axial speeders, radial double output, radial 90-degree system, radial 90-degree speeder, fixed angle, radial adjustable, axial multiple spindles, radial multiple outputs, polygon maker, thread whirling, gear hobbing and radial Y-axis, all of which can be configured to your turning centre.

Capable of reducing cycle times by up to 30 percent by delivering high-pressure coolant directly to the cutting edge with through tool delivery, many of the systems also incorporate an additional coolant nozzle that simultaneously delivers cutting fluid to the shank of the tool as well as the cutting edge, significantly improving cooling and swarf evacuation. Furthermore, the various systems can provide cutting tool speeds from 8,000 to 16,000 rpm for high-speed cutting, which is perfect for small cutting tools typically applied in the sliding head lathe environment.

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Expanded range of Wohlhaupter boring tools with 3E Tech digital display

Allied Machine & Engineering has announced the expansion of Wohlhaupter digital tools offered with external 3E Tech digital display for micro precision adjustment range measurement. The company is successfully converting a series of precision boring tools with built-in digital displays to include 3E Tech.

3E Tech combines precision adjustment measurement in the tool with an external, dockable and detachable digital display that shows the adjustment setting. This simple, micro precision readout capability facilitates reliable machining processes for high-precision components. A sensor unit fitted to the display makes direct contact with the tool to record the adjustment travel. Wired, Bluetooth or magnetic connections are not required.

The 3ETECH display unit docks onto the tool and is activated via a pushbutton. It then shows the relative adjustment value of the tool in 2 µm increments of the diameter to enable high-precision boring. As the display attaches externally and is not built-in, it can be used with all Allied Machine / Wohlhaupter tools that are equipped with 3E Tech sensor units. The external display is particularly suitable for tools having a small body diameter and for special tools with one or more adjustment units.

Built-in displays can get damaged during the machining process and solutions that are fastened to the tool by magnets can lose the setting value if contact is broken. Not so with 3E Tech as the measured values are stored in the tool itself to prevent data loss. The patent-pending interface between the digital display and the tool ensures safe detachment in the event of an unintentional spindle start and protects the operator if the display is inadvertently left on the tool.

"From now on, all our tools from the smallest to the largest diameter will be equipped with 3E Tech and it will be optionally available on special tools. The great success of the digital display has virtually forced this decision on us," says managing partner Frank-M. Wohlhaupter.

Axel Wagner, business development manager at Wohlhaupter GmbH says: "The external solution may be a little more expensive for a single tool, but it soon pays for itself when used with multiple tools. Likewise, for special solutions with multiple cutting edges that are read via the same display."

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Bromford reaches for the sky with MSC

As part of the Bromford Group, Bromford Industries Ltd in Leicester is a Tier 1 manufacturer that specialises in the Industrial Gas Turbines (IGT), power generation and aerospace sectors. As a Tier 1 supplier to the world's most demanding industry sectors and OEMs, the Bromford Group has to balance the delicacies of continuous improvement, innovation and, of course, the scrutiny of year-on-year 'cost-down' pressure. That is why the prestigious company has a long-term contract in place with MSC Industrial Supply Co., a leading, national distributor of metalworking and maintenance, repair and operations supplies known for providing high levels of service and engineering expertise.

As part of the long-term consumable supply contract with MSC, the expert in cutting tools focused on a goal to achieve a minimum turnover percentage of year-on-year 'cost down' improvements. MSC has an extensive product range that is often a necessity for making significant factory-wide 'cost down' gains at OEM and Tier 1 businesses as they consolidate their extensive and poor service supply chain. With its access to thousands of brands and hundreds of thousands of product lines that are all supported by technical experts, MSC has continually driven impressive 'cost down' results and productivity improvements for each of the four Bromford Group sites in the UK.

With integrated vending stations, continuity of cutting tool supply is guaranteed, but MSC never rests, its service to its customers goes beyond just supplying a product. The company is always striving to innovate and improve performance at Bromford. Sometimes, this commitment is pushed beyond the bounds of convention with the Bromford Group competing on the global stage for new projects, as global aerospace primes push capacity and innovation from one continent to another.

One recent aerospace engine component arrived in Bromford's Leicester facility from another Bromford Group facility in Connecticut in the US. Bromford Industries Leicester and its staff had to demonstrate the competence to manufacture the part at speed while adhering to the stringent quality requirements, all with very little cutting data. The Leicester site specialises in the production of aero engine, landing gear and marine IGT components for bluechip clients such as Rolls-Royce, Pattonair, ITP, GE, Siemens and Messier Bugatti Dowty to name a few.

To manufacture the initial batch of four Inconel 718 aerospace engine components for one of these prestigious customers, MSC applied its technical expertise, drawing from the industries largest team of application engineers, to ensure the complex components could be manufactured to specifications, and on time. With cutting tool datasheets from the US being obsolete due to the tools being unavailable, the MSC experts started from scratch and identified a rationalised tooling portfolio from a variety of suppliers, mitigating any special tooling to undertake the three operations and meet the specified deadlines. Machining the four components on a Doosan Puma 12L turning centre, the MSC solution succeeded in meeting the Bromford deadline for the initial tests.

With the initial batch complete and the competency to machine the parts proven, MSC application engineer Rob Smith knew better results could be achieved. With the second batch of eight parts pending, the MSC technical experts revisited the engine components, the cutting tools and respective machining strategies. The recommendation was a switch to ceramic cutting tools for the rough turning and grooving operations.

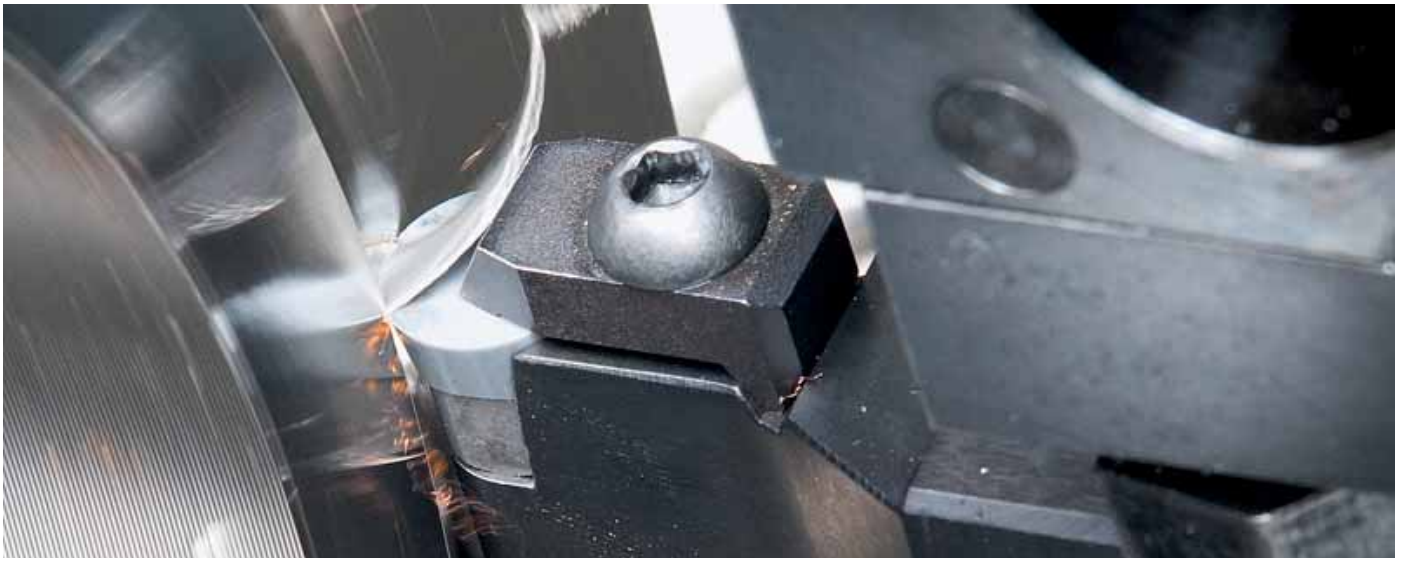
Rob Smith says: "At the start of 2020, MSC formed a relationship with leading Japanese ceramic tooling brand NTK and we knew the different physical properties of ceramic tooling would yield impressive results on heat resistant aerospace grade alloys. By nature, ceramic tooling is more brittle and susceptible to breakages if not managed with the correct machining strategy but, on the other hand, it can machine at speeds and feeds 10 to 15 times higher than carbide tooling.

"We collaborated with Simon Huxtable from NTK and the proposed strategy was to first remove the CNMG and SNMG carbide inserts and replace them with a round RNGN insert from NTK's SX9 portfolio. The SiAlON grade that combines silicon nitride ceramic and alumina ceramic is claimed to be perfect for machining heat-resistant alloys at parameters way beyond carbide, so we put it to the test.

"We chose to partner with MSC six years ago and ever since they've been an extension to our business. Because continuous improvement is important to us, we are always looking to make our processes better. With MSC, we know their engineers have the knowledge and expertise to help us achieve our goals."

After increasing the surface speed from 43 m/min to 250 m/min with a feed rate increase from 18 mm/min to 106 mm/min, the results soon followed. Rough turning the face and diameter of the 150 mm diameter workpiece, the NTK SX9 RNGN insert not only replaced two previous carbide tools and eliminated the respective tool changeover, but it also slashed cycle times from 180 minutes to 27 minutes for the roughing operation. While the previous carbide tooling method delivered a significant improvement on the original parameters from the overseas plant, the application of NTK's SX9 ceramic inserts made a huge step forward from the method initially instigated by MSC.

Rob Smith continues: "We conduct extensive benchmarking analysis and have



calculated that Bromford would require 312 SX9 inserts to complete a run of 312 parts compared to a requirement of 470 CNMG carbide inserts and an additional 78 SNMG inserts. The NTK insert is achieving a tool life at least 2.5 times better than the previous carbide grade whilst accelerating cycle times to levels never before seen at Bromford."

MSC also revisited the previous grooving operation that had been instigated with a world-leading carbide tooling brand, and once again implemented improvements with NTK's SX9 grade.

Rob Smith concludes: "We looked at the grooving operation as it was contributing to 22 minutes of the overall cycle time for each part. While extended machining times are commonplace on materials like inconel 718, we were confident we could improve. By applying a smaller RCGX09 insert, we profiled the two grooves in a cycle time of three minutes 30 seconds, a huge reduction from the previous time of 22 minutes. Again, this was achieved by maximising the properties of the NTK SiAlON grade to increase surface speed from 30 to 250 m/min, the spindle speed from 64 to 530 rpm and the feed rate from 13 mm/min to 106 mm/min."

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New threadmills from Guhring

When it comes to holemaking and threading, Guhring has a product range that stretches beyond convention. This range has now been expanded with the arrival of the MTMH3-Z. An expansion of the Drifter series of thread mills, the new MTMH3-Z Drifter helical drilling thread mill demonstrates impressive performance levels when processing materials up to 66 HRc.

Combining core drilling and threading in a single operation, the MTMH3-Z Drifter helical drilling thread mill delivers excellent machining results and process reliability when wet or dry cutting all material types. With two oil grooves on the shaft to provide optimum cooling with cutting fluid or air; the range also has a left-hand cutting geometry that stabilises performance during climb milling. This is complemented by the fine-grain high-performance carbide composition that gives the MTMH3-Z Drifter stability and performance that is unrivalled.

The special fine-grained carbide is characterised by its high hardness and is optimally suited for hard machining. Supplementing this is Guhring's special temperature resistant TiSiN coating that prolongs tool life and performance whilst making wet, as well as dry machining possible. Furthermore, the MTMH3-Z Drifter incorporates a special face geometry with hollow grinding and this generates process-safe core hole drilling and thread milling possible in almost all material types.

With a shank diameter from 3 to 12 mm and a neck relief from 5 to 40 mm, the new thread milling series is suitable for creating threads from M2 to M16 on a material range that includes all steels and stainless, duplex, cast and graphite iron, aluminium and Ti alloys. Suitable for drilling and threading holes up to 2.5XD in a single operation, the MTMH3-Z Drifter can drastically reduce setups, cycle times, tool inventory and costs for end-users.

To simplify the process further, Guhring has also developed its CNC Guhro Thread Mill software that is free to download for Guhring customers.

This innovative software enables users to specify the thread data by selecting from all current thread standards and then inputting the material to be machined. At this stage, the software provides the optimal parameters. The CNC Guhro Thread Mill software also allows users to record the CNC data according to their required milling strategies and parameters. From here, users receive their desired CNC programming code and datasheets. The user simply has to import the programming data that is automatically recognised in CNC control units.

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Metalworking fluid update for effective hand protection in the machining sector

Skin-friendly 700 series from Rhenus Lub combines health protection and cost-effectiveness

Hands are now brought into focus more than ever before due to intensive washing and disinfection. Although this is good for hygiene, it does take its toll on skin health. Frequent washing damages the skin's natural protective acid mantle, leaving it hardly any time to regenerate. This can be particularly problematic for metal machine operators, as the already severely irritated skin is further stressed when in contact with metal working fluids. The risk potential for skin conditions and the resulting absences from work are on the rise. It is better to use skin-friendly products that preserve the skin's protective acid mantle as much as possible and have a preventive effect, just like Rhenus Lub's 700 series. The water-miscible metal working fluids are extremely skin-friendly and their performance and price are also impressive.

Growing awareness of active skin protection

The change in thinking in the industry is noticeable. Although effective skin protection has previously only been a minor issue for many production managers, awareness of skin-friendly lubricants is growing, as Daniele Kleinmann, head of product management for metalworking fluids, explains: "More and more production managers are examining how they can better protect the skin health of their employees. With our water-miscible metalworking fluids from the rhenus 700 series, we are helping those who want to actively counteract the rise in stress to the skin and ensure better skin health for their employees, all at a good price."

Versatility is the key to this. Besides universal products that can be used for a wide variety of applications, the rhenus 700 series also includes special products that can be used for grinding and demanding materials such as aluminium alloys and zinc.

Kind to the skin and the wallet

The products from Rhenus Lub's 700 series combine everything that modern skin protection requires. They are free from amines and extract less liquid and oil from the skin, thus reducing the damaging effect. Thanks to the relatively low pH values, the rhenus 700 series is particularly kind to the skin.

The rhenus 700 series not only makes active skin protection possible at attractive prices, as a result of the reduced stress to the skin, skin irritations, allergic reactions and costly secondary conditions can also be minimised. This is a key economic factor, as studies show that about one third of all skin conditions confirmed as occupational illnesses are caused by lubricants.

The rhenus 700 series at a glance

- **rhenus FU 700**
  High performance metal working fluid, also suitable for use in non-ferrous metals
- **rhenus FU 710**
  Universal metal working fluid, also suitable for grinding under conditions critical to foam
- **rhenus FU 720**
  Universal metal working fluid, also suitable for soft water
- **rhenus FU 725**
  Universal metal working fluid with long-term stability
- **rhenus FU 730**
  High-performance metal working fluid, suitable for materials prone to staining such as aluminium alloys and zinc, among other things

Rhenus Lub is an international system provider of special lubricants, application consulting services and process solutions for metalworking and metal processing. The company, which was founded in Mönchengladbach, Germany, in 1882, develops and manufactures water-miscible metalworking fluids and neat oils for demanding machining applications, special products for metalworking and special greases as well as special oils for lubricating roller bearings and other industrial components. Its customers include leading companies in the mechanical engineering industry, the automotive and automotive supply industries, and the roller bearing, food and aerospace industries.

As an innovation leader, Rhenus Lub invests an above-average amount in research and development, with over 20 percent of all employees working in this area. Rhenus Lub is represented in over 40 countries around the globe through its subsidiaries and other representative partners abroad.

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Lubrication equipment manufacturer produces prismatic and pressed parts on new lathe

Established in 1942, Coventry-based Adams Lubetech is member of a leading European group of specialist manufacturers of single-point and centralised lubrication equipment for OEMs in the food and beverage industry, compressor and conveyor sectors and across industry in general.

Consistently rising sales worldwide meant the company needed extra production capacity. So in early 2020 the firm purchased its first lathe from Citizen Machinery, a fixed-head Miyano BNJ-51 turn-mill centre, to machine not only rotational parts but also components that were previously produced on a manual mill or a power press.

Eric Chambers, factory manager at Adams Lubetech explains: "With these parts in mind, we wanted a powerful, rigid turning centre that was equally capable of milling. We selected the Miyano bar automatic primarily due to its competitive price.

"The first purely prismatic component we produced on it was an anchor block for our sister company in Belgium. We were milling and drilling the steel blocks manually in several operations, which was time-consuming, so we decided to use the Miyano as a chucker to produce them automatically.

"The support provided by Citizen's applications engineers was brilliant. They helped us enormously by developing the process, writing the program, and setting up the machine including replacing the chucks and jaws to fixture the part. They even came on site for three days to oversee production of the first-off components."

The lathe effectively doubles as a CNC machining centre in this application. Each part, which has large threaded holes and smaller diameter holes machined into multiple faces, comes off the machine complete in a cycle time of 139 seconds.

The Miyano is also taking work from a power press in the Coventry factory, resulting in even greater advantages. A deep-drawn part previously required seven

sequential operations, removal for skimming on a capstan lathe and return to the press to be slotted. Lead-time was more than one month to produce a typical batch of 8,000 and there was a lot of manual intervention for inter-machine handling. The same part is now produced in one hit from bar on the twin-spindle Miyano in 2.5 minutes, so the entire batch can be finished and shipped in a fortnight if the job is left to run 24/7.

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ROCOL cuts coolant consumption at Brown & Holmes

As a precision machining subcontract manufacturer and workholding specialist, Brown & Holmes supply high-quality services to blue-chip companies and Tier 1 suppliers throughout the UK, Europe, Asia and the US. With decades of experience delivering machining services to the automotive, aerospace, machine tool, construction, power generation and nuclear industries, the Staffordshire Company relies on cutting fluid solutions from ROCOL to keep its machine shop running at optimum levels.

With a plant list that includes milling, turning, grinding, jig boring and grinding, 3D printing and wire erosion, the Tamworth company applies machines from XYZ, Mazak, Doosan, Myford, Jones & Shipman, Colchester, Sodick and many others to machine an equally diverse range of materials. The challenge with such diversity is selecting a suitable cutting fluid that can perform on all types of machine tools and materials and this is where ROCOL steps in.

As a company that places quality and environmental sustainability at the top of its priority list, Tamworth based Brown & Holmes is an ISO: 9001, AS: 9100D, ISO: 14001 and OHSAS: 18001 certified manufacturer. With such an emphasis on quality, selecting the right cutting fluid is essential. As Brown & Holmes CNC programmer Michael Gulliver says: "We are a global precision workholding company and we also work closely with prestige companies like Rolls-Royce. We have been using ROCOL fluids for almost 10 years now and their products are excellent. We have a great relationship with ROCOL and if we have any concerns regarding our fluids, they are immediately on-site curing any problems we may have."

Applying the ULTRACUT EVO 250 long-life soluble cutting fluid throughout the Tamworth site, Michael Gulliver continues: "The ULTRACUT EVO 250 is excellent and it has made a significant improvement to our tool life. We have used various other products in the past, but the performance and longevity of the ULTRACUT EVO 250 fluid are significant, it makes a very clear impact on our tool life performance, increasing our tool life and cutting data significantly."

With the ever-increasing introduction of high-speed machining and the onset of coolant evaporation, Michael Gulliver adds: "As well as improving machining performance, the ROCOL ULTRACUT EVO 250 demonstrates a noticeable difference with evaporation. Previous fluids would easily evaporate within the machine envelope and the wider work area, this is not the case with the ROCOL fluid. Our shop floor team have also noticed a difference with the smell in the machine shop. There used to be an odour in the machine shop from our cutting fluids, but this is now a thing of the past."

As a manufacturer with a huge emphasis on environmental sustainability and employee health and wellbeing, the application of ROCOL ULTRACUT EVO 250 is paying dividends for Brown & Holmes. Suitable for use with a diverse range of ferrous and non-ferrous materials, ULTRACUT EVO 250 provides a long and predictable sump life and is installed throughout the machine shop at the company premises.

This prolonged sump life and the elimination of shop floor odours is down to several factors. Firstly, the high-performance fluid rejects tramp oil which when removed/skimmed off eliminates the main food source for cutting fluid born bacteria. The fluid itself is inherently resistant to degradation thanks to the biostable makeup of the product. Also, it contains no biocides or skin sensitisers which makes this particular cutting fluid very operator friendly. ULTRACUT EVO 250 is suitable for both individual or centralised cutting fluid systems and it is both pleasant and safe to use. However, what sets ROCOL apart from its rivals is the Ultracare service and support.

With experienced Ultracare service engineers that cover the UK to provide a world-class cutting fluid service package, Ultracare service engineers have been extensively trained in the care and maintenance of cutting fluids to keep fluids in optimum condition. This service includes a unique customised care and maintenance programme that ensures all cutting fluid requirements are achieved. The productivity results of the Ultracare service are reduced fluid consumption, extended tool life, reduced machine downtime and significantly reduced waste disposal costs; all factors acknowledged by Brown & Holmes. Ultracare service helps towards HSE compliance and provides a safer working environment for all Brown and Holmes employees.

Michael Gulliver concludes: "We have Ultracare engineers that come to us every month and we find this very comforting. It gives us peace of mind that the product is being looked after and it's one less thing that we have to worry about or check on, as ROCOL engineers do it all for us. They will inform us of any problems and they will resolve them immediately to ensure our fluid is always in prime condition."

The Ultracare service provided to Brown & Holmes sees engineers checking machine tools every month to ensure optimal machining conditions are maintained at all times. This service includes the checking of everything from the materials being machined and the cutting tool consumption to initially determine the most suitable fluid for the respective machine and application.

With UK laboratories based on the outskirts of Leeds, ROCOL will test existing fluids and neat oils in the machine tool before recommending a solution. This includes performance, bacteria and fungal tests. Once a machine has been filled with ROCOL fluid, the Ultracare team regularly conduct site visits that encompass everything from fluid levels, dilution rates, pH levels and complete reporting with a programme that has been tailored to each end-user with all recommendations and corrective action undertaken. With complete reporting, this service enables quality and environmentally conscious companies like Brown & Holmes to remain compliant with Health & Safety regulations.

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Leader provides the drive to improve productivity with Tecnologie FRB

Established in Italy in the early 1960s, Tecnologie FRB designs and manufactures live centres and face drivers for turning, gear cutting, and grinding applications. The company has built an enviable global reputation in this sector and its comprehensive product ranges are now available in the UK and Eire from workholding and ancillary manufacturing product specialist, Leader Chuck International.

Managing director of the recently appointed agent, Mark Jones explains how FRB has built its reputation: "When Romano Franceschelli founded the company, he used his experience as a turner and exceptional engineer to initially design a live centre that would reliably address all the issues he faced as a lathe user.

"Reliability would be the best word to describe FRB. Reliability of the products, of delivery, of the services offered and the response times for any customer requirements. These are the cornerstones on which FRB has based its production. So, the reliability of a technical solution and subsequently, of a finished product, is undoubtedly linked to innovation. Innovation linked, in turn, to technological evolution within the manufacturing sector, which, in turn, drives change."

Products started with the FRB patented 65, 80 and 85 live centre series, with axial load distribution and continuous research and development, has resulted in the more recent series of 2000, 2006 for high-speed turning and 2008 for hard turning. With high quality steel integral shafts available, with or without carbide tips, interchangeable inserts and cone shaped heads means Tecnologie FRB's live centres offer a tangible solution to manufacturing industries' requirements.

A complete range of revolving live centres is available, equipped with morse tapers in different sizes, both with standard and special features to fulfil most requirements.

The company's constant quest for innovation has seen it excel in a wide range of mechanical processing, from conventional and CNC turning and gear cutting to the more demanding cylindrical grinding and tooth grinding applications.

Live centres for grinding are in the 92 series and include the models for pipe grinding and the dead centre series for hard metal applications. For gear cutting, the 82 series live centres provide axial and radial load with roller bearings.

A comprehensive range of face drivers for turning, grinding and gear cutting applications is also offered, with FRB having developed its first model back in 1965. "The range of face drivers can fit any workpiece holder from five to over 300 mm diameter," explains Mark Jones. "From the classic spring-operated system, right up to the most advanced hydraulically powered system. FRB patented balancing and holding system, which is completely mechanical and technologically state-of-the-art, always guarantees absolute reliability, constant repeatability of results and unparalleled holding capacity."

Thanks to the introduction of face drivers, turning and grinding processes have undergone a number of innovative improvements that have resulted in shorter cycle times for many workshops. The driver acts directly on the workpiece so the cutting tool or abrasive wheel has increased access to the whole part. With none of the raw material being held in a chuck or similar device, it is often possible to finish parts in one hit, minimising any potential datum

errors from repositioning for second operations and so on.

At its plant in Bologna, Italy, highly qualified staff use an advanced manufacturing system to produce FRB Live Centres. From the original series right up to the latest versions, for different axial loads from classic turning and gear cutting to the most demanding of external grinding and gear cutting production. FRB Face Drivers are also produced here.

New state-of-the-art machine tools, such as twin-spindle lathes with three automatic tool changers and bar feed, are used for turning and milling. These can carry out multifaceted machining tasks aimed at producing complex components supported by the inhouse CADCAM team.

The grinding department is equipped with multi spindle machines for external and internal machining in a single setup to support production and manufacturing requirements, achieving the necessary geometrical tolerances for both form and finish. Finally, a fully automated warehouse system ensures stock levels are matched to demand.

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Lehmann provides 'all-round' machining solution to Rotron

Rotron Power Ltd, a specialist designer and manufacturer of innovative rotary engines, has purchased an advanced pL Lehmann CNC rotary table to support its machining activities.

Established in 2008, Semley, Wiltshire-based Rotron Power has grown rapidly to become a major force in the supply of rotary engines for Unmanned Aerial Vehicles (UAVs) and increasingly for other applications. When compared to traditional rotary power plants, the efficient fuel burn characteristics of Rotron's, high power density, low weight engines, provide impressive endurance lifecycles and increased range capabilities.

The cutting-edge R&D work that has resulted in Rotron's global success within the UAV sector has enabled further aviation applications to be exploited. For example, the company has developed VTOL, an unmanned Quadcopter lift platform designed for transporting a variety of payloads, also SKYQUAD, a flying car that is equally at home in the air or on the ground. Recent non-aviation projects include a high performance, multi-fuel marine outboard rotary engine and a bespoke two stroke engine for a powered surfboard. The latest application for the company's advanced rotary engine technology is an innovative racing motorcycle which produces 204 hp and weighs less than 130 kg .

In addition to developing the company's own proprietary technologies, Rotron acts as an advanced design and analysis engineering consultancy to a wide range of international businesses. Along with other services, the company provides concept development, engineering, prototyping and production management.

As Rotron's consultancy contracts specify that staged payments are made by clients on the completion of specified design and development steps, the time taken to arrive at these milestones is extremely important. Some of these payments are made on the presentation of prototypes and of fully operational products. Therefore, in addition to the efficient manufacture of Rotron's own products, the speed and flexibility of the company's machining activities is vital to the commercial success of the business' consultancy operations.

Rotron's cutting-edge production capabilities are supported by the employment of skilled staff and by the use of a wide range of highly-efficient XYZ CNC machine tools. To enable further machining efficiencies to be gained, the purchase of a CNC rotary table was recently considered. Following a conversation with staff at XYZ Machine Tools, a decision was made to purchase an advanced pL Lehmann T1-510520 model.

Rotron production manager Sam Bellefontaine explains. "As we need to efficiently machine parts with demanding levels of precision, we have invested in a range of cutting-edge XYZ machine tools. Our use of XYZ's advanced machine tools has enabled us to develop an extremely efficient manufacturing operation and over several years we have received excellent training and outstanding technical support from the company. Therefore, when the need occurred to purchase a rotary table, we were happy to take advice from XYZ's technical staff and to invest in a pL Lehmann T1-510520 unit.

"The installation and interface help we received from XYZ and from Paul Tolin, pL Lehmann's local service agent, helped to put the T1-510520 into use and enabled us to gain maximum benefit from the CNC rotary table. The machining flexibility and speed that our pL Lehmann rotary table has delivered is now proving invaluable.

"Given the complex nature of many of the parts we manufacture, before using our rotary table we would need to perform two to three different machining operations on them. Now, thanks to the 'all-round' machining capability delivered by our pL Lehmann rotary table, we can complete the same machining work in a single hit. In addition, we no longer have problems related to the accurate relocation of workpieces for secondary machining operations. These factors have helped us to maintain our high precision standards and to slash the machining times of many of our components.

"The relatively small footprint of our pL Lehmann rotary table means that, when it is mounted inside our XYZ machine tool it occupies a minimum area of its bed. As well as leaving room for the fitting of additional workholding on the machine's bed, the compact size of the rotary table means that even when it is not required, we can leave it inside the machine whilst other milling and drilling work is being performed. Also, when

we are not using it, the rotary table's low profile helps to increase the available working volumes of the machine."

Throughout the world, production costs are constantly under pressure and therefore companies are continually searching for rapid, lean manufacturing solutions. Increasingly, the use of advanced CNC rotary tables is being seen as a way of achieving highly-efficient machining. For example, as it is estimated that 90 percent of all machining tasks performed by 5-axis machining centres are basic five-sided procedures, rather than purchase an expensive 5-axis machining tool, the fitting of a rotary table to a company's existing 3-axis VMC represents a cost-effective, technically capable alternative means of achieving highly effective 3+2 axis capabilities.

As a CNC rotary table costs a fraction of the price of a 5-axis machining centre, the use of this flexible machining aid is being embraced by increasing amounts of manufacturers. Following the fitting of a CNC rotary table, users report that their enhanced capabilities, reduced machining times and increased outputs provide rapid returns on their investments.

pL Lehmann CNC rotary tables are available in four sizes: 507, 510, 520 and 530 mm with centre heights from 110 to 240 mm. Thanks to the company's innovative modular design approach, from these four basic size options it is possible to create over 170 different rotary table variants, from basic single-spindle 4th axis units to 4-spindle tilting rotary tables with 4th and 5th axis capabilities. Therefore, rather than purchase a 'nearest-fit' option, pL Lehmann's customer focussed approach ensures that each purchaser receives a high-quality CNC rotary table that exactly matches their specific needs.

In addition to solving todays machining challenges, the company's modular design system means that the purchase of a well-engineered pL Lehmann CNC rotary tables represents a safe, future-proof investment. For example, if customers' requirements change, rather than invest in a new rotary table, their existing pL Lehmann units can be easily amended to accommodate any changes of use.

pL Lehmann's standardised spindle arrangement allows the use of an extremely wide range of workpiece clamping systems. As a result, in addition to standard workholding being set up for an initial workpiece range, the system can be quickly converted to accommodate other workpieces.

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Hainbuch launches small 'quick change' interface

The Centrotex quick change-over interface from Hainbuch has set new standards since its market introduction and now, the proven system is available in a new version for smaller machine spindles. Recognised as the smallest available system on the market for setting up clamping devices in a matter of seconds, the quick change Centrotex S has a diameter of just 224 mm.

The new Centrotex S is the perfect solution for eliminating non-productive downtime, setup time and job changeover times that are often increased when access to a compact work envelope can be restrictive on operator movement and access. With its fast change-over system and compact design, the new Centrotex S eliminates excessive setup times and it is the perfect solution for compact machine tools with a small work envelope.

With repeatability better than ≤0.002 mm on the interface without having to re-align, the latest addition to the Centrotex family of 'quick change' systems can also meet the most rigorous of industry requirements. The machine adaptor is mounted on the spindle and the clamping device is equipped with a counterpart adaptor that can be exchanged for another clamping device in less than a minute. This exciting new system makes long setup times a thing of the past, providing end-users with a fast, efficient and user-friendly interface that significantly reduces non-cutting times.

The smallest Centrotex S incorporates the proven technology of the established Centrotex platform while demonstrating superior levels of convenience. The Centrotex S is actuated via just one radial locking screw and ergonomic operation has been significantly improved, thanks to the fewer rotations required to tighten and clamp the system. In addition, the Monteq changing fixture contributes to a faster clamping device setup. The new Centrotex S is perfect for clamping parts typically up to 52 mm diameter and is suitable for A2-5, A2-6, AP140 and AP170 spindle nose systems.

The compact design makes the new Centrotex S the ideal solution for small turning centres and machining centres where operator access can be a considerable challenge in a compact work area.

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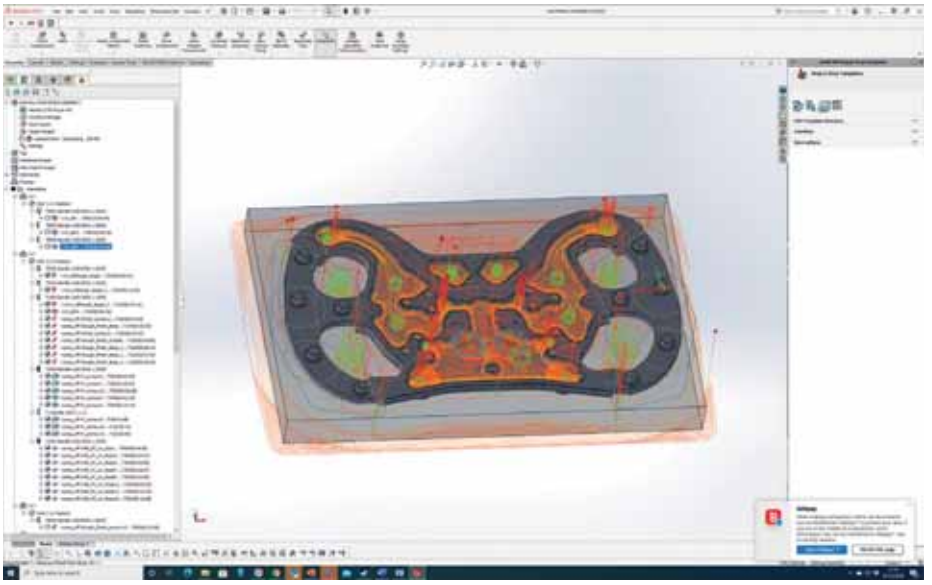
Huge savings on tooling costs with iMachining technology

Machining parts to precise specifications, with no room for mistakes, is imperative in the manufacture of race cars. It was therefore no surprise that Cambridgeshire-based race car specialist, CTR Developments, that is heavily involved with groundbreaking engineering for Tier one manufacturers, sought out a CAM system that would enable them to meet their customers' demand for the highest precision and machining quality, including flexibility and fast turnarounds. As a result, the company chose the integrated CAM Solution, SolidCAM with iMachining.



Dr Matthew Chamberlain, company secretary at CTR Developments says: "I am not a machinist and I have never been formally trained, but I wanted to take control over the bits and pieces we were sending out to be manufactured. The one-button-click to calculate 3D roughing cutting paths was a revelation, it just worked. The surface finish we get on the 2D finishing passes from IMachining are also better than anything we were able to previously achieve."

Although iMachining helps companies to save 70 percent and more in machining time, this was not in fact what attracted CTR Developments to purchase. Being first and foremost made up of racers, the motorsport company's main focus is quality.

Dr Chamberlain continues: "We don't run our machine hard and are not interested really in time savings, but the life on the tools is important and I know it has saved a good number of accidents. Although we have seen a significant reduction in time compared to how we used to machine, it's all about quality for us, but it definitely saves 'bang ups' and general tool wear."

However, having the reduction in machining time, means that CTR Developments can get a prototype to its customers before they commit to expensive tooling, so although not at the forefront of importance, time savings is still an important factor.

The patented, revolutionary and unique iMachining technology avoids machine downtime, as there is less wear and tear on CNC machines resulting in higher machine up time, reduced machine maintenance costs and extended machine life. Full depth of cut ensures that the entire tool is utilised rather than only the bottom part, so that average tool life is increased by five times or more and the cost for unnecessary premium and speciality tooling for hard materials can be eliminated. Materials used by CTR Developments include the hard alloy, aluminium 7075 T6, using a Hurco VM10i and mostly AluPower cutters for parts such as suspension uprights and steering wheels.

Dr Chamberlain continues: "We have not invested in shrink type chucks and still use the more traditional high-quality collets. That said, we are still able to hold more than enough accuracy for bearing fits in things like the uprights."

Part sizes range from a bell housing at 400mm by 300 mm by 250 mm to a suspension breakoff 50 mm by 100 mm by 50 mm. The Upright's dimensions are 100 mm x 450 mm x 250 mm and the steering wheel's dimensions are 25 mm x 200 mm x 300 mm. CTR Developments has experience in virtually all classes of motorsport from Formula 1 downwards and can design anything from a sump tank to a complete chassis. Its experience with the Porsche Flat 6 engine makes it the builder of choice for these engines. Using iMachining, means zero air cuts when machining the parts, as toolpaths are driven by dynamically updated 3D model of stock and the 3D model of stock is precisely updated after each short segment of tool movement.

"With SolidCAM I am always using iMachining as much as I can. It's simple, the iMachining module has saved us money and SolidCAM UK are always more than happy to go the extra mile when I ring up with questions and have never left me hanging, even over the holiday period," explains Dr Chamberlain.

The iMachining's unique Technology Wizard, generates automatic optimal feeds and speeds eliminating trial and error to find the optimal machine settings, keeping the tool at maximum efficiency.

"We don't have to specify any feeds/speeds. It just calculates it all by itself. It's made all the difference as it takes away the human error risk, even if you have perfect cutting parameters for the given tool and material," adds Dr Chamberlain.

With over 40 years design experience, SolidWorks premium is CTR Developments' CAD system of choice. Therefore, it was a no-brainer for it to invest in a CAM solution that ran directly within its existing SolidWorks, providing seamless integration and full tool path associativity, with an extremely short learning curve due to the familiar environment.

Dr Matthew Chamberlain concludes: "The full integration of SolidCAM into SolidWorks just made everything easy; no intermediate filetypes, auto model update and it feels comfortable, as we have been using SolidWorks for 15 years now, so it's not a new interface to learn, which meant we were up and running faster and less likely to make geometry errors."

CTR Developments has been using SolidCAM & iMachining for over three years now and consider it to be a continuing asset to its business.

SolidCAM is a leader in integrated CAM and its CAM software is fully integrated in SolidWorks. Its integrated CADCAM solution supports the complete range of major manufacturing applications.

SolidCAM's patented, unique revolutionary iMachining 2D and 3D technology saves 70 percent in CNC machining time and more and extends tool life dramatically. The unique iMachining Technology Wizard, provides optimal feeds and speeds, taking into account the toolpath, stock and tool material and machine specifications. iMachining provides unbelievable savings and increased efficiency in CNC milling operations, translating into profits and success.

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Solving the problem of porosity in additive manufacturing

Additive manufacturing is revolutionising manufacturing in a number of industries, yet it is still subject to porosity, a well-known challenge that causes leak paths and can lead to high value components being scrapped. Commercial sales director from Ultraseal International Group, Dr Mark Cross talks about how additive printing consultancy Graphite AM overcame this issue after partnering with Ultraseal International.

Additive manufacturing, commonly known as 3D printing, enables the fast and cost-effective production of complex high-quality components in a range of materials. The rise of this technology has been fast and it is rapidly altering the manufacturing landscape.

According to Deloitte, additive manufacturing is empowering industry 4.0. In 2019, the global additive manufacturing market size was valued at $11.58 billion and is predicted to grow at a Compound Annual Growth Rate (CAGR) exceeding 14 percent from 2020 to 2027.

3D printing has evolved from a revolutionary technology into a mainstream process and is now being used across a wide range of industries. From aerospace relying on additive manufacturing for functional aircraft components to automotive using it for grips, jigs and fixtures, 3D printing has seen a significant growth in applications and it's easy to see why.

Thanks to its clean and simple process, 3D printing produces high quality components and removes the need for expensive tooling and machining. Additive manufacturing is not only ideal for small and intricate parts,

but it is also a cost-effective and quick way to produce prototypes, one-offs and components in low volumes.

A pinhole porosity problem

However, as the manufacturing technology evolves, a legacy challenge still remains: porosity. During additive manufacturing, microscopic holes that are invisible to the naked eye are formed within the body of the part. Porosity is an inherent issue with diecast components and while the cause and application might be different, the end result is always the same and that is scrappage.

Typically, porosity is caused either by the printing process itself, or by the powder used in the process. These microscopic voids reduce the density of components, leading to cracks, leaks and fatigue. For parts that go into applications which need to be air or fluid tight, for example in fuel or cooling systems, this can be an especially critical issue.

Vacuum impregnation

One way that additive manufacturing businesses can reduce the cost, waste and productivity impact of porosity is by working with porosity sealing experts who have the perfect solution: vacuum impregnation. This proven process prevents gases and fluids from leaking through a component by sealing any voids with a chemically and thermally resistant polymer sealant.

3D printing consultancy Graphite AM wanted to ensure its customers were getting the best product quality and recognised they needed to pair with a porosity sealing partner in order to do so. It chose to partner with Ultraseal International, a leader in the development, manufacture and supply of porosity sealing chemicals, impregnation equipment and services.

Porosity sealing for complex components

Specialising in complex designs and high-performance components in tailored materials, Graphite AM primarily uses Selective Laser Sintering (SLS), an additive manufacturing process which deploys lasers to sinter powdered material, binding it together to create a solid structure.

While the majority of 3D printing bureaus use standard or glass-filled nylon materials, such as PA11 and PA12, Graphite AM has developed its own range of unique SLS blends, including the use of fine graphite particles. As well as having impressive anti-static properties, the use of graphite also improves impact and thermal resistance, up to 170°C, meaning it is particularly suited to lightweight applications where strength and performance are critical factors.

This includes components for automotive applications, turbo system components, plenum chambers, oil and water pipework and manifolds, fuel cells and electric vehicle battery cooling systems. Graphite AM also produce components for mission critical applications including environmental monitoring systems and Unmanned Aerial Vehicles (UAVs).

Partnering with Ultraseal International

Graphite AM chose to partner with Ultraseal International due to its proven track-record in the automotive industry and unrivalled experience and understanding of the component impregnation process. Ultraseal's solution involves sealing the component using vacuum impregnation, a process which uses three key stages that ensures the highest quality component sealing.

First, components are placed into an autoclave containing Ultraseal PC504/66 resin, a high performance thermocure sealant. The sealant is applied to the component under vacuum in an autoclave. Once components are immersed in sealant the vacuum is released. Through the resultant change in pressure, the sealant penetrates into the micro-porosities and leak paths within the 3D printed part and seals them.

Next, a cold wash module removes excess sealant from external component surfaces and tapped holes.

The third process stage is a hot cure cycle. This exposes components to heat for a predetermined time period using a hot water bath which polymerises the sealant, changing it from a liquid state to solid polymer by applying heat. As a further quality test, the components are pressure tested to ensure they are leak free.

Today, Ultraseal delivers an end-to-end sealing service for Graphite AM from its UK Service Centre in Slough. This has added real value to Graphite AM. Sales & marketing manager of Graphite AM, Jonathan Warbrick says: "Our customers

rely on quality components and we rely on Ultraseal to ensure they're sealed effectively against the problems of porosity.

"Our partnership means we're able to deliver reliable and leak free components, an essential characteristic in high performance parts. Ultraseal also delivers reliable and rapid turnaround. I've been impressed both with service, and product quality."

Making porosity problems a thing of the past

As additive manufacturing will play an increasingly important role in the manufacturing supply chains of the future, so too will porosity sealing technology. By adopting porosity sealing, manufacturers drive up throughput, reduce scrappage, minimise waste and increase efficiency and value.

Businesses have a variety of flexible options too when looking at incorporating vacuum impregnation into their operations. This includes on-site managed services, using external service centres, through to owning the equipment outright.

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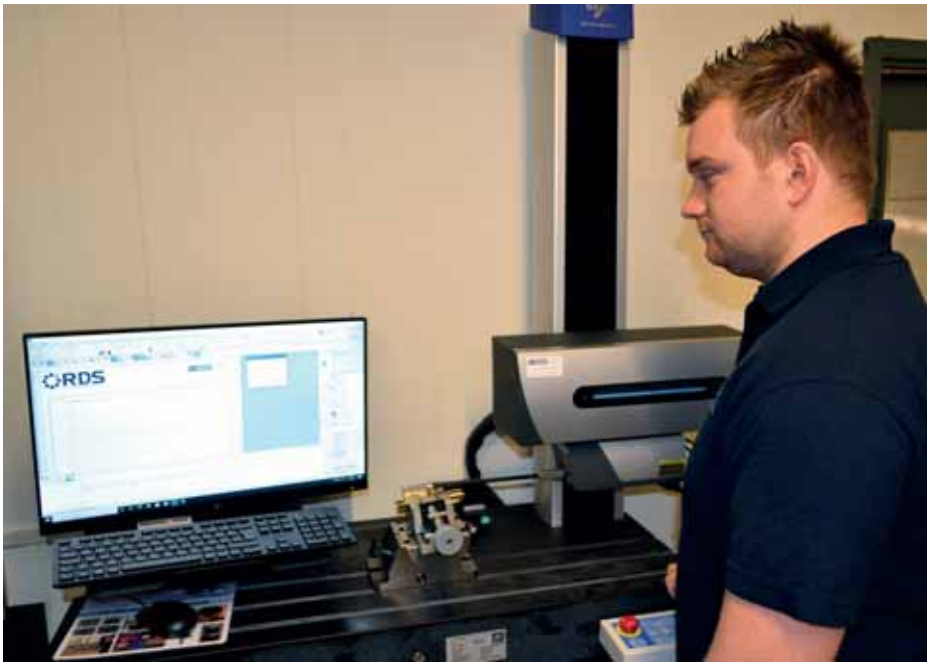
ACCRETECH machine proves to be invaluable

Given the intense competition between engineering subcontractors, it is often the businesses with unique selling points that stand out from the crowd. One such successful company is Washington, Tyne and Wear-based RDS Precision Engineering. In addition to establishing a reputation for delivering on time and on budget, the busy company's main differentiator is its highly developed quality ethos. To help ensure the premium quality of the company's output, regular investments are made in high-precision inspection equipment.

The latest addition to RDS Precision Engineering's impressive quality control department is an ACCRETECH SURFCOM NEX 041 CNC measuring station that provides the company with high-precision, two-dimensional contour and surface roughness measurement capabilities.

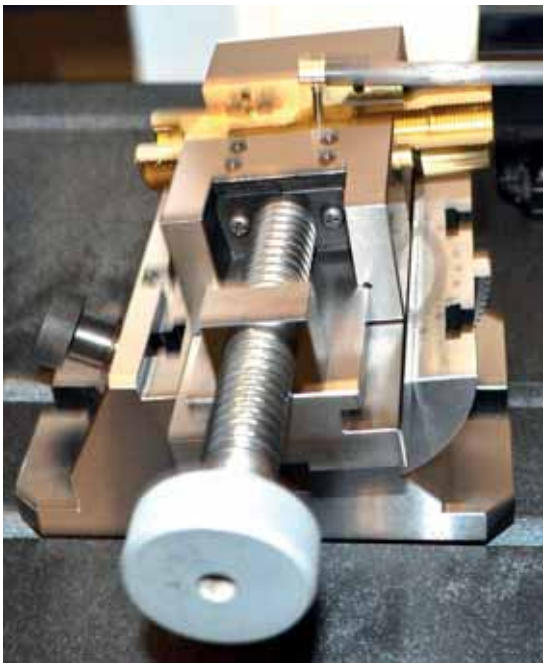


RDS Precision Engineering was established in 1991 by brothers Robert and David Bone with the aim of becoming a successful independent supplier of precision engineered components. Due to the quality of the company's output and the efficiency of its services, the business soon achieved its founders' ambitions. To enable RDS to increase its capacity and expand its range of precision manufacturing services, over the past three decades regular investments have been made in a range of CNC machine tools and advanced inspection equipment.

Explaining the recent ACCRETECH purchase, RDS Precision engineering director Rob Bone says: "A policy of regular investments has resulted in our skilled staff now having access to a wide range of fist-class inspection equipment. As a BS EN ISO 9001 certified business that counts many customers involved in technically demanding industries, quality has always been and, will continue to be, our number one priority.

"We use a selection of standard inspection equipment, such as CMMs and vision measuring systems. Also, given the demanding specifications and challenging dimensional tolerances of many of our components, we also use highly precise specialised metrology equipment, such as our recently purchased advanced ACCRETECH CNC contour and roughness measuring system.

"The decision to purchase the ACCRETECH system was a simple one. Some time ago, a major customer of ours searched the market for an easy-to-use CNC measuring station that could deliver high-precision, two-dimensional contour measurements, although several alternative systems failed to match the business' exacting standards, a SURFCOM NEX 041 proved to be the ideal solution.



"As we were recently looking to upgrade our inspection capabilities in this area, given our customer's exceptionally high precision standards, the in-depth research they had undertaken before their ACCRETECH purchase and, as a result of their recommendation, we also recently invested in a SURFCOM NEX 041."

The SURFCOM NEX 041 is an advanced, CNC measuring station that delivers high-precision, two-dimensional, physical contour measurement. Ideal for the manual or CNC, high-precision measurement of contour geometries on demanding applications, such as ball screws and large bearings, the advanced ACCRETECH system has an impressive contour measuring accuracy of ±(0.8+|2H|/100).

In accordance with ACCRETECH'S philosophy of providing the highest standards of precision with trouble-free operation, thanks to the use of kinematic magnetic holders, the SURFCOM NEX 041's contour styli can be swapped out effortlessly and with high positioning accuracy. To enable even the most difficult to reach workpiece positions to be inspected, a wide range of contour measuring styli are available.

Ideal for use by both novices and experienced quality control personnel, the user-friendly SURFCOM NEX 041's ACCTee operating software is extremely intuitive. In

addition to measurements being fully automated, the system's calibration and adjustment procedures are also simple procedures.

Rob Bone continues: "Following a trouble-free installation and operator training, as the SURFCOM NEX 041's operation is so straightforward our staff soon mastered its operation. Now in regular use, our new ACCRETECH machine is proving invaluable. For instance, we were previously using a shadowgraph to measure a regularly manufactured family of parts with demanding angular contour specifications and struggling to achieve the required levels of precision. Now, we are able to load each of these parts onto the SURFCOM NEX 041, recall the relevant program and instigate a precise, fully automatic CNC measuring routine. Not only has the ACCRETECH machine improved our precision standards related to these challenging components, it has also slashed the time taken to inspect them.

''In fact, as our contour inspection routines have been automated, now, after the operator has loaded each part onto the machine, he is able to perform other duties whilst waiting for inspection cycles to be completed.

"So successful has our use of our SURFCOM NEX 041 been, soon after its installation, we returned to ACCRETECH UK to purchase an additional T-stylus set that now allows us to make very accurate contour measurements inside small bores in both downwards and upwards directions. This allows us to measure complex geometries and diameters deep inside bores that were prevously very difficult or impossible to measure."

ACCRETECH designs and manufactures a wide range of high-precision, cost-effective instruments for the accurate and efficient measurement of workpiece surfaces, form and contours. Used throughout the world by quality conscious businesses involved in some of the most demanding industries, such as the automotive, aerospace and medical sectors, ACCRETECH products are found in both quality departments and in serial production situations on assembly lines.

ACCRETECH'S extensive range of contour measuring devices allow workpieces features, such as angles, radii, distances and coordinates to be quickly inspected with high levels of precision. Rather than using the ball screw and nut arrangement, employed in less capable systems, ACCRETECH'S products benefit from the use of advanced linear technology. This superior arrangement results in significant reductions in mechanical wear and ensures that all products retain their accuracy specification and remain maintenance free. These advantages provide users with considerable cost savings over the life of each system.

As many users' contour measuring needs differ, SURFCOM NEX machines can be specified with the addition of a wide range of modular accessories and sensors, guaranteeing the delivery of systems that exactly matches their intended use. The availability of these accessories and sensors means that ACCRETECH systems remain 'future-proof' as they can be modified as users' inspection needs change.

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Improved quality and accuracy of weld testing

Looking to keep its service in-line with customer requirements, Solus Testing Ltd was supplied with an Innovatest FALCON 507 Micro/Macro Vickers Hardness Tester from the Bowers Group.

Solus Testing Ltd is a mechanical and Non-Destructive Testing (NDT) laboratory based in Worksop, Nottinghamshire, carrying out weld procedure qualification records and welder qualification to ASME IX @ BS EN standards. It also provides material testing for engineering organisations and manufacturers of pressure vessels, rolling stock, bridges, lighting columns, iron and steel founders, power stations, structural steel work and the oil and gas pipeline industries.

For Solus, quality and accuracy are the most important aspect of the service that its customers require. In this particular instance, the FALCON 507 is utilised to carry out weld testing, allowing confirmation of any changes to the properties that may have occurred during the welding process.

The testing of welds allows users to achieve an indication of two important parameters significant to the determine a

successful weld joint, first being its strength and functionality and second, the microstructure of the material. Testing on a weld's heat affected zones must be particularly precise, usually obtained on a microscopic scale, to ensure absolute safety of the finished product.

The FALCON 500 series provides users with Micro Vickers, Vickers and Micro Brinell hardness testing functions, improving conventional methods by focusing on eliminating user influence on the test results. The unique force actuator system utilises an electronically controlled closed-loop system and advanced force sensor technology to achieve its high accuracy.

With its automatic indent measurement, two indenter positions, four objective positions, five megapixel HD camera and anti-collision system, the FALCON 507 series offer absolute accuracy reliability and repeatability, on each of the forces used for a test.

Solus operates the FALCON in a laboratory setting allowing the hardness testing process to be carried out in a space where external factors cannot affect the results. The machine is in constant use and with its high workload, it is important that the testing instruments can cope with the demand.

The technicians found the machine easy to operate, that it copes well with the workload and the results that it produces are both accurate and reliable.

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ESAB Europe Xpanse virtual welding and cutting event

Featuring 50+ products, expert access and educational classes

Worldwide welding and cutting expert ESAB has announced that from 27th to 29th April it will hold ESAB Europe Xpanse, a virtual event that will showcase the industry's broadest line-up of new welding and cutting systems, filler metals and related technologies. By visiting **www.esabxpanse.com**, visitors can tour a virtual trade show stand, chat live with product and process experts, watch videos on products from influencers, participate in ESAB University online classes and take a walk through its hall of history. Materials for the event will be available in English, French, German, Italian, Spanish and Polish.

"ESAB Europe Xpanse is the antidote to the typical Teams meeting or Zoom call," says Cheron Robinson, regional MARCOM manager Europe. "We are taking the concept of a virtual trade show to a new level and will provide an industry-first-of-its-kind immersive experience to introduce dozens of new welding and cutting products. Until we can gather in person, there will be no other event to rival the resources available at ESAB Europe Xpanse."

A virtual stand

ESAB Europe Xpanse mimics the company's real-world trade show stand, which features different product and technology centres to explore. Visitors can tour the stand with their mouse and keyboard, use an overhead map view to visit specific areas or take a guided tour based on preference. Because in-person gatherings are not an option in the era, ESAB has created more than 50 videos with its product and technology experts. During show hours, from 9am-8pm. CET, the Xpanse stand is staffed with experts to answer questions via a built-in chat function.

To learn more about a product, visitors can download product fact sheets, brochures and watch influencer videos. Additional content is available in a carousel-style photo album, offering a multitude of product photos such as the operator interface, accessories and other key product features.

Classes

The virtual event also features ESAB University, ESAB's extremely popular dedicated learning area in its real-world trade show stands. The complete alendar of events is available at **www.esabxpanse.com**

"Courses will be made available to stream immediately after they premiere," explains Cheron Robinson. "All of the ESAB University classes will be staffed with live personnel to answer questions real-time, encourage feedback and create community with our participants. By connecting our people, processes and technology, we aim to show visitors how they can shape the future of their business with ESAB as their partner."

Featured product areas

ESAB will highlight the following product areas and much more during ESAB Europe Xpanse:

• Cutting automation: ESAB will showcase a variety of cutting automation solutions, such as the new Hydrocut™ HDX large-gantry waterjet cutting system and Auto Drill 30 fully automated drilling system.

• Heavy industrial systems: for productivity, reliability and energy-efficient operation the most demanding applications, ESAB has introduced the Warrior® 750i CC/CV power source, 750 amps at 100 percent duty cycle, Aristo® 500ix CC/CV pulsing power source and Fabricator EM 401i, 401iw and EM 501iw inverters.

• Wire feeders: the new Robust Feed Pulse and Robust Feed U6 wire feeders offer the industry's only IP44 "rain proof" rating, provide unmatched durability and provide shop-level performance and control in a durable and highly portable package.

• Torches: recently introduced torches include the gas-cooled MXH 315PP and water-cooled MXH 420W PP push-pull systems created for Robust Feed Pulse and Aristo Feed 3004 wire feeders.

• Portable MMA and TIG inverters: Rogue is a news series of compact and lightweight, less than 10 kg, MMA/TIG inverters that will cause users to rethink their perception of power, arc performance, control functions and price.

• Manual plasma cutters: the ESAB Cutmaster® 40 manual plasma cutting system offers a rated output of 40 amps at 35 percent duty-cycle and an outstanding power-to-weight ratio. For an advanced LCD interface that simplifies setup and operation, consider the HandyPlasma 35i and HandyPlasma 45i manual plasma machines.

• PPE: the Savage A40 Air with Powered Air Purifying Respirator (PAPR) technology provides heavy duty protection from welding fume and particulates and features the radical styling and optical performance of the Sentinel A50.

• Filler metals: ESAB new filler metals include Shield Bright NiCrMo3-T1, a 625-type electrode for manual and automatic flux cored wide-weave welding; a new series of B3 SC electrodes for SMAW, GTAW and SAW for 2.25 percent Cr 1 percent Mo alloyed steels, SA-387 Grade 22, A335 Grade P22 or similar materials; OK AristoRod 38 Zn wire to solve porosity and spatter issues in galvanised steel applications and OK Goldrox, a rutile MMA electrode that provides a stable arc that leaves almost no spatter; Exaton filler metals for duplex, hyper duplex and super duplex stainless steels.

• Digital solutions: ESAB's updated suite of online data management and analytic application to improve productivity and uptime includes WeldCloud Productivity for operation and production managers, WeldCloud Fleet for service and maintenance manager's and WeldCloud Notes for quality control and documentation. A new WeldCloud Connect application and Zebra handheld smart device/scanner make using WeldCloud even easier.

• Continuous tube and pipe welding: HKS Prozesstechnik, an ESAB brand, has introduced its ThermoProfilScanner (TPS) for non-destructive testing (NDT) solution. TPS utilises the seam's thermal profile for weld flaw detection, documentation and traceability.

• Mechanised welding for automated movement of GMAW, FCAW or plasma torches, ESAB offers a full suite of compact battery-operated tractors, including the Miggytrac B501, which now features digital controls and a precision AC stepper motor.

ESAB exists to shape the future of welding and cutting. We connect fabricators with the widest range of products under our industry-leading brand portfolio with the latest technologies to solve virtually any industry challenge, then we back it up with our knowledge, experience and passion to help them be more productive than ever before. To learn more about ESAB Europe Xpanse, visit **www.esabxpanse.com**.

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Concentrated welding expertise

Largest welding competence centre in Europe

The CLOOS application and process development department offers feasibility studies on customer components, the creation and optimisation of robot programs and advice on the selection of the optimal welding technology. Thus, it plays a central role in the development of customer-specific welding solutions and new welding technologies.

"In our welding competence centre, our specialists develop efficient solutions and innovative welding technologies that are tailored to the individual needs of our customers," says Christian Paul, head of application and process technology development at CLOOS, who has continuously expanded the department since the beginning in the 1980s.

Today, the department consists of 22 employees who always get the best out of the arc for customers in an area of 1,500 m². The specialists use the latest technologies for manual and automated welding. Whether TIG, MIG, MAG, plasma or laser hybrid, the competence centre covers the entire range of welding technology and can process all materials. Innovative processes such as additive welding are also used and continuously developed at CLOOS. A total of 12 robot systems with various peripheral equipment are available for tests and demonstrations. Complex components with a length of up to 6 m and a weight of up to four tonnes can be processed there.

With its comprehensive know-how, the specialists advise customers and colleagues on the selection of the optimum manufacturing process, welding process and welding technology.

The employees have extensive experience in the areas of welding, brazing, cutting, burning, brushing and cleaning, in the optimum selection of parameters, the properties and influences of filler materials and gases as well as in the many possible applications of sensor technology.

"In 1986, we already used the first laser sensor for online seam tracking on a 10-axis robot system," Christian Paul recalls. "Today, we can ensure the best possible weld quality with tactile gas nozzle sensors, arc sensors and online and offline laser sensors."

In addition, the topics of digitisation and networking are also playing an increasingly

important role in application and process development. Thus, all robot systems are networked with each other and equipped with the CLOOS digitisation platform C-Gate.

Focus on the optimum customer solution

A central task of the CLOOS application technology are feasibility studies both of the welding technology and with regard to the automation of production processes. Even before the actual start of production, CLOOS carries out extensive tests on customer components.

"Efficiency potentials, cycle times, areas of applications, all parameters are checked," explains Christian Paul. "In this way, our customers find out at an early stage in which period their investment will pay off."

During live demonstrations, users can directly find out more about the various welding options for their individual component. There are daily demonstrations in the CLOOS competence centre.

In addition, the employees create and optimise robot programs with regard to accessibility, torch and axis position, welding speed, reduction of spatial paths as well as the selection of optimum welding parameters. This also includes offline programming and computer-aided simulation.

The specialists provide advice not only in the CLOOS competence centre in Haiger, but also directly at the customer's site. Among other things, the QINEO tour bus is used here which is equipped with the latest welding power sources. So, users can try the QINEO welding power sources immediately and find out about the individual configuration options and areas of application.

Advance welding research

As a technology driver, CLOOS also supports research projects and research institutions in the field of welding technology. The recently completed StaVari project, for example, deals with additive manufacturing processes for complex products in a variety of highly functional steel constructions. In the StaVari project, CLOOS is responsible for the areas of joining technology and quality assurance for tolerance compensation.

Christian Paul concludes: "With this we want to promote innovative developments in the entire industry and further improve the welding solutions both qualitatively and economically."

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THE CHALLENGES OF LIGHTWEIGHT & THIN SHEET METAL HAVE MET THEIR MATCH.

ALUMINIUM ARC WELDING WITH TPS/i SYSTEM SOLUTIONS.

PMC MIX DRIVE

Modular in design, the capabilities of the Fronius TPS/i can be extended with welding packages to meet the many challenges presented when welding light metals. With PMC (Pulse Multi Control) the built-in penetration stabiliser and arc length stabiliser will provide consistent penetration and faster welding speeds.
When you need to join exceptionally thin materials quickly, with virtually no spatter and consistent quality, you can rely on the low heat input of the CMT (Cold Metal Transfer) process, with which even aluminium-steel joining is possible.

For a demonstration of these or any welding processes, call us on 01908 512300.
Visit: www.fronius.co.uk

The Multilock interchangeable welding torch

Flexible, cost-saving, and resource-conserving, the Multilock System from Fronius is a modular torch system for manual TIG and MIG/MAG welding. All the components can be changed from the torch body through the operating elements, enabling the most varied welding applications all with one torch. As a result, savings can be made on acquisition and storage costs with changeover times reduced.

The welding torch is the ultimate tool of the trade for a welder. Professional welders can expect to have it in hand all day long, frequently with a need for extended arc times and a high degree of robustness. Whereas, delicate TIG welding work demands featherlight, flexible action from the torch. Very different demands are placed on the welding torch, depending on the application and part. At the same time, it must be easy and comfortable to use to suit the personal preferences of the welder.

A welder might typically need to move from welding a fillet weld that is easily accessible to, immediately afterwards, welding an angled part. In the past, the question for the welder would often be whether to accept sometimes awkward handling of the welding torch due to the changed component accessibility or, instead, to change the entire hosepack to get better weld properties. The first approach means loss of valuable time, while the second means a big investment on the part of the business in acquiring a range of torch systems all of which come with extra storage and maintenance costs.

The modular TIG and MIG/MAG welding torches from Fronius provide a solution for varied manual welding challenges and considerably reduce time and effort spent on changing bodies. Torch bodies of varying lengths and angles can now be swapped with ease, so that one welding torch and hosepack form the base for different components such that all welding tasks are covered.

More than 40 different torch bodies are available to choose from for TIG welding and over 80 for MIG/MAG. These also include flexible torch bodies that can be individually bent to shape. The welder simply presses and turns the torch body to release it from the hosepack so absolutely no tools are needed. The new torch body is

then locked in place by inserting and rotating it. The system works with both gas-cooled and water-cooled devices.

The Fronius Multilock System also proves its worth in the event of a fault. If the hosepack is unaffected, but the torch body is damaged, each component can be independently replaced in next to no time using the Multilock connection. Moreover, spare parts are always available from Fronius. Consequently, a modular torch system not only provides greater flexibility, it also enables resource-conserving and sustainable use of the system.

The extremely long service life of the welding torch components also plays a part here. Fronius designs its wearing parts to enable optimal heat dissipation, significantly extending their life. For instance, Fronius uses a high-quality copper alloy for contact tips and the outer tubes for the MIG/MAG torch body are made from stainless steel, while the hose pack components also feature high-quality materials.

When designing the welding torch, the developers at Fronius not only had their sights set on flexibility and ease of repair. Promoting safety for welders was, if anything, an even greater consideration. As a result of their efforts, the modular MIG/MAG welding torch system can now easily be upgraded to function as a fume extraction torch. The FumeEx kit is compatible with all TPS/i-MIG/MAG welding torches from Fronius. It ensures that welding fumes are extracted at the point at which they are generated.

The developers were also focused on enabling easy, comfortable, and ergonomic handling as far as possible. Non-slip, soft components on the handle ensure a secure hold for the new welding torch generation while the ergonomically shaped handle protects the hand musculature from early fatigue. In addition, the ball joint between the torch and the hose pack plus the soft materials used for the hose pack enable effortless, flexible handling.

Welders can also choose between different operating elements depending on personal preference.

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New Jupiter series of modular systems for precision joining

AMADA WELD TECH has announced the availability of the Jupiter series of modular systems for precision joining, available for laser welding, laser marking, resistance welding, micro arc welding and hot bar bonding applications. Jupiter modular systems can be equipped with all joining process modules available from AMADA WELD TECH to provide solutions to customers.

With the Jupiter series, customers purchase an automation platform from a global joining equipment leader and receive development support in AMADA WELD TECH application development centres. Joint early-stage process development in AMADA WELD TECH labs ensures that customers receive the ideal system solution for years of high-quality production. Any welding, soldering, bonding, brazing, laser micromachining and laser marking application can be handled by equipment in the Jupiter series.

The Jupiter modular system platform is a flexible system that comes in four sizes, so it is adaptable to specific production requirements. The stable platform enables

connections of high quality and accuracy. The modular design is configurable to fit all process components and modules. The Jupiter models feature an ergonomic system design with high quality components, designed for 24/7 continuous production. All models are equipped with a Human-Machine Interface (HMI) with touchscreen for easy programming and standard safety features.

Control systems, based upon a Programmable Logic Controller (PLC) or industrial PC, collect all available process parameters and process data into one control system. The data can be stored in local and remote storage areas, all engineered to seamlessly integrate with an Industry 4.0 factory concept.

Optional features for the Jupiter systems include: a Combustion Suppression Unit (CSU) for battery pack welding; a transport system with two individual belts that can be configured for a wide range of product carriers, including transfer systems; an automatic cleaning station for electrodes and thermodes; a "Not OK" bin to separate products outside the control limits from those within control limits and a range of water-cooling options. Also available are upgraded data collection and traceability functionalities, including a barcode reader or a label printer and interfaces for a variety of robotic systems.

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KUKA advanced welding solutions

Rotary Friction Welding (RFW) is a solid-state joining process which works by rotating one workpiece relative to another while under a compressive axial force. The friction between the surfaces produces heat, causing the interface material to plasticise. This process can be used to manufacture several different items intended for use within industrial applications, including piston rods and drill pipes. Jamie Brighton, AWS sales engineer for KUKA UK explains more

Piston rods

Rotary friction welding is a proven method of welding piston rods and hydraulic cylinders. From steel to chrome plated rods, rotary friction welding is suitable for several material bonds. KUKA manufacture friction welding machines that are used all over the world by OEM's to manufacture piston rods such as: Caterpillar, CASE, JCB, Komatsu and John Deere. Our Thompson 5 machine is the most common machine and is used for welding piston rods intended for the construction industry. Our Thompson 3 machine is commonly used for the manufacture of piston rods intended for use in the automotive industry.

Advantages of friction welding piston rods:

Weldable dissimilar materials

Friction welding allows dissimilar materials to be welded with superior strength. In the piston rod industry, materials are changing all the time to suit the application and to reduce weight. Thompson friction welding machines, built by KUKA, are suitable for joining many different material combinations and we are always working to develop more.

Rotary friction welding is a solid-state joining process. This means that the weld is as strong as the parent material and no external materials are added. This is an important advantage to the automotive or construction industries as the weld needs to be as strong as possible due to the stresses and weight endured by the piston rod.

The friction welding process will produce weld flash. All KUKA machines can be equipped with an external automated flash removal system, a post weld process incorporated into the machine cycle.

With the automotive and construction industries ever increasing requirements, it is important to provide a quick process of manufacture. Friction welding is a very fast method of welding piston rods and provides a repeatable process. By working with KUKA, we can provide the suitable parameters to weld the piston rod. This process can be repeated by the customer to prove each weld in a matter of seconds.

As a progressive and evolving industry, the automotive sector has shown that automation is required more and more. KUKA can integrate automation into a friction welding machine to produce a fully automated cell. As KUKA also specialise in automation and robotics, we can design and build an automated cell in house, to suit the customer's specific requirements.

Drill pipes

Drill pipes must withstand the depths and material stresses of oil rig drilling. Friction welding is the proven method of producing welded joints between the drill tool and pipe casings. This method provides a high strength bond and repeatability when manufacturing drill pipes in all material grades. KUKA has manufactured many Thompson friction welding machines used

to weld drill pipes all over the world. Our Thompson 3 machine is suitable to weld drill pipes up to 152.4 mm in diameter. Companies choose friction welding due to the simplistic process and structural integrity of the bond.

Advantages of friction welding in the oil & gas Industry

Rotary friction welding is a solid-state joining process; this means that the weld is as strong as the parent material and no external materials are added. This is an important advantage to the drill pipe industry as the weld needs to be as strong as possible due to the stress on the pipes whilst exposed to underwater and/or corrosive environments.

With so many drill pipes being welded each year, it is important to know that each weld has a 100 percent bond and that every weld is consistently the same. KUKA's engineering experience and extensive knowledge, built up over years of supplying Thompson friction welding machines, means the machine incorporates KUKA's simple to use controls software. Each weld is monitored to ensure a 100 percent weld repeatability.

Rotary friction welding uses a pre-bond method. This is a process which 'cleans' the material at the weld interface before it is welded. Drill pipes are often stored for long periods of time which can allow the parts to rust. By using KUKA's friction welding machines, there is no requirement to remove contaminated material as the pre-bond method removes any contaminants at the weld interface before starting the weld.

The friction welding process will produce weld flash. All KUKA machines can be equipped with an external automated flash removal system, a post weld process incorporated into the machine cycle.

When welding for the drill pipe industry, it may be necessary to remove the internal flash so that the inside of the tube is free from excess material. KUKA can offer an internal flash removal tool known as 'gas lance'. The gas lance provides a high pressure burst of gas to remove all internal excess material. This can also be incorporated into the machine, as part of the machine cycle.

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Newly developed Truncator module for the Ultima-TIG grinders

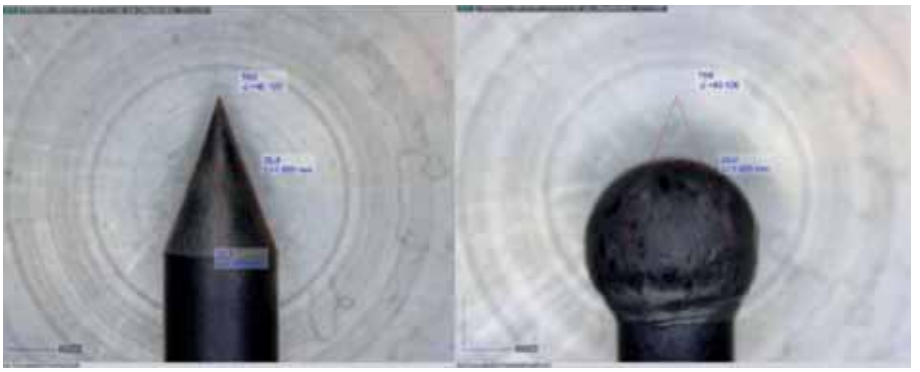
On the Ultima-TIG, you can set the angle to 90° and truncate the tip of the electrode, but if there is a need for multiple grindings with the same settings, greater precision or if the grinder is already mounted with AutoGrind, then the Truncator will simplify and optimise the process.

Not all welders need a truncated electrode, but some welders have that preference since it minimises the risk of the tip melting and dripping into the weld pool. With AC aluminum welding, a truncated tip can help reduce wear on the electrode, ensure a more stable arc and make it possible to weld for a longer time without having to regrind. Various parameters must fit together when TIG welding and the examples in this article demonstrate the impact of the electrode's geometry.

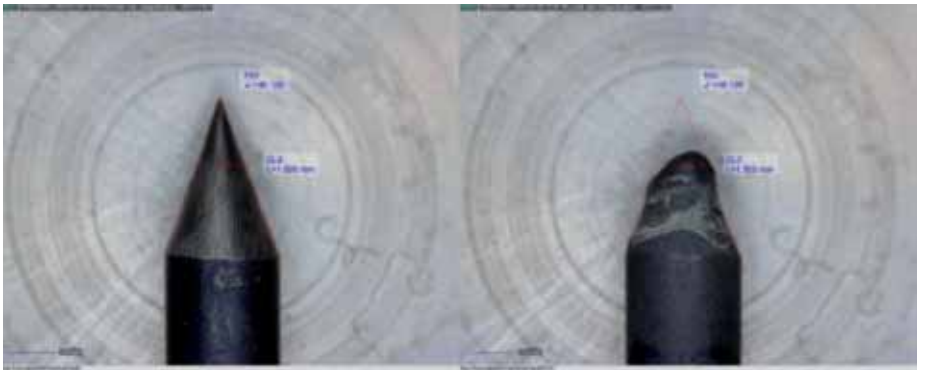
There are two situations, when TIG welding that really stress your tungsten electrode: high amperage welding and AC welding aluminum.

The first situation is stressful on the tungsten electrode, because the arc is creating a lot of heat. Although tungsten has a melting temperature of 3,422°C (=6,192°F), it is just as affected by heat as any other metal, meaning that the smaller the material, the less heat it can carry. A ground electrode cannot carry the same amount of heat at the point as further up the electrode. Therefore, welding at high amperage and creating a lot of heat wears down your tungsten. The worst-case scenario is the point of your tungsten electrode melting off and falling into your weldpool and thereby polluting the weld.

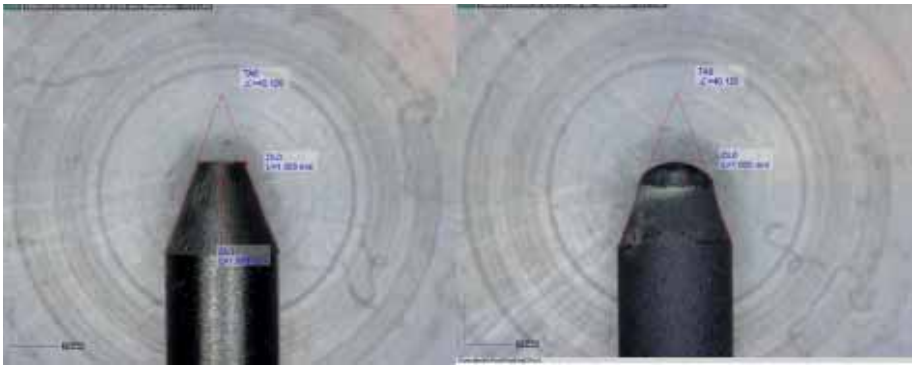
The second situation, welding aluminum, is stressful on the electrode because of the alternating current. When alternating current is applied, the heat is alternately focused on the electrode and the base material. Causing the electrode tip to melt and "ball up". With incorrect settings, ground or not, the electrode will "ball up" tremendously, causing an unstable and wandering arc, a wide weldpool and a poor quality weld.



A ground electrode before welding (left) and after AC welding (right) with incorrect settings on the welding machine. Diameter Ø 2,4 mm , grinding angle 20° = tip angle 40°



A ground electrode before welding (left) and after AC welding (right) with correct settings on the welding machine. Diameter Ø 2,4 mm , grinding angle 20° = tip angle 40°



A ground and truncated electrode before welding (left) and after AC welding (right) with correct settings on the welding machine. Diameter Ø 2,4 mm , grinding angle 20° = tip angle 40°

However, with the correct settings, frequency, AC-T and AC-I balance and electrode preheat, you can somewhat maintain the point of your ground electrode. If the electrode is too pointy, the tip will melt off, because of the heat applied on the electrode. In this case, your tip might fall into your weldpool and pollute the weld.

In both situations you can diminish the risk of melting of the tip by truncating your tungsten electrode. Research has shown that truncating the tip prevents the tip from melting off, preserves the tip and a stable arc and extends the amount of time between regrinds.

Truncate the tip of the electrode if welding with high current or with AC welding as it provides better welding quality, more stable arc and less wear on the electrode.

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