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Up to 70 percent less rework with addition of Pulse

Fronius has expanded its TransSteel series to include the addition of the pulse function. Not only does the pulsed arc allow faster welding speeds on thicker materials, but rework is reduced as the pulsed arc causes less welding spatter.

The pulse mode makes it possible to bypass the intermediate arc, which is difficult to control and prone to spatter. The resulting reduction in spattering leads to up to 70 percent less rework. Furthermore, the pulsed arc allows welding speeds that are up to 30 percent higher to be achieved.

These power sources are true all-rounders as a wide range of functions supports the welder in various applications. With the help of the spot function, even and consistent welding spots can be produced; ideal for tacking. Interval welding produces a rippled seam appearance and also reduces the possibility of material distortion on light gage sheets.

Special characteristics ensure the user has the ideal arc properties at their disposal. "Steel Root" for root welding provides a soft and stable dip transfer arc for good gap-bridging ability over wide gaps. The "Steel Dynamic" welding program, on the other hand, produces a particularly hard and concentrated arc, thus achieving high welding speeds and deep penetration. Where minimal spattering and deep penetration are the order of the day, the TransSteel Pulse models with "Pulse Controlled Spray Arc" provide the perfect settings. With the "SynchroPulse", the welding power alternates between two operating points at a frequency of up to 5 Hz. As the change between high and low current facilitates welding in a vertical up position, for example, it is possible to produce a pronounced seam rippling on aluminium alloys.

The TransSteel is very easy to use, parameters can be easily set and a USB stick connection for all welding documentation completes the device concept.

Fronius has added the pulse function to three models. The TransSteel 3000 compact is a multiprocess device ideal on the construction site, in the workshop, or for repair work. For recurring welding tasks or in small series production, the pulse function on the TransSteel 4000 and TransSteel 5000 brings more options and speed.

Read how Guntamatic has incorporated the Fronius TransSteel 4000 Pulse into its production operation on pages 54-55.

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EMO MILANO proves its value

EMO MILANO 2021, the world trade show dedicated to the metalworking sector, was a huge success. Over 60,000 visitors attended the exhibition, held in Italy, from over 91 countries around the world.

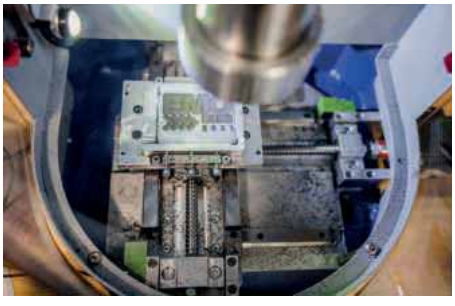
The event was promoted by CECIMO, the European Association of Machine Tool Industries and organised by the operational structures of UCIMU-SISTEMI PER PRODURRE, the Italian machine tools, robots and automation systems Manufacturers' Association.

Luigi Galdabini, general commissioner of EMO MILANO 2021, says: "The exhibition data confirms the value of the event, considered as the appointment of reference for the worldwide manufacturing industry of machine tools, robots and automation systems.

"In such a complicated, historic moment, where the public health emergency is not yet completely over, EMO showed its importance, drawing visitors to Milan, who could have the green light to move from their countries of origin. Moreover, the participation of the operators, coming not only from Europe, also proves the attractiveness of Italy, regarded as one of the most interesting and promising markets, as well as a leading manufacturing country in the sector."

Alfredo Mariotti, director of the exhibition, adds: "A very large number of exhibitors have expressed their full satisfaction with the results achieved over these six exhibition days. The work carried out by the EMO team has been appreciated by Italian and foreign operators, who also expressed their satisfaction on social media. This supports the climate of trust that characterises the sector and regards EMO MILANO 2021 as the launch event for the post-pandemic era."

Despite the mobility restrictions still in force, EMO MILANO confirmed its international character even on this



occasion. Foreign exhibitors accounted for 60 percent of the total, whereas foreign visitors made up 30 percent of the overall number.

Germany, Switzerland, France, Spain, Austria, Slovenia, Turkey, Poland, Russia and Denmark were the most represented countries at the trade show, which was also attended by numerous operators from Finland, Croatia, Estonia, Lithuania, Hungary, Czech Republic, USA, Great Britain, Israel, Japan, South Korea, Ireland and Egypt.

Besides registering the users' interest, EMO MILANO 2021 attracted the attention of the international press with about 400 accredited journalists, of whom 40 percent were from abroad.

Students also confirmed their interest for the event. 1,300 young visitors, including students from technical high schools, Universities and ITS-Higher technical schools, visited the exhibition accompanied by their teachers. Among them, 450 were escorted on guided tours by tutors of UCIMU-SISTEMI PER PRODURRE.

Beside the technology offering, the exhibition featured numerous side initiatives, such as EMO Digital, the exhibition area focused on digital technologies; EMO Additive Manufacturing, dedicated to one of the most promising fields of the manufacturing production; EMO Start-Up, which offered an overview of new enterprises working on the development of products and projects related to the world of production systems and metalworking.

Another key feature of the show was the speakers corner, an arena in Hall 5, which included over 80 speeches and in-depth analyses and discussions by exhibitors and organisers. In addition, 20 meetings were hosted within the EMO additive area, arranged by the AITA-Italian Association of additive technologies. Over 2,000 attendees registered for the meetings, in addition to about 3,000 remotely connected users, for an average of 500 users per day, who, over the six exhibition days, were able to follow the events held at the trade show thanks to the live streaming service.

Interest in the exhibition is highlighted also by the consultation statistics of the exhibition website. Over 800,000 views were recorded on **www.emo-milano.com**: from Italy, Germany and Switzerland, followed by the USA, France, Spain and Japan.

These figures are added to the 600,000 views registered on the Smart Catalog, the official catalogue of the exhibition, viewed mainly by mobile phones.

The next edition of EMO MILANO will take place in October 2027.

EMO MILANO
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Sheffield Demonstration and Training Centre open for business

XYZ Machine Tools, in partnership with CERATIZIT UK & Ireland, has opened the doors to its latest Demonstration and Training Centre. Located on the Advanced Manufacturing Park, the centre is strategically placed to support customers looking for the latest in machine tool technology from XYZ Machine Tools.

The facility is equipped with a broad range of XYZ machines from ProtoTRAK controlled lathes and mills, through its heavy-duty and linear rail machining and turning centres to the flagship UMC-5X 5-axis machining centre.

Working with CERATIZIT UK & Ireland, XYZ Machine Tools customers can visit the centre to investigate not only the machines, but also to develop machining strategies to help improve manufacturing efficiencies. It will also be utilised to provide training for those customers in the region who have purchased new machine tools, where they can make use of the classroom facilities alongside hands-on practical use of the machines.

The Technical Centre is ideally placed to provide support to manufacturing companies both locally and nationally. With the full range of CERATIZIT products available for use on a wide range of machine tools, the aim is to support customers with both training and process development

On the opening day visitors from across the manufacturing sector descended on the centre to witness live demonstrations. "The turnout exceeded our expectations and is a sign that manufacturing is returning to some form of normality and customers are continuing to look to invest in new machine tools to meet changing and growing demands on their manufacturing capacity," says Nigel Atherton, managing director of XYZ Machine Tools.

Tony Pennington, managing director of CERATIZIT UK & Ireland says: "This new Technical Centre is an extension of our previous facility, but by locating it on the Advanced Manufacturing Park we have been able to expand the services that we can provide to customers with a dedicated team helping to support the development of machining processes. We are really excited about working with our machine tool partners to create what will be a focus of manufacturing technology, providing practical solutions to machining issues. The reactions of visitors on the opening day are proof that we are delivering a service that will become increasingly valuable in enhancing their productivity."

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Ledwell Plastics takes die-sink EDM to the next level

To enhance the manufacture of technically challenging moulds from hardened stainless steel, Ledwell Plastics has invested in a new Sodick AD35L spark erosion machine from Sodi-Tech EDM. This advanced die-sink EDM machine provides the speed and accuracy required to reduce costs and enhance precision, while also offering low electrode wear and the necessary reliability to facilitate umanned overnight operations.

Ledwell Plastics is an injection moulding and toolmaking specialist that serves many different industries, including agriculture, food packaging and electric vehicles. Founded in 1969 by Paul Simms, father of current managing director Benn Simms, Ledwell can mould parts weighing from 1 g up to 1.5 kg, while the largest moulding produced to date measures 900 mm long x 450 mm wide x 90 mm deep. Operating around the clock from two factories in Leicester, negotiations are currently in progress regarding a third premises for this progressive 36-employee business.

"Our toolroom makes moulds from many different materials, everything from aluminium through to hardened stainless steel," explains Benn Simms. "Recently, however, we were working almost exclusively with the latter material in the production of very small and intricate moulds, a trend that looked set to continue for some time. Our problem was our existing die-sink EDM capability, which was somewhat antiquated, meaning we had issues with accuracy and breakdowns that were impacting project timescales and costing a lot in repairs."

As a result, Ledwell Plastics sought a new die-sink EDM that could work to tolerances of less than 0.001 inch, 0.025 mm. In addition, the highly technical, hardened stainless steel moulds require a large amount of sparking, so fast processing speed was another factor high on the wish list.

"The Sodick AD35L fitted the bill nicely, especially as it was also the perfect size," states Benn Simms. "We looked at other spark eroders, but after undertaking some research and speaking to other Sodick users, we settled on the AD35L. During an on-site demonstration at Sodi-Tech EDM,

we could see that the machine's performance was particularly impressive with its high-speed linear motors."

Benn Simms cites the 10-year warranty on positioning accuracy, excellent surface finish and low amount of electrode wear as further factors supporting the purchase of Ledwell's first Sodick machine: "The AD35L was installed at the end of January 2021, with Sodi-Tech EDM delivering a full training programme here at Leicester. Sodi-Tech were also great at providing advice on things like optimum electrode selection."

Along with the hardened stainless-steel moulds, the ISO9001-accredited company uses its new AD35L for jobs involving materials such as aluminium, steel and hardened tool steel. As Ledwell works extensively on the design and development of moulded parts for its customers, often involving patent applications , Non-Disclosure Agreements (NDAs) are in place for almost all projects. Although the company can say little about the moulds it machines, the benefits offered by the Sodick AD35L are clear to see.

"Our new Sodick allows us to run overnight, unlike our previous machine, which we could never trust in that regard, particularly with blind components/features that are difficult to flush," says Ben Simms.

"The high-speed linear technology of the AD35L evacuates the cavities much better with its enhanced flow of dielectric fluid."

Notably, investment in the new machine has boosted the production of sliding cores for the company's range of injection moulding machines, which extend in capacity from 60 to 440 ton capacity. Previously, the company would cut entire sliders, 6 impressions per slider set, with a single large copper electrode. But this process was time consuming and expensive regarding the amount of copper required.

"With the AD35L we spark just three cavities at a time, before indexing the slider over," explains Ben Simms. "However, we double up on the amount of sliders we spark; loading two at once for machining with a single electrode. As the cycle time is quicker and electrode wear is low, we're manufacturing fewer electrodes and buying less copper. In addition, accuracy and repeatability are better."

As part of its structure, the Sodick AD35L features optimised rib arrangements which increase rigidity by approximately 70 percent to support enhanced workpiece precision.

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ETG's offering soars with Eagle G5 Precision EDM

Taking EDM machining to a completely new level, the Engineering Technology Group (ETG) has now introduced a new addition to the Gantry Eagle series of die sink EDM machines with the arrival of the Eagle G5 Precision from OPS Ingersoll. Now available in the UK from ETG, Ingersoll has taken the gantry design concept of its Gantry Eagle 500 platform and upgraded it with the introduction of the G5 Precision

With the new Eagle G5 Precision, OPS Ingersoll has built upon the workshop suitability of the Gantry Eagle 500 and combined it with precision components to introduce a machine that delivers astounding precision and electrode usage even in graphite to VDI 8.

In developing the new Eagle G5, the aim was to create a machine to deliver the very highest in repeatable accuracy. Driven by the fact that accuracy requirements have almost doubled in the tool and mould making industry, the challenges in terms of automation, material, wall thickness and precision will certainly fall into sharper focus in the future and the Eagle G5 now provides precise multi-cavity machining that was not available in this class of machine until now for those mould makers chasing the microns.

The Eagle G5 Precision has a 750 by 650 mm table with work tank dimensions of 770 by 670 by 440 mm (W/D/H) and a dielectric level height of 450 mm. Within this envelope, the new machine offers 525 by 400 by 450 mm of travel in X, Y and Z axes with a distance from the head to the table ranging from 135 to 585 mm. No other machine can offer this 'Useable Volume' within these movements allowing small and larger workpieces to be machined from one reference. Capable of workpiece loads of 1,000 kg, the new machine provides sufficient space and capacity for all your EDM processing requirements.

The G5 Precision incorporates many new temperature stability features, including the implementation of a full cabin around the working area as well as a new vacuum

system for fume extraction. The machine is equipped with the new Eagle Powerspark One control system and part of this control is the programming software Eagle Powerspark Editor (PSE). With this, OPS Ingersoll redefines user-friendliness with complex eroding tasks now created and adapted with ease.

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New machine shop means business

Erodatools gets its fledgling machine shop up and running by investing in three new, high-performance Doosan machines from Mills CNC

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, has recently supplied leading EDM precision subcontract specialist Erodatools Ltd. with three new Doosan machine tools.

The machines, comprising of two compact, multi-tasking Lynx lathes, a Lynx 2100LSYB and a Lynx 2600Y and a DNM 6700 vertical machining centre, supplied with a Nikken 4th-axis unit, were installed at the company's 8,500 sq. ft. facility in Penistone, South Yorkshire in September 2020, April 2021 and May 2021 respectively.

The investment in three machines, made in such a relatively short space of time and during the pandemic, reflects a major strategic move by the company to augment its core and traditional wire and solid sink EDM operations through the rapid creation of a fully-functional, high-performance in-house CNC machine shop with state-of-the-art turning and milling capabilities.

Spearheading the development of the new resource is Jon Harper, Erodatools' recently appointed machine shop manager. He says: "The new machine shop complements the EDM side of the business. It is run on the same business principles and company values that have served Erodatools so well for almost 50 years, namely a commitment to continuous improvement, to 'best-in-class' quality and to unrivalled customer care."

Erodatools was created in 1972 by brothers Ken and Tony Rolfe as an EDM precision subcontract specialist company providing high-accuracy wire and die-sinking machining services to locally-based customers operating in the mining and rail industries to name but a few.

Back in those days, EDM was a relatively unknown machining process amongst many manufacturers with some, more familiar with conventional machining technologies, often referring to it as a 'black art'.

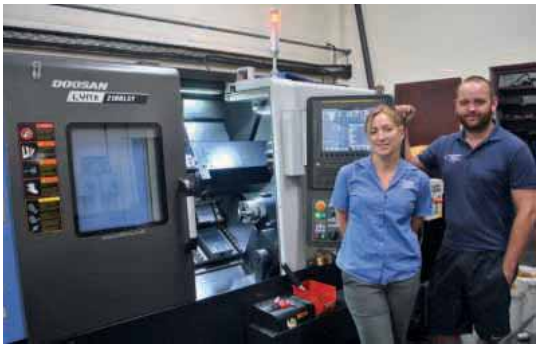
However, for the stress-free machining of high precision and often, complex and intricate, workpiece features such as thin walls, tapers, internal corners with tight radii to exacting geometric tolerances and surface finishes, the process was and still is largely unrivalled.

Jon Harper continues: "Erodatools, through the skill and dedication of its people combined with regular and prudent investment in advanced EDM machine tools, built a strong and solid reputation in the market based on quality, lead time fulfilment and cost competitiveness.

"As EDM became a more mainstream technology so Erodatools, as a recognised and leading niche specialist, was able to take advantage of the situation and grow the business."

Today the company serves a diverse range of customers operating in the aerospace, automotive, oil and gas, medical devices, marine and energy sectors.

It was always Erodatools' intention to augment its EDM operations by creating a CNC machine shop. The issue was more 'when' as opposed to 'if'. Caroline Healey, Erodatools' works manager explains: "Although EDM is our core business and, we have a large number of loyal customers, we are essentially a 'jobbing' shop. As EDM is often at the end of the process chain, it is often difficult to predict work volumes in advance. To add more certainty to the business and to strengthen our position within customers' supply chains, we wanted to create an in-house CNC machine shop. The outbreak of the pandemic and the uncertainty this created, made this need more acute."



The first Doosan acquired by Erodatools was a Lynx 2100LSYB which was installed in September 2020. The 8" chuck FANUC controlled compact lathe is equipped with a 15 kW/4,500 rpm main spindle, a 5" chuck 6,000 rpm sub-spindle, a 24 position 12 station turret, 6,000 rpm driven tooling capability and a +/-52.5 mm Y-axis stroke.

Since installation, the machine has been put through its paces machining a range of components made from an equally diverse range of materials including steel, stainless, aluminium, aluminium bronze alloys, monel and inconel.

Subsequent Doosan machine tool investments occurred in April and May 2021 respectively with the arrival of a new DNM 6700 vertical machining centre and a new Lynx 2600Y lathe, which, incidentally, was one of the first to be installed in the UK.

Although still early days, all indications are that Erodatools' CNC machine shop is a roaring success.

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Machine efficiencies achieved in wire cutting EDM

ADM Precision Tools is a UK manufacturer and supplier of precision tooling components, based in Whitefield, Manchester. Started by Jim Kelly in 1986, the company understands the importance of going above and beyond a 'standard' service when designing and producing plastic mould tooling.

It produces and tests rapid physical prototypes while constantly investing in the latest technologies, research, testing and manufacturing methods.

As part of its efforts to continually improve the effectiveness of its processes, ADM Precision Tools, in conjunction with Eclipse Magnetics and Sodi-tech EDM Ltd., were keen to trial methods to improve the efficiency of its Sodick AQ600L wire erosion machine by improving cycle times and reducing downtime.

With the assistance of Sodi-Tech, as part of its R&D programmes in conjunction with Eclipse Magnetics, ADM Precision Tools trialled the MM20 Micromag magnetic filter from Eclipse's filtration range to explore the benefits that the filter can bring to EDM machining and the dielectric fluid.

The Micromag can filter ferrous materials from cutting fluid, including dielectric, removing ferrous particles including extremely fine particle matter. Because of fine-particle removal, fluids are much cleaner which, in turn, produces less secondary sparking making the process much more efficient with a significant decrease in energy wastage.

An additional benefit found due to the cleaner fluids was that there were much fewer wire breakages, making the process much more robust. As a result of the decrease in wire breakage, combined with the reduction in secondary sparking, ADM has seen a significant increase in the cutting speed of the machine, with the trial application showing improved results by between 17 percent and 30 percent.

Tom Cooney, manufacturing engineer at ADM Precision, says: "We fitted the Micromag MM20 2 months ago and since then have seen a vast improvement in our efficiencies. We have seen an increase in our machine cutting speeds of between 17 percent and up to 30 percent, with substantially less wire breakages."

"It takes a couple of minutes to take the magnet out, clean it into a swarf bin and then reassemble, so it's easy and there aren't any consumable parts to replace. All-in-all, it proves that the Micromag units have given us a great improvement and I'm sure would be a great investment for any EDM machining process."

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New EDM solutions showcased at EMO Milano

At EMO Milano 2021, GF Machining Solutions highlighted EDM technologies designed to help manufacturers increase productivity and accuracy. These die-sinking and wire-cutting EDM machines, along with robust solutions that target the mould and die industry, provide operating precision, superb part quality and automated options.

The show marked the unveiling of the new AgieCharmilles CUT P Pro series of wire-cutting EDM machines designed for increased productivity and ideal for every application with the largest technology database. The series includes the CUT P 350 Pro, the 550 Pro and the 800 Pro with robust designs and intuitive HMI as well as several automation options for lights-out operation.

GF Machining Solutions also announced the AgieCharmilles CUT X series of wire-cutting EDM machines, featuring new technologies that significantly increase operating precision. They are capable of holding extreme pitch positioning and contouring capabilities for superb part quality. The series includes the CUT X 350 and the CUT X 500 machines.

Particularly for mould makers in microelectronics, telecommunications, medical technology, connectors and optical systems, GF Machining Solutions demonstrated its AgieCharmilles FORM X 600 die-sinking EDM at EMO. The machine delivers positioning accuracy within 1 µm, and general machining accuracy on the workpiece down to 5 µm, combining speed and precision.

The new Uniqua Human/Machine Interface (HMI), available for the CUT P Pro and the CUT X series, capitalises on more than a century of EDM technology, with optimal functionality and ergonomics in a 19" vertical touchscreen, full keyboard and mouse.

It is designed for every skill level, every approach and every user. For the utmost compatibility, Uniqua supports legacy file types from various EDM manufacturers. It also creates, imports, modifies and executes sequential, ISO-based and object-oriented programs from previous versions of VISION and AC CUT. With offline and at-the-machine programming, ISO-based

functionality and object-oriented programming, Uniqua provides a powerful graphic tool with integrated CAM and also ensures compatibility with major CADCAM programs.

With Intelligent Power Generator (IPG) technology, CUT P Pro series machines deliver surface finishes as smooth as Ra 0.08 µm and heighten accuracy with integrated thermal regulation that allow to achieve an accuracy of ±2 µm.

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Machining progression with XYZ pays dividends

The recent installation of what is Holt Broadcast Services' third machine, a XYZ 500 LR vertical machining centre from XYZ Machine Tools, is already paying dividends, with improved cycle times, reduced post-machining operations and greater versatility.

Founded in 1994, Holt Broadcast Services is a specialist manufacturer of sheet metal enclosures, whether they are standard 19" rack mounting enclosures common in the broadcast industry or custom designed solutions. Its customers range from broadcast services through the electronics and aerospace sectors. While much of its production can be generated using conventional sheet metal forming equipment and skills, there is also a requirement from machining. This is generated through the extensive use of extruded material and the individual requirements of customers, where the design and manufacture of specialist tooling, such as punches, makes machining much more cost-effective and efficient.

Holt Broadcast Services initially purchased a 2-axis ProtoTRAK mill from XYZ Machine Tools for this work, then progressed to a 3-axis ProtoTRAK bed mill for greater efficiency. The latest development is the arrival of a XYZ 500LR vertical machining centre that has again transformed how this work is undertaken. "Typical of this work are vent panels, which can have up to 400 holes in them," says Jon Sturgess, workshop manager. "We normally produce these in batches of 100 off and by utilising the toolchange and 12,000 revs/min spindle off the XYZ 500LR, we are cutting cycle time per panel by up to 30 minutes, a significant saving."

Further benefits of machining these parts compared to punching include the elimination of secondary operations. Punching caused distortion that required correction as well as burring on both sides. With machining, distortion is eliminated and deburring is reduced to just one side as holes are deburred as part of the machining process and included in the cycle time saving.

The switch from the XYZ ProtoTrak control to the Siemens 828D Control was also straightforward, with setter/operator Chris Trinder quickly getting up to speed with the Shopmill conversational programming following the training provided by XYZ Machine Tools: "We certainly have no regrets in the switch to the XYZ 500LR. We are slowly building up the number of jobs we do on it and when these repeat it is a simple task to just set the X-Y-Z datum and away we go, this and the addition of the carousel toolchange and increased spindle speed is where we will see the greatest benefits as we move forward," says Jon Sturgess.

Machines flow both ways at XYZ Machine Tools

With sales continuing to grow for XYZ Machine Tools, the factory at Burlescombe, Devon has been a hive of activity with machines being loaded and shipped ready for delivery to customers and new stock arriving at an increasing rate.

During September and October, it is estimated that 100 machines were to be shipped out to customers in the UK and across mainland Europe. As expected, given XYZ Machine Tools' reputation for keeping high levels of machines in stock, these will be more than replaced, with 87 machines arriving by mid-September and a further 116 will delivered to the factory by the end of October.

"As the UK manufacturing sector continues to bounce back from the previous 18 months of uncertainty, we are seeing significant demand for machines and a need for those machines to be delivered quickly," says Nigel Atherton, XYZ managing director. "This demand fits perfectly with XYZ Machine Tools operation as we have always maintained high levels of stock, at times having over 300 machines available for delivery in days, rather than months. While the rapid increase in orders impacted on stock levels, we have managed the situation and customers can be assured of our usual first-class response to their needs."

While the pressure is on to deliver machines in record times, XYZ Machine Tools is maintaining its quality procedures that includes extensive pre-delivery checks to ensure all elements of the machine are functioning correctly, with every machine undergoing the latest Renishaw ball bar and laser testing equipment prior to being signed off for delivery.

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GM CNC expands network in Scotland

To further enhance its presence in Scotland, GM CNC has now appointed the services of CNC Services (Scotland) Ltd. With GM's growing customer base in Scotland, CNC Services Scotland has partnered with GM to provide sales, service and maintenance support of the leading Victor brand of machine tools as well as customer support and services for the used machine division of the company.

With more than 35 years of industry experience, Lee Mezzetti started his career as a multi-disciplined engineering apprentice at British Steel and he has spent the last 15 years as a director of CNC Services Scotland; a company working with a prominent machine tool supplier in the region providing both a machine tool sales, maintenance and engineering support service.

Lee Mezzetti says: "I have an extensive range of customers and industry contacts in Scotland and I look forward to having the opportunity to offer these businesses the most robust and capable machines in the industry. Scotland is renowned for its oil & gas and offshore industries that place heavy demands on machine tools. Having an extremely diverse range of machines that are built for longevity with in-stock availability to offer these companies high performance and rigidity will be the perfect solution for manufacturers north of the border. Furthermore, GM is a leader in used machine tools and the facility to provide manufacturers with the best prices and service for their used machines in part exchange for new Victor machines will certainly aid companies in getting the best possible solution for their requirements."

GM CNC director, Nicola Howard adds: "We are delighted to commence a working relationship with such a reputable and established company as CNC Services (Scotland). Having the expertise to provide manufacturers with service, maintenance and complete support of Victor machines will further bolster our commitment and already outstanding reputation for impeccable service for our customers in Scotland.

"Furthermore, the expertise and

knowledge that CNC Services (Scotland) has of the local manufacturing sector is something that will enhance the position of GM. It will help us to introduce the leading Victor brand and demonstrate the merits of the build quality and rigidity that have made Victor a mainstay for machine shops adhering to the most challenging of machining conditions and environments."

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Guide bush-less operation and chip breaking software transform turning of aluminium

"We believe that investment in the very latest technology is the key to quality, reliability and competitiveness," says Dave Zollo, joint owner of contract machinists IML (UK). He and Jerry Way started the business in 1995 and moved into the current, 14,000 sq ft premises in Weymouth in 2011. One year later the first sliding-head lathe arrived, a Citizen Cincom A32-VII with 32 mm bar capacity, followed in 2013 by a 16 mm bar model, a Cincom C16-VI.

The early investments were triggered by an increase in contracts from the medical industry and a desire to be able to manufacture components in one hit, such as endoscope cleaning equipment parts. To cope with an ever-increasing level of work, including for the high-end automotive sector which has grown over the past couple of years to become more than 50 percent of turnover, there are now four different models of sliding-head lathe on site from the same supplier.

The latest two, designated L20-XLFV and L32-XLFV, were installed in 2018 and 2020. Unlike the first two Cincoms, they offer the flexibility to allow removal of the guide bush, as well as having the notable benefit of Low Frequency Vibration (LFV) software built into the operating system of the control. Dave Zollo noted that the more modern machines are also more user-friendly, allow better access and are quicker and easier to set.

He explains: "These advanced, twin-spindle, sliding-head lathes are helping to keep us competitive on the world stage, as is automation throughout the factory.

"All of our lathes including four fixed-head models are bar-fed and work 24/7, with the sliders able to accommodate a wide range of batch sizes from typically 50- to 30,000-off. Dimensional tolerances of less than ± 10 microns may be easily held.

"Even smaller quantities are economical to produce, partly because we have adopted a policy of standardising on one size of stock on each of the Cincoms, so we do not have to waste time changing over bar sets.

"We have also invested in automation on the milling side of our business, which accounts for more than half of turnover. Our four vertical machining centres are equipped with robotic loading and remote monitoring, while two horizontal machining centres on the shop floor have a twin automatic pallet changer to minimise idle times.

"It all helps to keep costs down and allows us to quote our customers prices that are very similar to those we were charging two decades ago."

Aluminium bar, which accounts for a significant proportion of throughput of turn-milled parts, is the villain of the piece as regards sliding-head turning in the Weymouth factory. The material is often of variable quality in terms of straightness and diameter variation, so can jam in the guide bush of sliders and requires frequent supervision by the operator to adjust the collet.

The ability to remove the guide bush on the L20 and L32 in less than half an hour allows the subcontractor to turn aluminium bar into shorter components in fixed-head mode without problems. It also has the

advantage of reducing the remnant length from typically 275 mm to 100 mm. Completion of one recent IML (UK) contract consumed 300 bars, so it is clear that a lot of material and money can be saved.

When turning difficult to chip materials, Citizen's LFV software, which is part of the control's operating system, breaks swarf into manageable chip sizes, whereas normally it would be stringy and entangle itself around the tool and component. This capability to manage the size of swarf is in addition to any chip breaking features that may be ground into an indexable insert.

Dave Zollo singles out aluminium as well as stainless steel bar to be particularly problematic in terms of bird's nesting. To alleviate it, the LFV function can be switched on and off via G-codes in the part program, enabling optimal use of the feature during different parts of a cycle. It is, however, not a pecking macro in the CNC program itself.

As one operator looks after the four sliding-head lathes, LFV is helpful in minimising periodic attendance at the machines to disentangle clogged swarf. It is notable that the 8-axis L32 has LFV on both the main and counter spindles, allowing the oscillations that produce the chip breaking action to assist in the production of both front- and reverse-end turned, milled and drilled features.

LFV oscillation lifts the tool tip clear of the component surface by tens of microns for ultra-brief periods to allow coolant to penetrate the cut more efficiently. It reduces heat and prolongs cutter life, while at the same time enabling depth of cut to be increased, even when processing tough materials. It often eliminates the need for a roughing pass and significantly shortens cycle times. Dave Zollo advised that it is of major benefit during attended day and night shifts and especially so during the weekend when staff are not present.

He concludes: "Swarf build-up is really the only thing that stops modern bar-fed CNC lathes, which are inherently very reliable. LFV on the Citizen sliders virtually eliminates the hassle of clearing away swarf and consequent loss of production, especially during minimally attended operation.

"Even when we are running them unattended at the weekend, it is unusual for them to stop before the bar runs out. Should there be a problem, however, the on-board cameras allow us to monitor production and come into the factory if necessary to take remedial action."

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Stainless steel shotgun is R&D start-up's first project

Clay shooting is a popular global activity as well as being one of the 42 Olympic disciplines and, as in any sport, the quality of the equipment is paramount. One enthusiast who is determined to manufacture a range of affordable yet high-quality shotguns to bring them within the financial reach of a wider market is Christopher Iaciofano, who set up RIMD in Fleet Marsden, near Aylesbury in January 2021.

To produce the metal parts for the guns, he has installed a Hurco 5-axis CNC machining centre and a Dean Smith and Grace (DSG) 6.5-tonne manual lathe specially adapted in-house to enable highly accurate deep hole drilling of barrels. The first gun will be marketed as the 'Chiltern' later this year through an established manufacturer of traditional hand-crafted shotguns.

The rationale for establishing the venture was Christopher Iaciofano's identification of a gap in the engineering marketplace for a company capable of undertaking the functions needed to launch a new product: Research, Innovation, Manufacturing and Development (RIMD). The company is able to remove some or all of these elements from a customer's activities and inject a high level of expertise to achieve a superior end product and accelerate time to market. There is a special focus on R&D, which is generally the first area to be neglected in favour of day-to-day activities.

Having gained a BSc in mechanical engineering at Bournemouth University, Christopher Iaciofano subsequently worked in the oil and gas sector. He was responsible for designing and manufacturing chemical injection equipment capable of withstanding pressures up to 3,000 bar utilising a diverse range of exotic materials, which he became expert in machining.

With that knowledge and having an antipathy towards the mild steel parts on his own shotgun rusting, he decided to design and construct a new version from a special blend of PH17-4 hardened stainless steel. It is particularly difficult to machine, as it is a sticky material requiring very sharp cutters yet has a hardness of 38 HRc and above, which tends to wear them quickly. To make matters worse, small drills are involved in the production as well as milling cutters down to 0.6 mm in diameter.

Hurco offers two main styles of integrated 5-axis Vertical Machining Centre (VMC), one with a swivelling trunnion supporting a rotary table and the other with a B-axis spindle and a horizontal rotary table. Neither design was suitable for RIMD, as it would have been impossible to mill the outside of the one-piece shotgun barrel from a 76 mm diameter, 900 mm long billet without buying an excessively large machine.

The answer was to purchase a Hurco VMX42HSi 3-axis VMC equipped with a

Kitagawa 2-axis compound rotary table positioned at the far right hand side of the machining area. The latter enables the 900 mm barrel billet, which has already had the two bores roughed and finished on the DSG, to be fixtured by picking up on the bores and rotated. The entire outside can then be milled along its length using the VMC's one-metre X-axis. In the process, the barrel is reduced to about 1.2 mm wall thickness and 1.4 kg, just five percent of the original billet weight of 28 kg.

The machine is equipped with an 18,000 rpm spindle, so very high surface finish is achieved. Linear scales provide ultra-precise feedback of the orthogonal axis positions to the control. The table additionally feeds its rotary positions back to the proprietary Hurco WinMax CNC, which is capable of controlling all five axis motions simultaneously. Many such programs are employed in the production of components for the Chiltern gun, all of which come off the Hurco in one operation to within 5 µms dimensional accuracy on all critical features.

Most of the remaining cycles are 3+2, with the rotary axes positioned and clamped to present the part to the spindle in convenient orientations to maximise machining efficiency. All programming is carried out using either SolidCAM or GibbsCAM rather than directly at the WinMax control, although the latter conversational software remains a convenient option for future projects.

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Precision subcontractor prepares for post-COVID proactivity with heavy-duty CNC machining investment

A Scottish precision engineering firm has invested in a state-of-the-art heavy-duty CNC turning centre as it looks to proactively respond to the challenges posed by COVID-19. Stonehaven-based Kincardine Manufacturing Services (KMS), which specialises in the manufacture of complex components used across the oil and gas sector, has taken delivery of a Yamazaki Mazak SLANT TURN 550M CNC turning centre as part of its long-term, post-COVID business resilience strategy.

The SLANT TURN 550M is ideally suited to the cutting of large, long shaft workpieces up to 5,690 mm in length and Ø910 mm. Linear roller guides on the X- and Z-axes provide a high level of rigidity during the cutting process, while the machine tool is able to process a broad range of difficult-to-machine materials thanks to its high-power 45 kW 1,000 rpm main spindle.

The investment is the latest in a series of machine tools KMS has purchased from Yamazaki Mazak, including models from its QUICK TURN and INTEGREX series.

Graham Truscott, financial director & founder at KMS, comments: "The COVID-19 pandemic has hit manufacturing hard, with the energy sector in particular having faced a wealth of cancelled or postponed projects. However, at KMS Engineering we are well aware of the importance of investing in our resilience in order to adapt to the manufacturing challenges of a post-COVID world. In short, we must prepare for economic recovery by being proactive.

"While many took the decision to cut costs or reduce capacity during the COVID-enforced lockdowns, we decided to increase our manufacturing capacity by investing in premium CNC machine tools. We have worked with Yamazaki Mazak for a number of years and have enjoyed great success with our QUICK TURN and INTEGREX models. The SLANT TURN 550M will add a new dimension to our precision machining capabilities, particularly when undertaking heavy-duty cutting of difficult-to-machine materials, at high feed rates."

He concludes: "The priority for us has always been our commitment to our customers, and the investment in new machinery will help us improve our machining capability. We also look forward to the SLANT TURN 550M's positive effect on our overall capacity and response times, ensuring we are ready for the anticipated increase in production demand throughout 2021 and beyond."

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Not your average gun drilling or boring machine shop

by Andrea Wilson, director of Hone-All Precision

You may think that they all say that and they probably do.
Therefore, it's worth taking two or three minutes to understand our justification for claiming that you will not find better or at least understand our approach and the way we do business. It's the only way for us and it has delighted thousands of customers throughout the years. We believe we have the winning formula of professionalism, advanced technology and industry expertise and it's all at your disposal.

How confusion easily creeps in to a quote
The technical complexity of the specialist services available at Hone-All, including deep hole boring, deep hole drilling and honing, are unsurprisingly something of a mystery to some people. That's perfectly understandable unless you have worked within a specialist machine shop and put in the hours learning about and perfecting these techniques.

This sometimes makes it difficult for customers who want to utilise these services. The variations of the different levels of machining available can dramatically impact the costs quoted at the initial stage but understanding the implications of those differences is not always intuitive from a brochure or website. There can be a whole host of factors that may at first appear to be just complications and cause for confusion. They can lead to a cost versus quality conflict from simply specifying the level of machining, the technical specification and the overall impact on the finished component. That is why we never just key some numbers into a spreadsheet and take the first answer it pops up.

Every single job deserves thorough investigation
Issuing quotes on request is simply a cost of doing business but it's a considerable cost to us. This is because genuine lasting quality starts with a true and perfect understanding of the requirement. We study drawings and almost always follow up with a series of questions. Our desire to gain clarity and certainty is your guarantee that you will get what you want, not just from us but from the whole process and resulting product.

We have often seen quotes being returned quicker and at a cheaper rate than ours. If we are able to speak to the customer and explain why our costings may be a little higher than our competitors, in most cases it is because we have included additional operations after considering the overall finished quality of the component and how the results of our machining will impact our customers machining further down the production sequence.

We appreciate that for some people the cost is everything and the only consideration. We don't go along with that because going with the lowest initial cost can come back to bite one all too often.

Aerospace industry standards EN 9100 for your benefit
Regardless of your industry sector, all our procedures and order processing adhere to this superior standard. Not all suppliers apply this strict aerospace industry standard to all their orders unless it is specifically required, whereas we follow EN 9100 procedures for all components irrespective of sector or specification. This effectively eliminates the risk of product defects causing you problems down the line.

A case in point
For deep hole boring on bores from 20 mm-200 mm+ diameter, a standard industry tolerance quoted would be ± 0,25 mm. Therefore, any tolerances lower than these parameters will most likely result in a need

for honing. However, adding honing to the cost of the subcontract machining can often result in our quotation not being as cost-effective as the prices offered elsewhere. The choice here is, do we simply quote our standard tolerance and guarantee to win the work with the lowest price, or do we quote on a basis that will ensure the quality the customer really requires? If the tolerance isn't achieved, the first approach avoids an unwelcome surprise additional cost or delay to the promised lead time when we are halfway through the order. The same applies to surface finishes.

At Hone-All, we always choose to err on the side of caution as quality must be paramount and the costs and lead time known in full at the start of the project.

Quality or price: Do you have to choose?

Quality versus price does not have to be a compromise. At Hone-All we find that the solution comes through honest and open communication. We are transparent about our work and will be upfront about your likely project costs. This being said, our goal is to help you achieve the maximum possible value within your budget. So, based on an assessment of your needs, we will suggest solutions that come in at the lowest achievable cost, bearing in mind your quality requirements and delivery schedule.

Find out more

We are a family run business valuing team collaboration, approachability and cooperation to achieve precision results for our customers. We have a highly trained team of engineers who we value for their innovative insights and technical expertise. Our approach to problem-solving involves input and support from the whole team, meaning our customers receive the full benefit of our skills and experience, rather than a limited solution.

We work in a number of sectors, including aerospace, oil and gas, pharmaceutical, medical, packaging, printing, hydraulics, automotive manufacturing, motorsport and defence.

All our services are undertaken at our facility in Leighton Buzzard, giving us complete control over our supply chain, procurement and lead times. It enables us to offer highly competitive rates that meet and exceed the demands of our customers.

You have nothing to lose by calling us today on 0845 5555 111 for a brief informal chat about your specific requirements. We are always delighted to take on new challenges that exercise our team's ingenuity and innovative skills.

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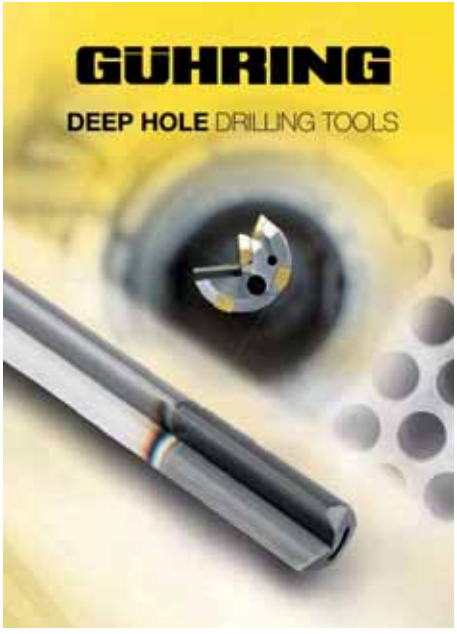
The standard in deep hole drilling

Already recognised as a leader in hole making, Guhring has now reinforced its position with the publication of a new deep hole drilling catalogue. The new 250+ page publication is dedicated to the standard product lines in the deep hole drilling portfolio that are available from the Birmingham-based cutting tool manufacturer.



With more than 250 pages of new, expanded and existing deep hole drilling product lines, the new catalogue is crammed with all the latest lines that are all available 'off-the-shelf' as standard. The breadth of the standard product ranges from Guhring sees this latest publication introduce deep hole drilling lines from 0.9 mm to 52 mm diameter with overall drill lengths of beyond 3 m in variants that include solid carbide gun drills, brazed gun drills, modular drills, spiral fluted solid carbide and HSS drills as well as pilot drills and accessories.

With too many new and expanded product lines to mention, the highlights of the new information-packed catalogue include details on the EB100 and EB100M series. As the smallest and most robust of the Guhring lines, the EB100 is available from 0.9 to 16 mm diameter with an 80XD that takes the flute length to 580 mm. Suitable for most material types, this brazed solid carbide single fluted gun drill is the perfect complement to the EB100M series.

The EB100M is an ultraprecise variant for drilling particularly tight tolerance holes, and it offers an MQL shank end to further enhance performance. Both drills are complemented by the EB80 and EB80 XXL brazed single fluted gun drills. These drills have been expanded with new forms and coatings added to the conventional series that covers hole diameters from 2 to 40 mm with total drill lengths up to 3.6 m.

The ZB80 series that was previously introduced specifically for cast-iron drilling has also been expanded with diameter ranges from 6 to 30 mm and overall lengths up to 1 m for this 2-fluted brazed carbide specialist range.

Already perceived as the ultimate in flexible deep hole drilling, the Guhring EB800 single fluted gun drills with interchangeable inserts and guide pads have now been expanded yet further in this latest catalogue with more new insert grades, coatings and geometries to maximise hole making performance. With each different drill body covering a 0.5 mm diameter in the 12 to 52 mm scope of the series, Guhring has now introduced expanded drill dimensions with new EB800 insert grades and coatings that are complemented by matching guide pad and inner insert upgrades.

Completing the drilling line-up is the HSS and solid carbide spiral fluted deep hole drills and the pilot drilling tools. With the pilot process being so critical to the precision and concentricity of the hole, Guhring presents a variety of options that include solid carbide and HSS stub-length drills, indexable drills, centre cutting end-mills and piloting end mills. All are designated to maximise your precision and performance. Of course, being a leader in holemaking, Guhring has also crammed the new publication with all the accessories and extra equipment that will help you generate your perfect hole. This comprehensive range of additional extras includes everything from drill bushes, steady rest bushes, moulded steady rest bushes, sealing disks and plugs, adjustment screws, torque wrench sets and even drill grinding and re-sharpening equipment.

As you would expect from a leading brand, Guhring has incorporated a technical section with tables, charts and useful data for maximising your machining performance. This extremely comprehensive section is the ideal guide for your deep hole drilling applications as it includes information on drilling processes, pilot holes and drill bushes, coolant and lubrication data, head forms, re-grinding and re-tipping, application recommendations and much more. If you would like a copy of this comprehensive deep hole drilling catalogue, please contact your local Guhring representative.

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Made in Germany and used throughout the world

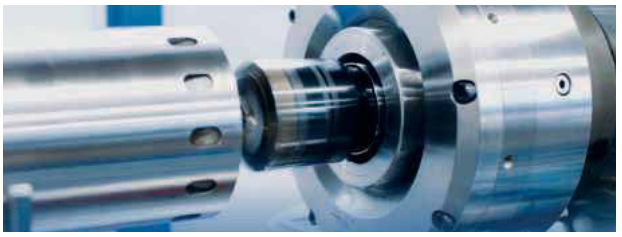
TIBO Tiefbohrtechnik GmbH is a company with operations throughout the world, specialising in the design and production of modular deep hole drilling machines.

Founded in 1994 and with its headquarters in the town of Pfullingen in Baden-Württemberg to the south of Stuttgart, today it is one of the leading suppliers of single-spindle and multi-spindle gundrilling and BTA deep hole drilling machines for a broad range of applications.

Embedded into a medium-sized group with currently 13 companies and more than 1,000 employees, its customers benefit from the shortest reaction times in all aspects of their deep hole drilling machine.

As a South German machine constructor, it manufactures exclusively in its own plant at its headquarters. Its suppliers also manufacture mainly locally, which means the company can proudly claim that its machines are made in Germany.

Whether it's gundrilling or the BTA method, whether it's a single-spindle or multi-spindle system; the precision, speed, quality and durability of Tibo deep hole drilling machines will impress you, as well as their unique design consisting of modular system components that have been proven in practice many times over.



The Tibo modular system allows almost limitless configuration possibilities, from the universal standard machine through to highly-specific special machines. This enables it to offer every customer an optimum machine design to suit their own individual drilling task.

Since all components are normally available from stock, speedy project realisation is ensured. The average time from placement of an order to delivery is just 4 to 6 months.

Tibo deep hole drilling machines have been in use on all five continents for decades. Whether in China or Dubai, Australia or Singapore, Mexico or the USA, the company supplies custom and optimum solutions for your specific deep hole drilling work.

A highly qualified team with unique know-how and decades of experience provide outstanding product and service quality to give customers the decisive edge when it comes to realising their projects. Central project control and a global sales network guarantee excellent product and service quality across the board.

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FANUC produces 750,000th robot

Automation specialist enhances its position

FANUC Corporation, one of the world's most prominent suppliers of automation technology, continues to enhance position with the production of its 750,000th industrial robot, which is more than any other manufacturer in this segment.

At present, FANUC produces around 8,000 industrial robots every month at its factories in Japan, although monthly capacity is available up to 11,000 units. The company is renowned for its highly automated production facilities, where thousands of robots demonstrate reliability, dexterity and speed in the build of FANUC products that include robots, controllers and machine tools. The 750,000th robot will be delivered to a European customer.

FANUC's largest customer group are car producers and their suppliers, although manufacturers from other industries, such as electronics, food, pharmaceutical and medical, are also growing their base of industrial robots. While the coronavirus pandemic initially led to a decline in robot orders, FANUC has since witnessed a strong rebound in sales, especially from Asia and the USA.

"In Europe, the recovery has truly begun," states Shinichi Tanzawa, President & CEO of FANUC Europe Corporation. "Although FANUC's overall order intake for robots in Europe increased only slightly during the past fiscal year, sales in the past few months are at a historical high."

FANUC is pursuing ambitious plans in Europe, where the company is steadily expanding its sales and service network. In the past four years alone, FANUC has invested more than €120 million in new facilities across Europe. Further underpinning its growth plans, the company will invest another €100 million in the coming three years.

Shinichi Tanzawa says: "We are confident that the trend towards robotisation will grow further and that FANUC robots will help customers to automate their manufacturing plants and save cost like FANUC does at its own factories. We will do everything necessary to support our customers in these endeavours."

Vehicle electrification specialist turns to FANUC cobots to increase productivity

Specialist electric vehicle battery manufacturer, Danecca, has invested in two FANUC collaborative robots to improve the accuracy and repeatability of its heat staking applications following a major customer order.

The battery manufacturer, founded in 2018 by ex-Jaguar Land Rover and National Grid engineer Danson Joseph, specialises in battery development, verification and validation, as well as rapid prototyping and production.

Following the successful purchase and integration of a FANUC M20iD 6-axis industrial robot, integrated with a TRUMPF PFO laser for welding electrical connections, the company has now invested in two state-of-the-art FANUC CRX 10iA collaborative robots.

Given the close proximity between operator and Robot, the lightweight CRX-10iA has been designed with safety front of mind. Movement automatically stops upon contact with humans or unexpected objects and will instantly move back to avoid trapping. The CRX cobot range is certified according to the ISO 10218-1 and EN/ISO 13849-1 safety standard and the smooth and elegant design avoids pinching and injury, making it an ideal partner for production workers.

Danecca purchased the two CRX cobots to improve the accuracy, repeatability and takt time of its heat staking process, while also freeing up more time for technicians to focus on value-added tasks.

James Hampshire, electronics engineer at Danecca, comments: "Heat staking has traditionally been a labour-intensive application for us, with long takt times that can become quite fatiguing for the operator when done manually. Following the successful tender for a demanding order, we quickly identified collaborative robots as a viable solution to work alongside our battery technicians to significantly increase our output without compromising on quality.

"The CRX cobots now enable us to heat stake up to 23 units at any one time and have helped to eradicate any inconsistencies. This is incredibly important as any irregularities in the process would render that particular unit redundant, adding unnecessary time and cost into the process. Not only have we seen a significant increase in repeatability and accuracy, but the takt time has also reduced by over 10 minutes per cycle."

"From a programming perspective, the CRX cobots are incredibly intuitive to use and we know that once we have told it do something, it will do it and do it correctly.

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Compact automated turning cells with integrated robot arm

In a world first, Japanese machine tool manufacturer Okuma has incorporated a robotic arm inside its CNC turning centres for automated production of shaft- and chuck-type components. All of the manufacturer's machine tools are sold and serviced exclusively in the UK and Ireland by sole agent NCMT.

One of the first Okuma lathes to benefit from an internal Armroid (Arm Robot Intelligent Design) workpiece load / unload system is the LB 3000 EX II, one of which is available for demonstration in the agent's Coventry showroom.

Three different end-of-arm effectors are available for performing different tasks. One is for blasting air or coolant within the cutting zone. It can be programmed to follow the cutting tool for breaking up stringy swarf or to clean down the whole working area, greatly improving chip management. A roller end effector provides support under a shaft component during cutting to minimise chatter.

In combination with a workpiece stacker, the third end effector is a two-finger gripper

for automatically holding shaft-type workpieces around their circumference for loading and unloading, weight capacity being 5 kg. All three end effectors are stored within the machine and are exchanged automatically by the robot.

A longer, more powerful Armroid can be integrated into a second Okuma turning centre, a Multus B250II multi-tasking lathe. The robot arm handles workpieces up to 10 kg and possesses a fourth type of end effector with a 3-jaw gripper for holding billets around their end faces.

Armroid systems are ideal for high mix, small batch work. The extended periods of unattended running free the operator to carry out duties in other parts of the factory. The cells are not, however, intended for lights-out production of large quantities of the same part due to the limited number of workpieces that can be accommodated by the stocker.

While most conventional robotic systems require complex integration and special training for staff, Armroid needs neither. As the robot is part of the machine tool, expensive system integration is unnecessary. Using Okuma's own OSP-P300A control, an operator enters the coordinates for the start and finish points and the robot moves through its motions unerringly. Roid Navi software simplifies programming using images and on-screen guides.

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Wogaard and Seco Tools urge companies to work together to make manufacturing more sustainable

It is unusual to live through a day on this planet in 2021 without reading or hearing something about the environment or climate change. That is exactly how it should be, because it shows the human race is finally aware of the impact its activities have had and continue to have on the world.

Environmental awareness has led to an ever-increasing focus on sustainability within business and the manufacturing industry is a key battleground. According to the US Department of Commerce, sustainable manufacturing can be summed up as: "The creation of manufactured products that use processes that minimise negative environmental impacts, conserve energy and natural resources, are safe for employees, communities and consumers and are economically sound."

The personnel at Wogaard are acutely aware of this. Their primary focus is sustainability and the flagship Coolant Saver product has the brilliant dual effect of saving customers money while making their manufacturing processes more sustainable by reclaiming coolant that would otherwise be wasted and sending it back into the machine it is connected to. It is the kind of simple yet supremely effective product many companies wish they had invented.

"Over the last decade we have assisted hundreds of businesses in reducing the environmental impact of their manufacturing activities," explains Wogaard managing director Jason Hutt. "We are committed to this because who knows what may happen next? What if nature failed us or just gave up on us? Have you ever stopped to consider this? This is our big why and we like to say that we are in the business of preserving nature for our future generations."

"That is why there is always a higher purpose to what we do. Of course, we want to support clients making cost savings and improving their manufacturing processes, but together we have a bigger mission, which is to become more sustainable to support the environment."

In a bid to encourage everyone in the manufacturing industry to become more sustainable, Wogaard set up a free-to-join Sustainability Platform that provides companies with resources such as events, podcasts, information libraries and a partner directory that enables them to collaborate with others.

One of Wogaard's biggest partners, Seco Tools, signed up to the platform a long time ago and they share the company's passion for sustainability.

"Sustainability isn't just for the big companies," explains David Magnall, innovation partnership manager at Seco Tools. "We can all make a difference. I think a lot of people worry that addressing sustainability issues in their manufacturing is going to cost them a lot of money and while there may be an initial investment in certain technologies, there is also a payback as well. I think it makes a big difference if people understand that. So, it's about really getting a grasp of that relevance: What does it mean to me as a manufacturer, particularly a smaller one? Where can I do my bit and what's the impact?"

Seco Tools is also keen to point out that sustainability is not just about the environment. "There are other ways to be more sustainable, for example with people diversity and inclusion" explains Doré Collett, marketing and communications at Seco Tools. "When you have more diverse views at the table making decisions, you have a key element of innovation, because it opens a door to so many more perspectives. In turn, these perspectives will often widen the view, making environmental and economic sustainability more achievable."

"It's like a sustainability wheel, isn't it?" concludes Jason Hutt. "With the environment, society and people and it's important that we get the balance right."

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FOLIA metalworking solution improves factory air quality

Lubrication Ltd has been an authorised distributor of products from the lubricants division of Total UK, part of Total Energies, since it was founded in 2001. It supplies a wide variety of lubricants, greases and oils for all industries.

Nigel Hall, managing director at Lubrication Ltd, had been consulting one of his clients; a machinery parts manufacturer in the West Midlands on how to eliminate fumes and smoke from their manufacturing facility and production processes.

The customer carries out a range of machining applications including vertical and horizontal turning, milling and boring, using several materials including manganese steel, carbon, cast white chromium iron, martensitic alloy steel and bronze.

Despite having fume extractors on some machines, the setup was not very effective, so the customer was considering making a significant investment in a better solution. In addition to being a major investment in terms of installation, such a system would dispense smoke into the atmosphere, which Nigel Hall recommended they should avoid.

Nigel Hall recommended FOLIA, a metalworking solution Total UK introduced to the UK market in 2019. Based on bio-sourced polymer technology and free of mineral oils and solvents, FOLIA from Total supports health and safety compliance. Initially, Nigel Hall and his team filled two lathes and two brand new vertical machining centres, at around 700 litres capacity each, with FOLIA.

Because of FOLIA's solubility, the concentration used was between seven and eight percent, with a low top-up rate of around 1.8 percent in order to maintain the concentration in the tanks at around eight percent. Nigel Hall explains: "The top-up rate would be up to three percent with alternative coolants, so although FOLIA is a premium product, it is more economical in terms of usage."

FOLIA will not mix with the slideway lubricant and, although it is still present, it is rejected to the surface of the coolant, which can be skimmed off, unlike with many other products.

Lubrication Ltd now monitors the coolant on a weekly basis and reports are provided to management detailing the appearance, concentration, pH, bacteria, fungus and mould, temperature, the degree of tramp oil and overall cleanliness.

After the first phase of the project, the customer carried out an evaluation to understand how FOLIA had performed. Nigel Hall concludes: "They quickly discovered that FOLIA B7000 does not produce any visible smoke or fumes.

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ROCOL makes savings for A&M EDM

As an engineering solutions company, A&M EDM Ltd is always striving to enhance its operations and capabilities to maximise its service to clients in the aerospace, motorsport, automotive, marine, medical, rail, defence and general subcontract sectors. To achieve this, the West Midlands company has invested in technology from 3-, 4- and 5-axis machine tools, EDM wire and spark erosion and laser welding through to temperature-controlled metrology department. When the company wasn't getting the best out of its machine tools and cutting tools, the company worked with MSC Industrial Supply Co. UK (MSC) to instigate a change of cutting fluid supply, the result was a relationship with the cutting fluid experts at ROCOL.

Playing a proud role in the Ventilator Challenge and having more than 57 CNC machines on the shop floor as well as a host of accreditations and accolades, the Smethwick manufacturer utilises MSC to deliver best practice engineering support with frequent onsite visits to proactively identify ways to help A&M EDM to optimise their processes. When it came to improving the performance of its metalworking fluids while maintaining high-quality machining, MSC identified ROCOL as the perfect partner to collaborate with A&M EDM.

Like many subcontract manufacturers, A&M EDM machines a variety of materials that include stainless steel, mild steel, aluminium, inconel, titanium and exotics with a variety of production demands from bespoke one-offs and short runs through to longer run batches for its customers. This variety of materials poses a challenge for any cutting fluid supplier, but ROCOL recommended its ULTRACUT EVO 255 metalworking coolant, an extreme pressure (EP) soluble oil-water mix cutting fluid that replaced the previous coolant. ROCOL and MSC recommended this product as it is not only versatile and suitable for a wide variety of machining applications and materials, but it would also deliver significant saving in the volume of coolant required.

When asked why the company changed cutting fluid suppliers to ROCOL, Gary Surman from A&M EDM says: "We had three fundamental issues. Firstly, we had operators that were complaining about irritated skin. There was also a smell in the workshop. Thirdly, our tool life seemed to be diminishing relatively quickly.

"We are delighted that MSC and ROCOL have come in and analysed our coolant consumption and recommended a solution that will reduce this to half the amount we were using previously. They invested time in understanding what our objectives were and demonstrated a commitment and determination to help us achieve them. We look forward to an ongoing relationship where MSC and ROCOL will continue to assess and benchmark our machines regularly, helping us to achieve further efficiency and productivity gains."

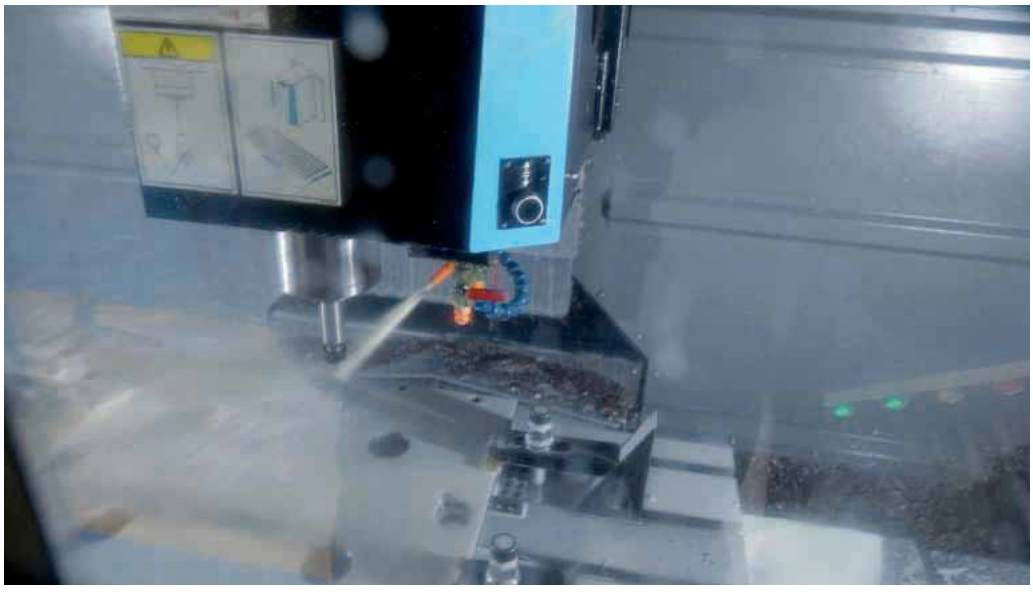
ROCOL analysed A&M EDM's coolant consumption, accounting for the materials and applications while taking samples from active machining operations. The tests at ROCOL's laboratory delivered a comprehensive report on the current fluid product, with details such as the wear ratio, dilution and consumption. The analysis concluded that coolant usage was much higher than it should be and that A&M EDM needed a versatile, high-performance coolant that would deliver consistent usage and quality results on a range of different materials.

Commenting on the ULTRACUT EVO 255 Gary Surman says: "Once we got the product into the machines, we had no further concerns about skin irritation, the smell had dissipated and we also noticed that our tool life improved. We can only put that down to the EP (Extreme Pressure) additive that is in the coolant, this gave us that tool life improvement."

Machine operator Callum Bowen reiterates the point on odour: "The ROCOL coolant has made a difference. When I get home from work, I no longer smell and the smell does not stick to my clothes, unlike the previous product we were using. The previous fluid created a lingering smell when I returned home from work. This wasn't very nice to take home.

"Additionally, the fluid is very good when cutting different types of material. The science behind the coolant is making it much

easier for the tools to last a lot longer. Furthermore, the ROCOL coolant does not fog-up the glass screen on the machine doors, so we can see what is going on in the work envelope. This means I can see that the job is running as planned, rather than waiting until the machining cycle has finished."



The ROCOL ULTRACUT EVO range of operator-friendly water-soluble cutting fluids are inherently resistant to degradation and contain no biocides or skin sensitisers and this makes the fluids pleasant and safe to use. These attributes demonstrate low foaming qualities and reject tramp oil as well to provide excellent cutting performance and residual corrosion protection.

Gary Surman says: "Our operators have had no noticeable effect on their hands where they were getting skin irritation before. Even looking inside the machines, they are much cleaner than they were before and we can only put that down to the old coolant congealing and sticking to the walls and surfaces of the machine."

The analysis showed that with the ROCOL ULTRACUT EVO 255 solution dilution levels improved from 19:1 to 40:1, reducing A&M EDM's consumption from 41,000 litres per annum to 20,048 litres per annum. The reduced consumption rate outweighed the increased cost per unit, resulting in a significant cost saving of £16,900 per year.

Gary Surman adds: "We had an overall look at this, and we used to buy around 10 Intermediate Bulk Containers (IBC) every year and we are now down to five. We are spending around £17,000 a year less on coolant. However, it's not just the cost of coolant we are measuring here.

"There has been a significant drop in the costs and purchasing of our cutting tools, which we can only put down to the cutting fluid and EP additives that are allowing the cutting tools to last longer. We have found that our tool life has significantly improved. I can confidently say that, as we have had a 40 percent reduction in our tooling spend where roughing operations were being carried out."

Referring to the waste management of cutting fluid, Gary Surman adds: "When the suds kept going-off, we had to dispose of it under our ISO:14001 environmental standard. Now, we are no longer disposing of 10 to 15,000 litres a year due to coolant that has perished."

Discussing the service the company has received from MSC and ROCOL, Gary Surman explains: "If we have a problem, ROCOL is only a phone call away and they will pop-in on the same afternoon or the following day. It's perfect."

ULTRACUT EVO 255 is formulated to give a long and predictable sump life and provides extra performance in medium and severe cutting operations on a wide variety of ferrous and non-ferrous materials. It has proven ideal for this subcontract manufacturer. In addition to providing the coolant solution, MSC works with ROCOL to deliver specialist and ongoing maintenance and support to A&M EDM, which covers a range of services and periodic analysis to further reduce fluid consumption, extend tool life and reduce downtime. This will help A&M EDM ensure the product continues to perform to its optimum level, no matter what materials are machined.

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Guide to machining titanium

Machining titanium cost-effectively requires special attention to the distinctive features of this material – particularly for choosing the right tools

The finicky superalloy

Anyone who has ever machined the superalloy titanium knows that it can be a real diva, requiring special care and attention. Chips that won't break, heat that won't dissipate and built-up edges are some of the common ways in which titanium puts up a fight during machining. However, titanium's remarkable properties make it a favorite in aviation, motorsport and medical technology, so it is worth learning how to machine it properly. You never know when a renowned sports car manufacturer will need to place an order for titanium screws.

Whether or not the chemist Martin Heinrich Klapproth named the titanium element after the deities from Greek mythology due to its god-like properties is unclear. But the fact is that its properties make it a superalloy. Extremely tension-proof, very light and outstandingly resistant to corrosion, titanium offers something other materials and alloys don't. Titanium is antimagnetic, biocompatible and resistant to even the most aggressive media. This expensive material is becoming popular in more fields and applications. It's no secret to the engineers at Bugatti, who use many titanium parts in their work.

Avoid waste

Machining titanium is an investment, as it costs about three to five times more than tool steel. So logically, you want to avoid waste. The careful selection of a suitable cutting tool is only the first step. Manufacturing precision turned parts made of titanium, which are frequently needed in aviation and spaceflight, the chemical industry, vehicle construction and medical technology, requires tools that are suited to machining this particular material, allowing for the most stubborn titanium alloys to be machined as needed.

However, this diva of the materials world can do a number on your cutting tools due to high heat resistance, chips not breaking, its distinct tendency to stick to cutting tools and a low elastic modulus.

Since only a privileged few manufacture titanium screws for the 1500-HP Bugatti Chiron super sports car, let's instead take a look at the manufacture of a threaded and grooved shaft made of the standard titanium alloy Ti6Al4V Grade 5/23 as is frequently used in medical technology. With a tensile strength of Rm = 990 N/mm2, yield strength of Re = 880 N/mm2, a hardness of between 330 and 380 on the Vickers hardness scale and elongation at fracture A5d of approximately 18 percent, this titanium alloy is typically used for medical implants as well as aviation applications, 3.7164 and industrial applications 3.7165. With six percent aluminum, four percent vanadium and Extra-Low Interstitial elements (ELIs), this alloy is highly biocompatible, inducing virtually no known allergic reactions.

Evacuating heat from the cutting zone

This requires a high-quality surface finish, reliable process safety and controlled chip removal, all while keeping process times short despite potentially high rates of chip removal. You might assume that most of the heat generated in the turning process is evacuated via the chips, but this isn't so. Since titanium is a poor thermal conductor, the heat cannot be alleviated from the cutting zone via the chips and, at temperatures of 1200°C and higher in the cutting zone, the cutting tool can quickly sustain heat-related damage. The easiest thing you can do to prevent too much heat from building up is to feed coolant directly to the cutting zone, reduce the cutting force by using a sharp cutting edge and adjust the cutting speed to suit the process at hand.

Choosing the right tools to increase service life

Real improvements are made by selecting the correct cutting tool. Since the heat must be evacuated via the cutting edge and the coolant, not via the chips, as is the case with steel, a small portion of the cutting edge must withstand extremely high thermal and mechanical stress. The cutting pressure is reduced by using ground, high-positive indexable inserts with polished flutes, if necessary, with the appropriate coating, minimising friction in the chip removal process. These three parameters help prevent heat from being produced in machining. If only a little bit of the heat is reduced further through optimal coolant flow, the cutting edge will have a longer service life. Or the cutting speed (Vc) can be increased again to improve productivity.

So far so good, but since these titanium chips don't like to break, you may face other difficulties. An endless chip could wind itself around the workpiece, your tool, or the machine chuck and pose a hazard to the machine or your safety. It could help to change the direction of rotation and turn the cutting edge around if the machine's design allows it. If the cutting edge is pointing

downward, chips will fall freely to the ground and no longer pose a danger. However, when working with demanding roughing applications and less-than-stable machinery, you will have to check whether the cutting action allows the chips to be directed towards the machine bed. Once the chips have left the work zone, they can no longer disrupt the process.

Find a tool manufacturer that offers advice and process support

If you want to make sure that you choose the right tool for titanium machining, turn to a manufacturer. Some go above and beyond, offering advice based on specific application experience in addition to supplying the cutting tool itself. For instance, ARNO Werkzeuge is a tool manufacturer that has been around since 1941. In addition to manufacturing one of the largest selections of high-positive indexable inserts, it employs many experienced application consultants who would be happy to share their knowledge to ensure that customers' manufacturing processes run smoothly.

Its high-positive indexable inserts are sharp enough to keep cutting force to a minimum and their optional rounded edges ensure excellent stability. Expedient high-tech coatings make them well-equipped against the poor thermal conductivity of this tricky material. Negative indexable inserts with EX, NFT, NMT, and NMT1 geometries provide an affordable, reliable solution for more basic machining and roughing. Arno's positive indexable inserts with geometries PSF and PMT1 are ideal for machining superalloys. All of these inserts are highly resistant to notch wear and heat when machining tough material. Unique geometries ensure exceptional chip control and process safety. Dedicated titanium machining experts and ARNO customers are well prepared. After all, you never know when you're going to get that call from a Bugatti engineer.

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Sustainably improving aluminium machining in the automotive industry with the right tools

The automotive industry faces a dilemma to save fuel as vehicles must become lighter. At the same time, new components and technologies make them progressively heavier. The solution comes in the form of components from aluminium. Tool manufacturer Sandvik Coromant shows how special milling cutter designs can be part of the solution.

At 10 percent reduction in vehicle weight can lead to fuel savings of six to eight percent. That is why manufacturers are increasingly turning to aluminum, one of the most important materials for lightweight construction. However, aluminum alloys require complex machining with complex and cost-intensive processes and various tools. In addition to very time-consuming tool setups, inferior surface finishes, burr formation and inconsistent tool wear are not uncommon. So how can automotive manufacturers achieve shorter lead times, better quality and higher savings?

Two-in-one solution

For precise, trouble-free and burr-free milling, Sandvik Coromant offers several patented milling cutter designs, including the M5C90. The face milling tool was developed for roughing and finishing cylinder heads and blocks as well as solid aluminum parts with long milling operations. It is capable of performing the entire machining process, from roughing to finishing, in just one operation and, in many cases, with an axial depth of cut of up to four mms. This way, tool life can be increased fivefold in some cases while cycle time is reduced by 200 percent.

A key feature of the M5 cutter series is its step technology. The Polycrystalline Diamond (PCD) inserts are arranged in a spiral and staggered vertically to remove material from the workpiece both axially and radially. The last tooth offers a wiper geometry in order to achieve high-quality, flat surfaces. In addition, the fixed position of the wiper cutting edge eliminates the need for time-consuming setups. The M5 series also includes the M5Q90, a tangential milling concept for roughing; the highly stable M5R90 face and shoulder milling cutter, the M5F90, a combination milling cutter for roughing and finishing in smaller dimensions and the M5B90 face milling cutter concept for fine finishing.

With the M610, the Swedish company also offers a milling cutter solution for the finishing of bimetals or material composites made of aluminum and gray cast iron. The concept, which delivers high feed rates without chipping, burr formation or surface scratches, also requires no setup or adjustment of the inserts.

In addition to insert solutions, solid carbide tools are available for both drilling, milling and threading. The CoroMill® Plura range of solid carbide end mills includes tools for roughing to finishing and thread milling.

As aluminum alloys help solve the weight dilemma in the automotive industry, Sandvik Coromant's complete range of tools for aluminum machining enables companies to successfully meet the demanding requirements in this field.

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3,100 patents worldwide, employs over 7,900 staff and is represented in 150 countries.

What once began in a modest shop in Sandviken, Sweden, has over time transformed into an industry leader. At the very core of the company's DNA lies a passion for engineering and pushing boundaries, always in close relation with its customers.

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Boost stability and tool life with optimised solid end mills

In its continued effort to provide the most cost-effective tooling solutions available, Seco Tools has announced a new family of flexible, highly productive solid end mills, the Seco JSE510 series. Redesigned to offer the rigidity, chip control and tool life to achieve the lowest possible costs per meter machined in steels, stainless steels, cast iron, titanium and some aluminums, these solid end mills provide exceptional process reliability across a broad application range.

New design combines reliability and unparalleled versatility

The reoptimised design of the new JSE510 offers unparalleled versatility based on the previous version of this product range. The new series targets general engineering, contract manufacturers and job shops, as well as the aerospace, medical and automotive industries. The design is reoptimised to stand up to tough milling applications with a versatile carbide grade, advanced polished SIRA coatings and a strong, sharp cutting edge. To extend tool life further, these tools offer vibration-damping variable pitch design and optimised helix.

"These solid end mills offer productivity in less-stable machining conditions or when pushed hard to balance productivity and tool life cost effectively," says Rob Mulders, solid end mills global product manager. "This versatility makes the JSE510 series particularly useful when shops face increased costs in required tooling because of a greater variety of applications and materials. For these shops, the new tool series' expanded application window allows them to reduce their tooling inventory without affecting their ability to maximize throughput."

Multiple tools, geometries and lengths

The Seco JSE510 family includes 216 tools in four geometries, with two length variants in the three and four-flute version, normal, LV2 and long LV3. The two-flute JSE512 easily handles the large chips produced in helical interpolation or peck drilling, keyways and slotting applications, while the three-flute JSE513 offers universal milling performance for ramping, full slotting and side milling. The four-flute JSE514 is ideal for optimised side milling and slotting, as well as dynamic milling. Finally, the ball-nose end mill geometry of the JSB512 offers the flexibility required for finishing parts and other ball-nose applications.

For additional information about the features and performance of the new Seco JSE510 series, visit the Seco solid end mills product page.

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New coated tools cover all material types

The 180-10-A Series of single flute routers from Industrial Tooling Corporation (ITC) has now been extended with the arrival of a Vitreo coated router for machining Aluminium Composite Material (ACM) and an Iridis coated variant for the machining of aluminium.

The high-quality solid carbide routers from ITC have long been the 'go-to' cutting tool for the sign making sector with performance that is the benchmark of the industry. As the industry has evolved, so has the materials being processed and therefore the cutting tools for machining the ever-increasing range of materials. As a brand that has been at the forefront of cutting tool technology in the sign-making industry for more than 30 years, the new coated tools from ITC are developed and manufactured in the UK at the company's Tamworth headquarters.

The cutting tool experts at ITC have relentlessly trialled and tested numerous tool geometries and coatings to provide the sign-making industry with the most productive and highest performing cutting tool. The 180-10-A Series single flute router with the new Vitreo coating is a solid carbide tool with an upward spiral geometry that incorporates a 30° helix with a reinforced 6 mm shank. Manufactured from ultra wear-resistant micro-grain carbide, the new Vitreo coated range is perfect for reducing the number of collet changes and prolonging to life when machining Aluminium Composite Material (ACM). Furthermore, the combination of an efficient tool geometry with an extremely hard-wearing coating provides unsurpassed surface finishes that significantly reduce secondary finishing operations.

The Vitreo coated 180-10-A Series is available with 2-, 3- and 4-mm diameters with a 6 mm reinforced shank, an overall length of 50 mm and a length of cut that is 7 mm on the 2 mm diameter tool, 10 mm on the 3 and 4 mm variants. This geometry

further enhances the rigidity and strength of the tool, which subsequently results in the end-user and taking fewer collet changes.

For machining aluminium, the new 180-10-A Series is available with the same tool dimensions and geometry but with an Iridis coating. Unlike the Vitreo coating for ACM, the Iridis coating has been specifically developed for the machining of aluminium at high speeds. The coating technology guarantees exceptional surface finishes that is complemented by the tool geometry that minimises burrs. The combination of the Iridis coating and the tool geometry gives this new arrival longevity and performance that is the envy of the industry.

Long reach face milling from ITC

BIG KAISER has now expanded its line-up of Smart Damper-equipped, arbor-style face mill holders. This new holder that is now available in the UK from Industrial Tooling Corporation (ITC) is the largest and longest milling tool BIG KAISER has offered yet. It supports face mills with diameters of 80 mm or 100 mm with an arbor pilot diameter of 27 mm.

The Model SDF57 assembly has an outside diameter of 71.8 mm and allows users of 75 mm face mills to access up to 500 mm of reach, the longest tool assembly in the industry using standard components. Manufacturers using face mills in the aerospace, oil and gas and even construction industries will see the most opportunity for this new toolholder.

Despite the remarkable reach capabilities of the Smart Damper face mill holders, the system demonstrates extremely quiet, vibration-free milling, even with long-projection assemblies. The integral design of the Smart Damper shortens the distance from the damping mechanism to the cutting edge. This produces higher damping effects upon the tool assembly, minimising chatter and vibration. This provides improved surface finishes and material removal rates while prolonging the performance of the cutting edges. The new Smart Damper face mill holder from ITC is now available for BBT50, BCV50 and HSK-A100 shank styles.

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Maximum precision face mills

The new FMWX face mills from ZCC Cutting Tools are suitable for finishing steel, stainless steel and cast iron. The system is versatile and can be used in a broad range of applications thanks to the wide selection of CVD and PVD coated inserts on offer, with diameters of 50 to 125 mm available.

The ultra-high-precision insert seats ensure high repeatability. As the seats are compatible with the inserts, no subsequent adjustments are required. The milling system is equipped with a wedge clamping mechanism, allowing insert seats to be replaced quickly, which in turn reduces setup times. In addition, targeted internal cooling improves chip removal, resulting in increased tool life.

As a further highlight, the precision-ground wiper indexable insert guarantees high surface qualities. The thickness of the insert provides increased resistance to breakage, while the positive rake angle generates low cutting forces. In addition, the wear-resistant substrate ensures an extremely long tool life and makes the insert with four cutting edges exceptionally economical.

Due to its low power consumption, the FMWX system is also suitable for low-performance machines.

New machining competence catalogue

Passenger comfort, the durability of parts and lower costs in production, maintenance and servicing are three key requirements for railway equipment. More than anything else, safety-related components must be of high quality and precision-manufactured to exacting standards.

Rail vehicle components have to be extremely rugged and reliable while also offering high levels of comfort. Particularly in the contact zone between the rail and wheel, the forces must be low enough to allow for the efficient transport of loads. At the same time, they also need to provide sufficient contact forces for reliable acceleration and braking.

In the rail technology sector, precision tools are needed in the production of new wheels and axles, for machining brake discs and bogies as well as to re-machine wheels. ZCC Cutting Tools offers economical solutions for each of these machining operations. All the information you'll need is now available in its new machining competence brochure.

In addition to this, the company also offers technical consultations tailored to customers' unique requirements. Application engineers and product managers are there to provide specialised expertise to help its business partners make ongoing upgrades and improvements.

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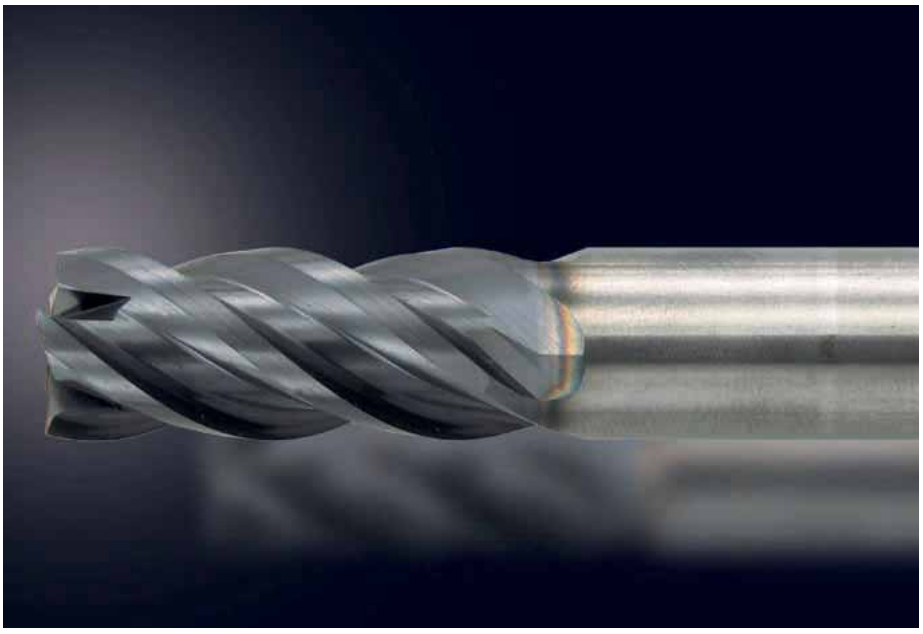
Universal end mills with 50 percent discount

Machining of challenging materials has now been simplified with the expansion of the Union Tool range of CZS cutting tools from Rainford Precision. The innovative series of solid carbide end mills from the Japanese cutting tool manufacturer has been extended even further with new diameters added to accelerate productivity, performance and the potential of this line when machining a wide variety of materials. This exceptional range is now available with a limited time 50 percent discount to make manufacturers aware of the astounding performance improvements that can be derived from this high-quality Japanese brand.



The high-performance end mills that are available from Rainford Precision incorporate a geometry design that combines with a super micro-grain carbide substrate and an ultra-tough UT coating to provide manufacturers with industry-leading performance levels. The combination of the new geometry, coating and substrate makes the CZS series a truly universal end mill range. The CZS end mills are suitable for machining everything from carbon, alloy and pre-hardened steels to 55HRc as well as cast iron, aluminium, titanium and heat resistant alloys and also copper and cast iron among others, making the CZS a high performing all-rounder on most material types.

The new CZS end mills have a 40-degree high helix angle for unsurpassed swarf evacuation. This combines with a variable pitch helix that reduces the harmonic effects and vibration when undertaking high-speed milling tasks. With a flat land as part of the patented tip geometry, the CZS Series is suitable for drilling, milling, side milling, slotting, pocketing and trochoidal cutting operations, reducing the requirement for multiple cutting tools and excessive inventory. Furthermore, the edge geometry and high-quality carbide grade make the CZS ideal for vertical milling with unsurpassed resistance to edge chipping while the low friction coating enhances chip evacuation and improves wear resistance.

The impressive 4-flute square end tools have been expanded with new diameter ranges. From 1 to 6 mm diameter in 0.1 mm increments and 6 to 12 mm in 0.5 mm increments with 13, 16 and 20 mm diameter end mills also available. The series is offered with a length of cut from 3 to 40 mm depending upon the diameter selected and end mills above 6 mm have a range of flute lengths available to maximise rigidity and performance when undertaking challenging machining tasks. This is complemented with an overall tool length from 50 mm for the smallest end mills to 125 mm for the 20 mm diameter tools.

To further maximise rigidity and performance, the end mills from 1 to 6 mm are supplied with a 4- or 6-mm shank diameter that is necked with a 16-degree angle for smaller tools. Tools from 6.5 to 20 mm are provided with shank diameters of 8, 10, 12, 16 and 20 mm, all incorporated into the expanded range.

If you would like to accelerate your machining performance, improve surface finishes, reduce tooling inventory and costs, please contact Rainford Precision for further information on how to take advantage of the 50 percent limited period discount that is running from 4th October to the end of January 2022.

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Universal eXcellence in milling

With the new Xill·tec™ product family, Walter is presenting a new milling range: the MC230 Advance product range solid carbide milling cutters. The new solid carbide end mills demonstrate a high-performance geometry with an asymmetrical helix, 35°/38°, that has been combined with Walter's innovative wear resistant and high-performance WK40TF grade.

The result is a family of high-performance tools that also offer universal applicability for rough and finish machining. The milling experts at Walter have consolidated the developments of the past ten years into the Xill·tec range and the result is an asymmetrical helix. This is the most important feature of geometry as it enables smooth, vibration-free operations. This is essential for extending tool life and process reliability. Fractures are avoided and the high level of operational smoothness contributes to the soft cutting action and low cutting forces generated by the Xill·tec milling cutter.

The solid carbide milling cutters are suitable for all ISO material groups, P, M, K, N and S and cover all common milling operations. This includes everything from shoulder milling, ramping, helical plunging and full slotting up to 1XD while exhibiting high-performance levels. The impressive performance levels and material removal rates are also achievable when undertaking innovative machining strategies such as dynamic milling. The Xill-tec MC230 end mills are available in diameters from as small as 2 mm through to 25 mm and, depending upon the chosen diameter, the

Xill-tec MC230 is available with corner radius options up to 4 mm. The corner radius options prolong tool life and extend performance levels during heavy material removal applications or when machining challenging materials.

The comprehensive range also contributes to the universal applicability of Xill·tec. The milling cutters are available with a variety of options that includes centre cutting edge, reduced neck for enhanced stability, protective chamfer, cylindrical and Weldon shank and also with and without corner radii. The broad application range and an outstanding price/performance ratio makes the milling cutters an appealing option for users across a wide range of different industry sectors.

Walter GB Ltd Tel: 01527 839450 www.walter-tools.com

ErgoLine

If you are looking for functionality and aesthetically attractive plastic cases to protect sensitive equipment and instrumentation, rose plastic has the solution with the RoseCase ErgoLine. The ErgoLine is extremely adaptable to specific product requirements and it can be configured to your exact needs. The ErgoLine range is also available in Bio HDPE and Post-Consumer Recycled (PCR) material.

The ErgoLine is available in a vast range of standard sizes with bespoke solutions available. To ensure unparalleled protection for your products and instruments, the ErgoLine is manufactured from a robust, hardwearing Polypropylene with the option of plain, convoluted or die-cut foam protection inserts.

The RoseCase ErgoLine combines functionality with fashion, incorporating modern design while offering customers a complete range of colour combinations, interior designs, polished or textured surfaces, ergonomic handles with 'soft-touch' options, concealed hinges and sturdy feet and a selection of lids and bases that can be custom printed with logos. If you want to combine functional user-friendly design with attractive aesthetics, the ErgoLine protective cases are the solution for your business.

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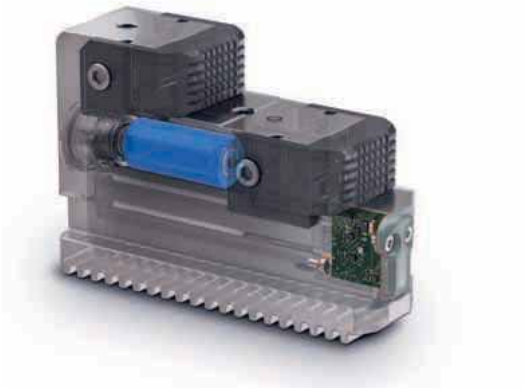
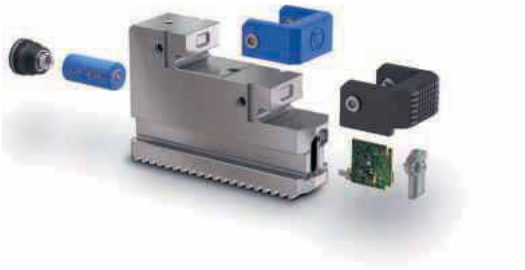
Röhm introduces the iJaw measuring clamping jaw in Milan

At EMO 2021, the clamping technology specialist Röhm presented the iJaw clamping jaw for the first time. It allows the clamping force to be measured in real time during machining. Röhm thus solves a problem for which there has been no accepted industrial solution up to now, the clamping force is usually set by the operator of the machine tool and is a matter of experience. Errors during machining due to incorrect clamping force or workpiece loss are therefore pre-programmed. The iJaw presented by Röhm integrates sensor technology for clamping force measurement as well as wireless data transmission in a full-fledged clamping jaw. The measurement takes place directly at the clamping point to the workpiece, the data transmission to a gateway makes use of the upcoming industry standard IO-Link Wireless. The gateway can be connected to the machine control system via the integrated Profinet interface and/or sends the data to a cloud via the integrated LAN interface.

Even on the most modern machine tools, workpieces are clamped today in the same way as they were a hundred years ago as the operator clamps "by feeling". Due to the lack of sensors, the machine tool can only support the operator to a limited extent. To ensure that workpieces are securely clamped, no one wants to risk ejection, the clamping force is often set too high. Especially with thin-walled components or sensitive surfaces, this quickly leads to deformation and crushing.

With the iJaw, the clamping specialist Röhm presents a clamping jaw with integrated sensor technology for measuring the clamping force directly at the clamping point. There is simply a clamping insert that is only a few mms thick between the sensor and the workpiece. Röhm thus eliminates almost all falsifying influencing factors and the iJaw can provide information about the actual clamping force applied to the workpiece. The iJaw transmits the measured data wirelessly to a gateway via the robust IO-Link Wireless protocol with a high sampling rate of 100 Hz. This means the iJaw measures in real time during machining. To this end, it has a suitably robust hardened steel and waterproof (IP 68) design. The transmitting antenna has a cover made of high-temperature plastic to protect against glowing chips. The iJaw can be mounted and used on all lathe chucks with a suitable, standard, jaw interface like any other clamping jaw. For the market launch, the iJaw is available as a stepped jaw for lathe chucks with straight or helical toothing in sizes 215, 260, and 315. Suitable lathe chucks from Röhm are the Duro-A RC, Duro-NCSE, and Duro-NC power chucks with the jaws quick-change system, as well as the counterpart from the conventional range, the Duro-T. To adapt the jaws to different workpiece geometries, there are various exchangeable hard and soft clamping inserts that are locked onto the jaw with screws.





The gateway with the IO-Link Wireless receiver is used to receive the data and forward it. The gateway offers a Profinet interface for connection to the machine. Via this interface, the data is available at the machine control system and can be displayed on the HMI of the machine tool and/or further processed by the machine control system. The iJaw can be connected to the Internet via a LAN interface on the gateway, making it a true IoT solution. The data can be sent via this to a cloud where it can be archived and further processed.

Since the end of 2020, Röhm has had an exclusive development partnership with machine tool manufacturers DMG MORI, WFL, and EMCO. They tested the iJaw on their machines in the final phase of development and accompanied Röhm to the series production stage. DMG MORI presented the iJaw to invited guests on a CTX beta 1250 TC 4A at the Pre-EMO event held in September in Pfronten.

Röhm sees the IO-Link Wireless protocol as the coming standard in wireless communication in the industrial environment. Compared to Bluetooth, which is widely used today, IO-Link Wireless is significantly more robust and stable. Röhm is convinced that IO-Link Wireless will become increasingly prevalent in upcoming IoT products.

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Upgrading to hyperMILL

When Shearline Precision Engineering Ltd recently added to its advanced 5-axis machine tool inventory, the Ely-based company recognised that it needed to upgrade its CAM software to maximise the capabilities of its investment. That is why the company has invested in the hyperMILL CAM software from OPEN MIND Technologies.

As part of the Shearline Group that operates out of an 8,500 sq/m manufacturing space in Cambridgeshire, Shearline Precision Engineering Ltd adheres to standards such as AS:9100, ISO:9001 and ISO:14001; manufacturing everything from simple to extremely complex components for customers in the aerospace, instrumentation, motorsport, medical, packaging, power generation and printing industries. It is the complex production tasks on its 5-axis investments that have led the manufacturer to OPEN MIND Technologies.

Simon Cooper from Shearline Precision Engineering Ltd explains: "One of the key reasons that triggered us into getting the hyperMILL software from OPEN MIND Technologies is that we were already using a relatively successful CADCAM package, but when it came to the top end, jobs that required 3D scanning and simultaneous machining on our latest 10-pallet Matsuura MX-330, the current system had its limitations. So, after a fair bit of research, we concluded that hyperMILL fulfilled our needs better than any other system."

The company that was founded in 1973 bought hyperMILL at the end of 2020 and the package is already making an impact. Simon Cooper continues: "The cycle times and setup times are decreasing, especially as we always have our programming suites right next to the machines. We use our same top-end guys that do all the programming, setting and methodology of fixturing as well as running the machines. As the guys are all next to each other, all programming and fixturing can be done very quickly without having to go back to an office or acting as a liaison between people to undertake the tasks. As all the team see the projects through from start to finish, they are more invested in each job. This means that we always tend to get a better quality of product and a better understanding of how each part is being machined."

Shearline cell leader and programmer Tom Biscoe says: "We have done a couple of jobs with hyperMILL and the difference shows. It just makes you quicker at doing everything. It is so much simpler to use and a lot of the features are something that we didn't have in our old software.

"One of the big features that hyperMILL has that our existing software doesn't, is the machine simulation. This undertakes the collision checking and also gives you a nice visual representation of how everything is going on the machine. This puts our mind at ease when we are watching something through, especially on 5-axis jobs that you know are going to be tight. If you see all of your holders and fixtures on the simulation and you know that nothing has gone wrong during simulation, it is down to us to ensure that nothing goes wrong on the machine.

"Having the ability to work off a single datum point, an impressive tool library and tool path flexibility has reduced programming times by 30 percent compared to our previous system. However, as we do a lot of batch work from 50 to 150-off that is often repeat orders, we will benefit from the programming efficiency going forward more than at present."

One feature of hyperMILL that has impressed Shearline during the programming process is the tool library. Tom Briscoe says: "We did have a tool library on our old software, but because it wasn't very good, nobody used it. With hyperMILL, the tool library is very helpful, especially with the fact that we have three machine tools with very large tool capacities. This means that we can use the same tool and spread it across all three machines and all of the functions remain and you can apply all sorts of cutting data to the tools and use that data for different tool paths.

"Another feature is the tolerancing on 3D tool paths. There is a tolerancing function that you can adjust, and this is a massive help to us and as we see more of those

complex parts that first enticed us to purchase the software, we are going to continually see more of those benefits.

"We have reprogrammed some parts with hyperMILL and it is 10 times better than before. The cycle times on the machine are currently around 30 percent faster too. This is because there is no 'air cutting' like with the previous system. With our type of batch production and pallet loaded machines, this 30 percent saving will be significant. We are also witnessing far better surface finishes and tool life too.

"The training was really good considering the circumstances and the situation that we are all in at the minute with COVID. We've had two 3-day sessions so far and we have another one to go, but so far, we have got on very well with hyperMILL. I have been programming on our previous software for over 4 ½ years and I thought the transition was going to be difficult, but it hasn't been. The other person that did the hyperMILL training with me, Harry Clark has only been here two years as an apprentice, so his programming experience is in its infancy, but he picked up the hyperMILL training really well."

Harry Clark comments: "I have been on two 3-day courses, taking in part one and part two of the training. The first part was quite a steep learning curve as it was my first time using the software. By the second session, I had more time and felt more comfortable with the package, as I had a little time between the courses to use the software in a work environment. I am now looking forward to delving deeper into the full capabilities of hyperMILL and seeing what it can do."

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GibbsCAM launches version 2022 with a focus on product quality and core strength

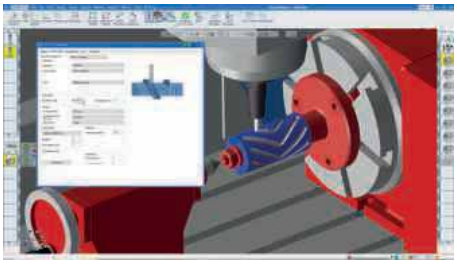
CAMBRIO, a leading CADCAM innovator in the production machining industry, has announced the new release GibbsCAM 2022. GibbsCAM vice president Nick Spurrett says: "The latest developments see further emphasis on end-user productivity in all areas of the product. GibbsCAM continues to lead the industry in the programming of advanced machining centres and we wanted to focus on absolute product quality and core functionality, while retaining GibbsCAM's ease-of-use. Our aim is to always deliver on our promise of Powerfully Simple, Simply Powerful."

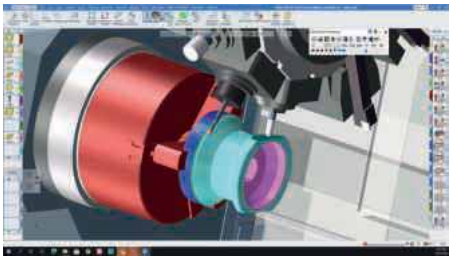
The latest release includes a number of CAD enhancements for solid and surface modelling which include the ability to extrude multiple bodies with taper and to create surfaces as a stitched body directly from closed 2D geometry. In addition, users can automatically create trimmed planar surfaces in any orientation at geometry depth instead of the CS plane. Further developments include new alignment capabilities which allow straight edges of solid bodies to be easily aligned with the working coordinate system in preparation for machining and a new sectional view slicing plane which can be dynamically moved in any direction to easily view and select features within the interior of a solid body.

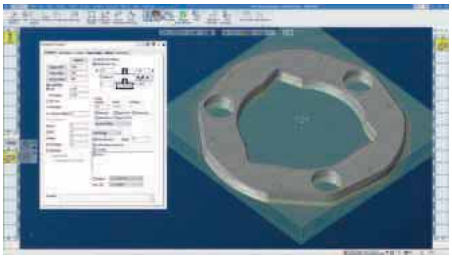
Among the multiple CAM additions within GibbsCAM 2022, a number of usability enhancements have been included, such as automated multi-shape predrilling and extended control for start / end points of profiling toolpaths. It is now possible to omit radius moves on outside corners of turning operations which makes it easier for lathe operators to adjust critical diameters and reduce output size of G-code files.

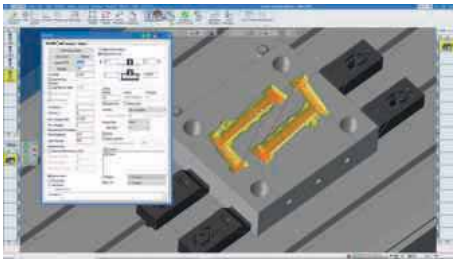
VoluMill has been improved and delivers significant time savings of up to 60 percent on calculating rest milling operations on complex geometry. In addition, you can now also control the preferred starting zone for symmetrical cuts to aid chip evacuation and reduce rapid movements for deeper pockets.

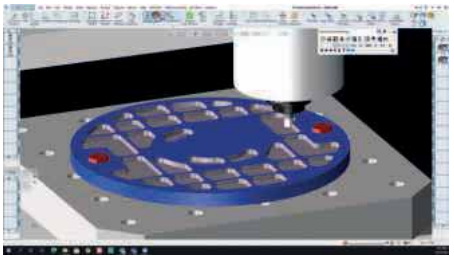
5-axis enhancements include a new rotary machining strategy to cut parts with cylindrical or conical floors such as feed screws or augers. Advanced control of the tool includes off-centreline roughing and front or back engagement of the tool point with automatic corner offset. New 5-axis deburring enhancements include the ability to generate multiple cuts to approximate a chamfer or fillet on an edge beyond traditional edge breaks. It is also possible to use cylindrical or conical tools for chamfering by selecting a specific contact point to keep a straight tool section. Toolpath quality is also improved for 5-axis Geodesic operations in areas where multiple surface normal instances control the toolpath. Other 5-axis updates include automatic tilting for collision avoidance for arc leads, the ability to select automatic tilt limits or set a fixed tilt angle relative to a selected surface normal.











In a collision rich environment such as mill/turn or tombstone machining, simulation is a key component. GibbsCAM 2022 introduces a number of time-saving enhancements which include the ability to hide multipart cutting in all simulation modes in order to significantly reduce the verification time based on the number of components being machined. The use of 3D material only stock generation on multi-spindle machines can decrease the simulation time of MTM configurations by up to 25 times. Additionally, a brand-new feature allows the user to start simulation part way through a multi-flow MTM or Swiss program.

Lastly, machine support has been significantly improved to include the ability to support multiple kinematic configurations of a CNC machine within a single post package. This provides extended flexibility to support machines that can be configured in multiple ways, such as a 3-axis machine with or without a removable rotary table. This technology can also be extended to more complex Swiss configurations to support different parts or tooling arrangements. One part, one post, one MDD, one machine simulation model.

Nick Spurrett concludes: "GibbsCAM 2022 provides additional milling and turning capabilities and extends machine simulation functionality for our customers. This improvement in communication between software and CNC machining centres will help drive productivity while reducing machining time."

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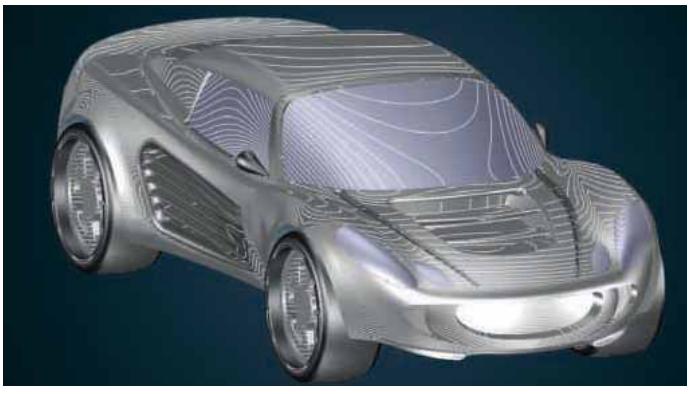
High quality surface finish at top speed with Tebis CADCAM

Milled high quality surface finish is a frequent requirement in the manufacturing sector. With Tebis CADCAM, high quality surface finish is one of the key benefits.

Tebis maintains a strong emphasis on machining surface finish quality with a few key technologies, such as machining on true surface CAD model, user controllable point distribution, support for full forms of tool geometry, advanced machining toolpath strategies, as well as utilising automated surfaces. All of these technologies help to produce consistent high accuracy and high-quality surface finish.



Many other CAM systems on the market calculate toolpaths on triangulated mesh even for imported CAD data with surface or solid models. Tebis CADCAM software offers the capability to calculate toolpaths on true surface CAD model which ensures high machining accuracy and surface finish.

With Tebis, it is possible for the user to control the point distribution within toolpaths across a 3D machined area. This is very important when machining against fine details or precise features within a surface area. This can be easily achieved with Tebis by the user within programming operations.

Point distribution options allow a more detailed calculation of toolpath to emphasise feature edges on part surface data. Tebis software also has specialist functions to analyse topological and geometrical defects, highly segmented surfaces and unnecessary surface patches.

Precise tool geometry support and advanced tooling library is the ability to predefine cutting conditions such as, speeds, feeds, cutting widths and cutting depths with the actual tool geometry. These can be referenced against specific machines, materials and operation types to create the most consistent and optimised tool cutting conditions no matter who, what or how you are programming. Tebis is also capable of programming using circle segment tooling which gives time savings and potential improvements in surface finish.

Tebis reverse engineering quickly generates virtual twins of real forming and injection moulding dies. Existing CAD data can also be considered. In many cases, reverse engineering is an extremely useful tool.

Watch the video to find our more:
https://www.youtube.com/watch?v=-jRqpyAtWdI&t=7s

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VERICUT V9.2 users get quicker, faster, better across the board

The three VUE 2021 (VERICUT Users' Exchange) events held during September 2021 attracted over 60 people from the UK's leading advanced manufacturing and technology companies. The events kicked-off at the British Motor Museum in Gaydon, followed by Aerospace Bristol and culminating at the impressive Nikken Innovation Centre Europe in Rotherham. The technical staff from CGTech used the event to provide customers with a feature review of the enhancements made in the latest release of VERICUT, Version 9.2.

Attendees were welcomed by Gavin Powell, CGTech UK's technical director. He highlighted the fact that VERICUT remains the world's most advanced independent CNC machine tool simulation and optimisation software: "With the major features of this new release, VERICUT offers its users even more protection and opportunities for productivity and efficiency gains. Version 9.2 includes Collision and performance improvements; new 'Graphs' and 'Tool Use' windows that provide visual data in an easy-to-use format; enhanced support for hole making tools; annotation and section for cutting tools; new cutter types; user driven changes to improve multi tool stations; FORCE and Additive enhancements."

Collision and performance improvements of V9.2 were demonstrated with material removal at tight cutting resolutions carried out up to 30 percent faster. Deep concave collision penetration has been enhanced, especially against high triangle count models and an impressive example of an impeller case highlighted just how quick this latest version of the software is, reducing the time required from 12 minutes in V9.1 to just 36 seconds.

Regarding hole making, the CGTech technical team asked: 'What could possible go wrong?' Very little, with the support of VERICUT Version 9.2, as the software now checks for wrong location, size or depth; cut deeper than flutes; motion not along tool axis; pre-drill operation before ream or tap and incorrect feeds/speeds for tap.

New cutting tools supported include spherical end mills, known as lollipop or balloon cutters, and thread milling tools. While the multi tool station enhancements are aimed at users of Swiss-type sliding headstock lathes where multiple tools are located on patterns. Here, there is more collision information provided for individual tools or sub-assemblies.

"With VERICUT at the core of the business any company can have vastly improved interdepartmental connectivity," Gavin Powell stated. "The machine shop, tool setters, inspection department and estimating can enjoy access to accurate business data."

The new Assembly Manager in V9.2 allows users to manage assemblies in a library, making complex ancillary equipment such as rotary tables; robot end effectors; head attachments and workholding fixture assemblies and clamps and bolts easier to control as they can be shared on other machines or even different projects.

Steve Shotbolt, international sales engineer, presented Force enhancements and success stories highlighting how time, machine and cutting tool savings all added up to provide substantial business benefits. He explained: "The fundamental problem we are solving with VERICUT Force optimisation is that CAM systems focus on feed rate and not chip thickness. The sequence for optimal cutting is to maximise the chip thickness matched to the tool, keep the chip thickness consistent and avoid excesses.

"There are a number of key elements that make Force even better in the latest version of VERICUT, including using the cutting tools Max Deflection as a limit, building on the previous limits of chip thickness, force applied to the cutter and spindle power. The Force Material Catalogue Data can now filter by material ISO code, or characteristics. It can adjust turning operations for interrupted cuts and a powerful 'Learn From Results' function allows users to 'Save As' for optimisation settings."

For VERICUT users that were unable to attend the live events, CGTech has scheduled a virtual event on the 17th & 18th November.

To register for the event, visit: https://www.cgtech.co.uk/company/vue.html

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Hexagon software helps contract manufacturers win projects

New manufacturing project management software advances from Hexagon's Manufacturing Intelligence division enable sheet metal fabricators to connect data from planning, quoting, and manufacturing systems to improve decision making and productivity. By connecting with Computer-Aided Manufacturing (CAM) systems, the software helps production shops to automate planning and production processes, from determining material usage and production time estimation to optimising processes and sheet-metal nesting strategies, from a single dashboard.

Managing inventory to meet just-in-time material requirements can be an intricate balancing act as production teams strive to quickly secure and complete new projects. Hexagon's manufacturing project management software, WORKPLAN, now eliminates manual data entry by making it possible to repurpose existing job-quotation data to rapidly begin projects and provide an overview of job requirements so production teams can track projects throughout planning and production. Its centralised inventory database oversees supply needs, simplifying the management of materials and supplier information and enables users to conveniently order materials directly from the system's interface.

Connecting the manufacturing project management system with CAM solutions enables manufacturers to quickly analyse production needs and manage downstream activities by eliminating manual data entry and capturing valuable proprietary information. For sheet metal fabrication, WORKPLAN now connects directly to Hexagon's RADAN CAM software so that comprehensive material data, including sheet sizes, current pricing and product codes, can be added to WORKPLAN's inventory and used for job quotations. These more accurate job quotes can include production data used by the system to determine material needs, as well as the time per part and the total time that each project requires.

''Manufacturers need flexible and connected manufacturing project management tools that can be easily tailored to fulfil their distinct needs," says market and product manager Christophe Mas. "Manufacturing project management software plays an essential role on the shop floor, but when you connect it with CAM software, users gain greater agility in both day-to-day management and in responding to unforeseen challenges. In uncertain times, putting planning, quotation and production data to better use quickly translates to more competitive speed and efficiency."

Tapping into Hexagon's specialist sheet metal solution, WORKPLAN can now manage coils of material as it does other material types, including the option to reserve quantities of material for specific jobs. As the software automatically maintains a current record of inventory, jobs are flagged for follow-up if there is not enough material in stock to complete a project. Because users can simply cut the size of material that they need from the coil, the system's ability to process coil usage reduces the number of material types that need to be digitally stored and managed.

Furthermore, users can now track the progress of nests from the shop floor using barcode scanners that reduce the risk of selecting incorrect projects when working with multiple nests on the shop floor. Using a touchscreen station located in the production department, a manual barcode scanner can be used to scan the barcode on the operator's printed instruction sheet to view the status of a corresponding nest in progress displayed on the touchscreen.

Mould and die shops also benefit from improved connectivity with CAD. WORKPLAN software can now also import a bill of materials (BOM) from Hexagon's VISI solution, automatically updating the information as designs progress within the WORKPLAN dashboard.

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Linn makes 'sound' investment in quality with Mitutoyo

Globally renowned as a leading designer and manufacturer of high-fidelity sound systems, such as turntables, streaming systems, amps and speakers, Linn Products employs approximately 160 people at the company's impressive Glasgow based HQ. Rather than pursue a business model of planned obsolescence, due to the modular nature of Linn Products' hardware and software, all of the company's systems are upgradeable. In addition to their ability to evolve, the enduring quality and longevity of the company's systems, ensures the best sound possible for the lifetime of each product.

Quality permeates every aspect of the business' activities. To ensure the build-quality of Linn Products' celebrated products and to guarantee their outstanding sound reproduction and clarity, in addition to long lasting performance, the company's staff perform painstaking inspection routines throughout all stages of manufacture.

To reduce the company reliance on subcontractors, further increase the autonomous nature of the business' manufacturing operation and to provide even greater control over the quality of its components, Linn Products recently made several investments in advanced machine tools.

These investments included the purchase of a bespoke manufacturing cell from Mills CNC. The fully automated system includes a Doosan DVF 5000 5-axis machine tool and a Fanuc industrial 6-axis robot. The impressive new cell now runs unattended overnight and over weekends and has provided significant productivity gains.

Due to the enhanced accuracy capabilities and the high-yield nature of Linn Products' new manufacturing plant, Chris O'Brien, Linn's director of operations, searched for an advanced Coordinate Measuring Machine (CMM) that had the ability to keep pace with the company's increased production of precise components. Following a successful, practical demonstration at Mitutoyo's East Kilbride showroom, an order was placed for a recently launched CRYSTA-Apex S Series CNC CMM.

Explaining Linn Products passionate quality philosophy and the purchase of the CRYSTA-Apex S Series CMM, Chris O'Brien says: "Ever since Linn Products was established in 1973, we have constantly pushed technology forwards in the pursuit of perfect sound. From our very first product, the iconic Sondek LP12 turntable, we have been at the forefront of audio technology.

"All of our high-fidelity sound systems are assembled by hand in our Glasgow factory, and each one bears the name of the person who made it. Our systems are engineered to extraordinarily tight tolerances. To help ensure the continuing premium quality of our products and to guarantee their prolonged superior performance, all systems are painstakingly inspected and tested at each stage of manufacture. Then, prior to despatch, every product is thoroughly tested to ensure that they deliver outstanding performance.

After bringing the machining of many of our previously subcontracted, high-precision components in-house, we needed to source a highly efficient and very accurate means of inspecting them. Having considered other options, a demonstration of a CRYSTA-Apex S Series machine at our local Mitutoyo showroom proved that it was the ideal advanced CMM for our demanding needs. As it had the ideal to size to accommodate our components, we ordered a Crysta-Apex S544 model with an x,y,z, capacity 500 mm x 400 mm x 400 mm.

"Following our new Mitutoyo CMM's trouble free installation our engineering staff were trained in its operation. As the CMM's operating system and software are so logical and intuitive our staff soon became able to perform a range of inspection routines. Although, when needed, they are able to receive help over the telephone from Mitutoyo's technical staff. Our CRYSTA-Apex S Series machine is now making a significant contribution to Linn Products quality management systems."

Mitutoyo CMMs are available in a wide range of sizes and accuracy classes enabling them to cover practically all precision 3D measuring applications. A large variety of contact and non-contact probes are offered, enabling a wide range of different measurement routines to be performed. Complementing Mitutoyo's celebrated CMM hardware, the company's powerful, yet easy-to-use analysis software allows all measurement results to be interpreted in the timely manner so essential for keeping pace with today's fast-paced production speeds.

The CRYSTA-Apex S series are high-accuracy CNC CMMs that guarantee a maximum permissible length measurement error of E0,MPE=(1.7+3L/1000) µm [500/700/900 Series]. In addition, the CMMs deliver a maximum drive speed of 519 mm/s and a maximum acceleration of 2,309 mm/s2, resulting in an increase of almost 100 mm in drive distance in one second, when compared with general-purpose CNC CMMs.

Designed to deliver high rigidity, Mitutoyo's Crysta-Apex S series CMMs feature unyielding structures. Their Y-axis guide rails, which are attached to one side of the machines' granite surface plates, helps them to maintain high levels of accuracy over years of use. The CMMs' air bearings are located on their guide rails' bottom faces, also on the front, rear, and upper surfaces of the slider unit of the X-axis. This arrangement helps to minimise vibration even during high-speed, high-acceleration movements and ensures stable linear motion. The high speed and high acceleration qualities of CRYSTA-Apex S CMMs dramatically reduces measuring times.

In addition to being an ideal CMM for use in pristine quality departments, thanks to the use of a temperature compensation system, CRYSTA-Apex S CMMs are able to guarantee the accuracy of measurement under temperature conditions of 16 to 26 °C. Mitutoyo's ingenious temperature compensation system is based on permanently installed temperature sensors located on each scale working together with sensors placed on the workpiece.

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Advancing inspection processes through innovative equipment

As a leader in the development and manufacture of commercial fire alarm and detection systems, it is critical that Advanced invest in capital equipment to enhance production. To ensure it continuously uses the most-advanced technology and systems, the company recently invested in new equipment from Altus Group.

Following the research of Advanced and its production requirements, Altus recommended Koh Young 3D AOI inspection systems that incorporates KSMART a measurement-based process analysis solution which allows manufacturers to implement Industry 4.0 with reliable full 3D measurement data.

The use of 3D AOI systems are an important method of inspection as measurement accuracy is increasingly fundamental. As the components used in modern electronic assembles become smaller, the need to offer reliable and traceable processes for critical applications like those used within Advanced's fire systems become even more critical.

"Implementing the most reliable and accurate inspection processes is of the utmost important to us because our products are safety critical and can be lifesaving if called into action," says Steve Gee, engineering manager from Advanced.

"It is vital during production that we have zero escapes. We must also not compromise on false calls for our operators. Through our evaluation, we saw that the Koh Young platform, which uses full 3D light measurement instead of optical 2D AOIs, would create that peace of mind of no escapes while also delivering very low false calls.

"Aside from the support and known reputation of Koh Young and

Altus, what was also significant in our decision making was how the Koh Young platform unlocks the data the AOI collects."

Koh Young's 3D AOI solutions intelligently combine technologies with superior hardware to ensure inspection tolerances are precise, providing meaningful insights about the process and eliminating the root causes of a defect through measurement data generated from 3D AOIs.

Tony Sweetman, Altus sales manager says: "The Advanced team were ideal to work with and are a customer that quickly understood the differences between full 3D measurement and the other offerings on the market using legacy technology.

"Certainly, we had to prove our capabilities and show them how the system could add value, but it was great to support a new knowledgeable company. We are looking forward to working on more projects with Advanced in the future and building on this new relationship."

Altus Group Ltd Tel: 01386 791074 www.altusgroup.co.uk

Choice of technology for growth

Global Steel Manufacturing Ltd is a family-owned business based in Enniscorthy County Wexford, Ireland. The business has been in operation for over 30 years. The founder of the business, Jim O Connor, still plays a hands-on role with his management team in running the business.

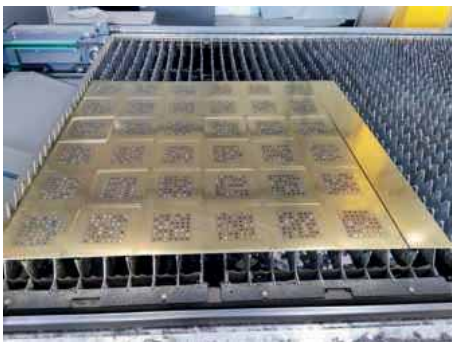
Global Steel's services include fibre laser cutting, waterjet cutting, plasma cutting, stainless and mild steel fabrication and CNC press break folding. Operating from a new, purpose-built premises on the outskirts of Enniscorthy town and fitted out with modern fabrication and machine shop equipment, the company has forty full time employees. Global Steel offers a wide range of specialised engineering products and services to all sections of industry, particularly food processing, pharmaceutical, telecommunications and related sectors.

Plans are in place to grow the business by double digits year on year, 2020 saw the turnover reach 3 million Euros. The company is experiencing rapid growth and is now recruiting new staff as part of its 5-year plan to grow the business.

Global Steel's business model is based on quality of product, JIT delivery and a repeatable service experience. A Bystronic BySmart 3 kW fibre laser cutting machine was purchased in 2020 through sales manager Sean Larkin, to satisfy the needs of its customers. It was the first of its type in Ireland. To match the new increased capacity, another press brake folding machine was also ordered from Bystronic which has a 4-metre fold capacity.

In June 2021, the company placed an order for a second Bystronic fibre laser machine. This 4 kW machine will significantly increase the company's ability to penetrate the contract cutting and folding market.

Bystronic was selected as being a



top-quality supplier of lasers and press brakes equipment with a knowledgeable and prompt support service team. The BySmart Fiber offers outstanding cutting performance for high parts output and excellent cutting quality with thin to medium sheet metal thicknesses.

Installation of the new Bystronic laser took place in March 2020 and in August, Kevin Power was appointed business development manager. He has particular expertise in the development of laser cutting, fabrication and assembly of high precision steel components for engineering, civil engineering, construction, pharmaceuticals, and chemical industries.

Why laser?

The introduction of the fibre laser machine presented a technical solution in the expansion of the business, particularly in the context of a shortage of qualified welders. The company is currently re-organising to expand laser run time by introducing shift pattern in its laser department. These plans for additional shifts will significantly increase capacity to service the downstream capabilities of the business.

Led by production manager Paul Cullen, training was provided to a group of highly motivated individuals who have been cross trained on the key requirements of this department, namely drawing, laser machine operation and folding.

More space and more capacity

A significant new factory extension has been completed to provide the additional floor space necessary to prepare for growth. This space enables a re-organised layout to cater for the laser machine, the relocation of the fabrication shops and the creation of a material storage area. The layout achieves a seamless flow of material and product consistent with the lean fundamental of minimising transport time within the

process. In addition, Global Steel is currently pursuing a site for the expansion necessary to fulfil the plan in two to three years time.

Global Steel enhanced capabilities are targeted to better meet the needs of its existing customers as well as increase its customer base. Hugh O Byrne, general manager, says the expansion will focus on laser cutting and folding while also providing a complementary services for fabrication and powder coating/painting where required.

In the waterjet area, the company has the ability to cut heavier/specialised materials up to 150 mm and will target customers with these specific needs.

In fabrication, the company plans to primarily target customers requiring fabrication who have repeat products which the company believes will lend itself to automation where this is possible.

Global Steel Manufacturing Ltd is confident of future growth and looks forward to presenting its capabilities to existing and new customers in the years ahead.

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Nukon appoints Ingenium Integration for its advanced fibre laser cutting systems

Ingenium Integration Ltd, the sister company of UK-based tube bending machinery specialists Unison Ltd, has been appointed as the exclusive UK and Ireland distributor for Nukon's 2D fibre laser, 3D fibre laser and fibre laser tube cutting machines.

"For quite some time we have been looking at extending our product range to include high quality laser cutting technologies, particularly as we believe they would be of significant interest to owners of tube bending machines from Unison and other manufacturers," comments Ingenium Integration sales manager, Steve Haddrell. "Short of building our own laser cutting machines in-house, our challenge was to find an established product range that mirrored the uncompromising levels of accuracy, reliability, build quality and support that are synonymous with the Unison name.

"Having researched the marketplace extensively, we believe we have found such a product range from Nukon. Companies buying a Nukon fibre laser cutting system from Ingenium Integration will receive the same high standards of service and aftersales support as if they had bought a British-built Unison tube bending machine. We are also available to assist any UK or Irish businesses that already own Nukon laser machines."

The Nukon fibre laser range includes 2D, 3D and laser tube cutting machines. High-spec standard features include: nLIGHT fibre lasers with adaptive beam optimisation and Lantek Expert software, which is one of the most advanced CADCAM nesting software packages on the market today. Nukon's 2D fibre laser machines include models designed for

first-time laser users and businesses adding value to in-house manufactured products, as well as high-performance machines for demanding flat-bed laser metal cutting requirements in subcontract environments.

The Nukon range of 3D, 5-axis machines has been developed for the most challenging of applications, such as precision-cutting tubes, pipes and intricate profiles in a wide variety of materials, as well as R&D work. While Nukon laser tube cutting machines include pipe and profile cutting models, as well as 'Vento Flex', a highly versatile machine able to cut tubes, pipes, profiles and flat metal sheet.

To assist customers in maximising the productivity and efficiency of their laser-cutting operations, Ingenium Integration also offers Nukon's range of fully automated loading and unloading solutions. These include highly space-efficient compact lift solutions with vacuum loading and 'finger-lift' unloading, 'Expert' models that are able to feed multiple laser cutting machines simultaneously and easily extended modular tower systems with the added benefit of component storage.

The appointment of Ingenium Integration as the exclusive UK and Ireland distributor for Nukon's fibre laser machines follows on from the recent launch of a brand-new range of hybrid tube bending machines from tube bending machinery specialists, Unison Ltd. Called Synergy HBM, hybrid, multi-stack, these new machines are available in 50 mm and 80 mm, maximum tube diameter, versions and have been developed to provide a lower cost entry point for businesses with tube bending requirements that do not typically demand the high levels of flexibility and rapid setup associated with Unison's leading all-electric 'Breeze' tube bending machines.

The automation arm of the Unison family of companies, Ingenium Integration Ltd creates the automation solutions that help manufacturing businesses of all sizes improve productivity and quality and save both time and money. Working in highly regulated sectors, such as aerospace, automotive, food & beverage, nuclear, shipbuilding and oil & gas, Ingenium Integration streamlines production to enable leaner manufacturing. Depending on customer requirement, the company's fully automated work cells can include precise tube bending solutions from Unison Ltd, laser cutting technologies from Nukon, sophisticated jigs and fixtures, remote handling, robotised cells with transfer systems, tooling verification with remote diagnostics and automated flow lines. Helping customers fully benefit from the Industrial Internet of Things, Ingenium Integration develops effective Industry 4.0 strategies, supported by rich data analysis to improve efficiency, productivity and quality.

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Oxfordshire Covid recovery grant facilitates new laser process at ES Precision Ltd

Like most businesses, ES Precision has suffered from the fall in business activity in 2020-21. ES uses its range of galvo-deflected lasers to provide a laser processing service to medical device, automotive, electronics and other engineering companies. Many of its key sectors were hit hard by the pandemic as there were fewer scheduled operations in the NHS and car plants temporarily closed assembly lines.

ES had been contemplating an expansion of its current laser marking-dominated service to include subcontract erosion cutting but hesitated to do so owing to economic uncertainties and reduced capital available as a consequence of business being hit by the pandemic.

Erosion cutting is a promising application for medium power fibre lasers. It harnesses the flexibility of familiar galvo-driven laser marking systems and meets a demand for precise cutting of thin materials that most commercial flat-bed laser cutters cannot. Such large, expensive CO_2 or fibre-based machines with high pressure gas nozzles are not well suited to producing fine features and small profiles in metal sheets which are of order of 1 mm thickness.

The idea is to present a service for profiling, drilling and perforating thin gauge materials, mainly any type of metal, up to about 2 mm thick, to high technology manufacturing in Oxfordshire and across the UK and Ireland. Aside from the core sectors mentioned above, the company has interest from motorsport, solar energy, sensor/lab-on-a-chip manufacturers, fuel cell development, instrumentation and aerospace.

Integral to ES's plans to laser cut structures with great accuracy is a need to precisely measure what has been achieved. This requires investment in an optical measurement system to provide QA and reports for customers in addition to the laser cutting workstation.

ES presented its business plans and the impact on Oxfordshire economy in its grant application and the OxLEP committee saw the benefits of funding the project via the government's Getting Building Fund, which targets capital investment projects which can take part in a much-needed renewal phase for the economy. ES Precision will take delivery of the erosion cutter and measurement system in the autumn and then launch the service towards the end of 2021.

A precision exposure mask created by erosion cutting

For more information on industrial laser processing, visit: **www.esprecision.co.uk**

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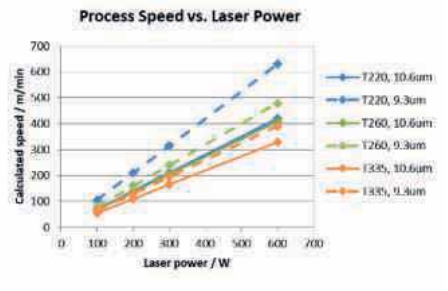
The manufacturing and application challenges of wavelength band-selected CO_2 lasers

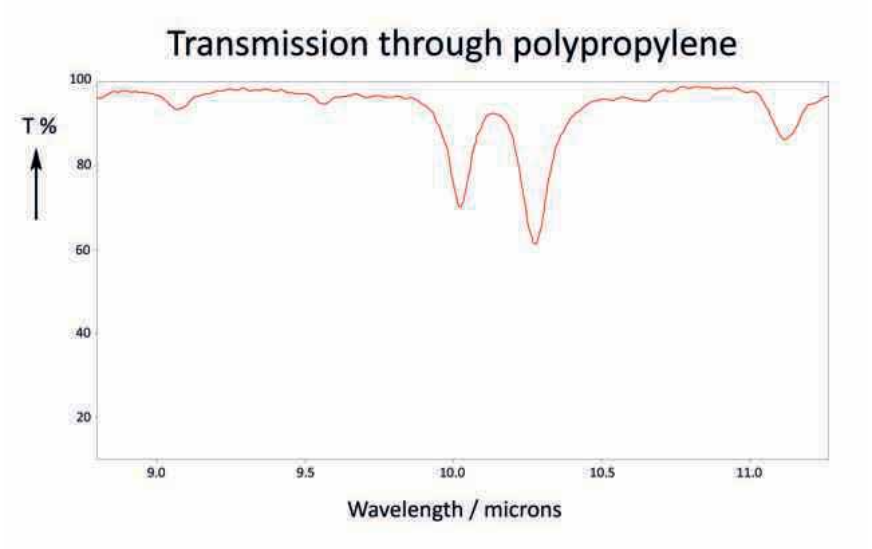
The need for wavelength selection

Both speed and Heat Affected Zone (HAZ) can determine the choice of wavelength for certain materials that can only be machined using band selection optics. In thin films that are less than or equal to 100 µm, speed can be greatly enhanced using the correct wavelength. In substrates that are greater than or equal to 250 µm, HAZ is the determining factor in choosing to move from a 10.6 µm operation.

dielectric mirrors can depolarise circular polarised light whereas isolation mirror solutions are lambda specific. At 9.3 µm, especially at high powers, lens effects due to absorption distort the beam; these can be removed by nitrogen purging or by moving dry air. Loss per surface on standard 10.6 µm AR or AR transmissive optics is approximately 3-5 percent at 9.3 µm operation and can cause back reflections or heating of optic mounts. Loss on standard 10.6 µm dielectric folding mirrors is not generally an issue.



Paper cutting using OEM series 9.3 µm CO_2 laser



Transmission through polypropylene

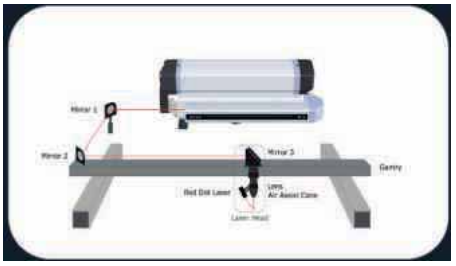
Band selection method in 80-450W rated Luxinar CO_2 lasers

Isotopic gas fill is used, however there may be issues with this method such as killing out neighbouring branches and the fact that availability and cost of isotopic gas is variable.

Band-selected cavity optics need robust coatings with a high flux density, proximity to RF discharge and the ability to suppress the neighbouring branch without reducing gain at the required wavelength. Niche coating designs can lead to lower yields and longer lead times.

Manufacturing challenges

Polarisation, absorption in air and loss are the main integration challenges for wavelength band-selected CO_2 lasers in a manufacturing setting.Standard 10.6 µm



Integration of wavelength band-selected CO_2 lasers in a manufacturing setting

Application challenges

Luxinar's OEM series and SR series 9.3 µm sealed CO_2 lasers are both ideally suited to these applications. The SR and OEM series provide a higher quality cutting edge compared to standard pulsed CO_2 lasers.

For specific materials, the SR and OEM series give a faster cutting speed at 9.3 µm when compared with standard 10.6 µm lasers.

Summary

Luxinar offers 10.6, 10.25 and 9.3 µm sealed CO_2 laser sources that are 80 to 450W rated for use on materials that can only be machined using band selection optics. Manufacture and characterisation of these optics require collaboration and planning between Luxinar and the optics supplier. The OEM and SR series from Luxinar provide a solution at 9.3 µm however integration can be more involved than at the standard 10.6 µm wavelength.

Luxinar has a singular focus: developing laser technology to enhance our world.Like a laser that channels light into a single, powerful beam, the company's focus is on improving the lives of its customers. This allows it to create solutions to meet every single challenge, from heavy industry to delicate, high precision applications. It supports the laser technologies of yesterday, focus on today's and pioneer those of tomorrow.

It has been at the forefront of laser technology for over 20 years and is a leading manufacturer of sealed carbon dioxide (CO_2) laser sources up to 1,000W and, more recently, femtosecond laser sources. To date, it has an installed base of over 20,000 lasers worldwide in industrial applications environments.

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MSS Nitrogen Inc. agrees partnership deal with Bystronic

MSS Group Ltd is delighted to announce that its US operation, MSS Nitrogen Inc. has reached a partnership agreement with Bystronic Inc for the supply of Nitrocube™ Nitrogen Generation systems and Nitro2 Gas mixing panels into the North American market.

Bystronic Nitrocube and Nitro2 sales in North America will be fully supported by MSS Nitrogen Inc. for all associated installation, training and aftersales operations from its US headquarters in Rockhill, SC.

This agreement represents a significant milestone for MSS Groups global sales achievements and the company is genuinely excited about the further opportunities that this prestigious partnership will bring.

MSS Nitrocube has been specifically designed with laser cutting applications in mind. All systems are carefully specified to provide high pressure Nitrogen at purities of up to 99.999 to suit each customers requirement. It focusses on overall usage combined with close attention to peak demand needs to ensure that the system meets demand with a carefully considered margin for redundancy to allow for additional unforeseen demand if required.

The MSS Nitrocube has many benefits compared with more traditional gas supply methods including potential significant cost savings, carbon footprint reduction and perhaps most significantly the system offers the user the convenience of generating their own Nitrogen only as and when they require it without significant system storage losses.

The MSS Nitro2 system allows the laser user to custom tune N2 & O2 delivery online to optimise edge cutting quality and cutting speed. Tests have proved that Nitro2 system can increase cutting speeds by up to 3x that of single supplies of N2 or O2 without the need for a separate mixing vessel.

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Automated press brake productivity adds value for Teparay

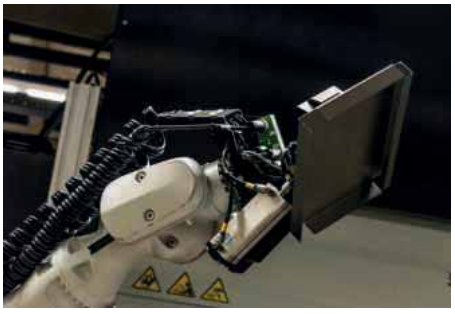
Product development specialist Teparay Precision Sheet Metal (TPSM) has invested in two LVD Dyna-Cell robotic press brake systems as part of its long-term strategy of automation and added value manufacturing.

The Dyna-Cell integrates a 1,500 mm 40-tonne electric press brake with a Kuka robot and a universal gripper system. LVD's intelligent CADMAN-B and CADMAN-SIM software ensures quick and easy offline programming of the complete cell and LVD's Easy-Form® Laser adaptive bending system guarantees the bend angle consistency required for automatic operation.

The first machine was installed in Spring last year with the second following shortly after. Managing director Ray Belcher says TPSM's aim is to solve a customer's problems from the initial idea, through development and prototyping to full production: "What we like is the opportunity to work with someone at the concept stage rather than take on something that has already been fully engineered. Our R & D department is constantly designing and developing new products.

"We try and engineer components so that they can be produced in a very efficient way on our automated equipment. Designing and developing products to suit our machines means we can be very competitive for our customers."

He takes a long-term view on the need to remain relevant and sustainable over the next 15 to 20 years: "Labour costs are increasing, material costs are increasing, so we were looking at the overall strategy of how we can automate the factory more to stay competitive in a more challenging environment."



Bending is one area where automation is critical due to the difficulty of finding skilled people to set up and operate press brakes.

"There is a long-term skills shortage, so there was a need to try and set up and run the machines automatically," Ray Belcher explains.

Having considered several possibilities, he decided on the LVD Dyna-Cell as the right solution. Its tight footprint, ease of programming and suitability for efficient production of small parts, together with LVD's Easy-Form adaptive bending technology were all key factors for the purchase.

Ray Belcher continues: "The bit I absolutely love about the Dyna-Cell is the Easy-Form adaptive bending system. I don't see how you could run an automated machine without that feature."

He says that when you are laser cutting parts you want to get the best possible utilisation of the sheet which means you will be bending parts that have been cut both with the grain and against the grain. And, although the aim is to produce a batch of components from a single batch of material, that isn't always possible so you may end up using sheets from two coils with totally different mechanical properties.

"Anyone who has tried to bend these without the Easy-Form will know that you can end up with a totally different angle," adds Ray Belcher. "We have proven that the Easy-Form takes away that challenge. The bend angle will always be consistent."

The installation of the two Dyna-Cells has allowed TPSM to restructure the way it makes its folded parts, taking the small components off its big press brakes and panel benders to free up capacity and ease workflow.

Ray Belcher states: "We are looking all the time for productivity and efficiency. With our panel benders and stand-alone press brakes we were always restricted on capacity, but the Dyna-Cells have absolutely revolutionised our bending capabilities."

He says that large press brakes are often underutilised producing small components: "What we have done is to take away as many of these small parts as we could from the large manual press brakes and put them on the Dyna-Cells. That frees up the skilled setter/operators. Once they have set up the Dyna-Cell they can go off and bend the larger jobs on another machine."

The flexibility of the Dyna-Cells has become clearer as TPSM has become more used to using them.

Having originally set a minimum batch size of 500, that has now come down to around 100. In all, around 70 different components are run on the cells and changeovers from one part to another take just minutes.

Ease of programming

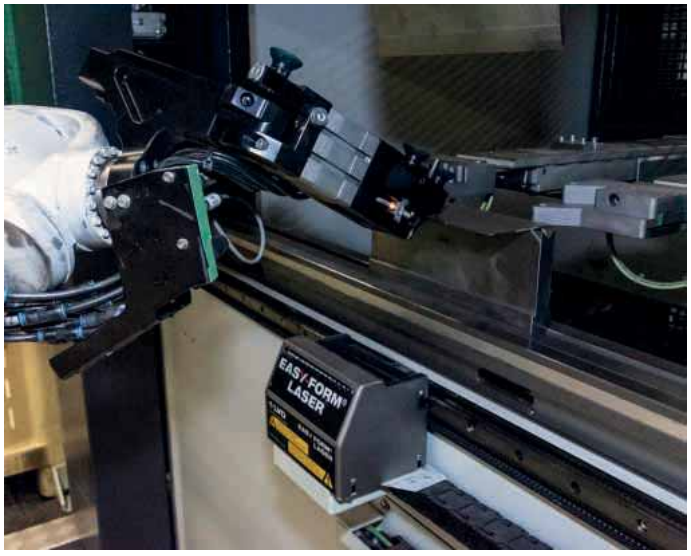
Ray Belcher says that LVD's intelligent programming software, CADMAN-B for the press brake and CADMAN-SIM for the robot, is easy to use and only takes around 10 to 20 minutes to program a typical part: "You upload the 3D model and the software creates the bending program and checks whether it can be bent by the robot using a green, amber and red traffic light system and creates the program for the robot automatically. It is a very quick and efficient process.

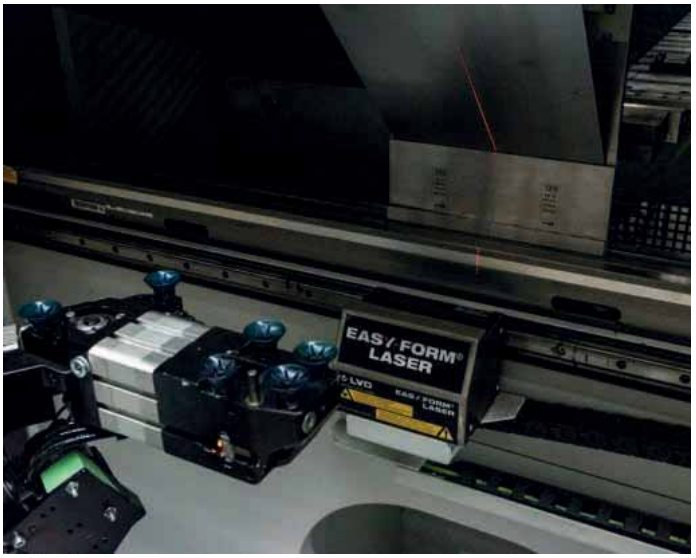
"The robot software is very intelligent. It knows what it can do and what it can't do. You don't have to learn how to program a

robot, it is all in the software. Once you have programmed it you put it on the machine and you are ready to go."

TPSM's designers are constantly pushing the boundaries of what the machine is capable of. This includes creating complex nests and adding holding tags to allow multiple parts to be formed at the same time.

Ray Belcher adds: "We've got some parts where we are bending 20 at a time very quickly. For a bracket with four bends the process time can be as little as ten seconds." He explains that having got the first Dyna-Cell up and running, it didn't take long to decide to add the second machine: "We could see that the first machine was





working really well for us and our drive for automation. And we knew that there would be more and more products that we wanted to put on them.

"Now, with two machines, although the volume of work we are putting through the Dyna-Cells has actually stepped up there is pretty much always capacity available for new contracts where we can add a lot of value on small parts," Ray Belcher concludes.

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Automation and software together to increase press brake productivity

ATA is a proprietary Salvagnini solution, which is unique on the market and makes it possible to automatically adjust the length of the bending tools of the B3 press brake to the part being processed. This automatic tool adjuster makes it possible to make full use of the press brake to produce batch-one or kits without compromising on productivity. We met with Nicola Artuso and Stefano Cera, Salvagnini product managers for bending technologies and software solutions respectively, to speak about this with them.

OEE is the measure of the total efficiency of a system. In traditional press brakes, depending on the production, it can drop to 30 percent because, even in the case of advanced, precise and fast technologies, manual press brakes are limited by factors such as re-tooling and setup times as well as downtimes for sheet metal feeding and part handling and checking. To improve the OEE of the B3 press brakes, Salvagnini has introduced a modular and scalable concept of automation that can increase their flexibility and independence, allowing them to adapt when re-tooling and managing the tools according to production. The aim is to reduce the impact of process variables on bending and to provide greater certainty in terms of machining times, costs and budgets.

"The ATA device makes it possible to automatically change and adjust the length of the bending tools," explains Nicola Artuso. "It is available on many of the models in our range of press brakes and can be configured according to the customer's specific production needs. It can be used only for the upper tools, can be integrated with the MVM, the variable opening die up to 51 mm which automatically adapts the V opening, or can be used on the upper and lower tools. It can also interact with the automatic AU-TO tool changer. Re-tooling is fast, takes place in a few seconds and makes it possible to save time and regain production efficiency. The reaction of the market is truly interesting: ATA is a relatively recent device, introduced in 2016 and which today is a component of 25 percent of the B3s installed."

What does efficiency and productivity mean for bending?

Thinking of a traditional press brake and its normal use, efficiency and productivity are not absolute values, rather they are relative values that must be calculated based on the total process time.

"Let's try to analyse the use of a press brake," continues Nicola Artuso. "Its total process time is the sum of the bending, handling, re-tooling and programming times. The bending time is the time used to make the actual part, whereas the handling, re-tooling and programming times are downtimes during which the machine is on hold. Our analyses indicate variable downtimes of between 30 percent and 60 percent of the total operating time, this is data that our customers and the market tend to confirm. This means that a traditional press brake remains unproductive for between 2.5 and 5 hours a day."

Starting from the assumption that the press brake is a manual technology that does not permit working in masked time, how can we reduce these enormous downtimes?

Nicola Artuso explains: "The bending time is obviously necessary; it depends on the performance of the press brake and the reference standards. I like pointing out that our B3, whose maximum ram descent speed arrives at 250 mm/s, is one of the fastest solutions on the market. The handling time depends on the experience and skills of the operator and we can therefore consider it a constant. So, there are two activities left whose impact we can reduce: re-tooling and programming. This is why ATA devices can be truly crucial as they reduce the downtimes of the press brake, increasing its availability for production. But the best way to substantiate the benefits ensured by ATA is to analyse an actual case. A few months ago, I received a production report from a customer, a large European subcontractor

whose machine inventory includes numerous traditional press brakes from different manufacturers and two Salvagnini B3s featuring the ATA tool adjuster for the upper tools and the variable V die MVM. This report compares the performance of machines with similar measurements and tonnage and the data is interesting. The B3 has average productivity that is approximately 50 percent higher than traditional press brakes, even though the customer admits that it is dedicated to producing small batches that require constant re-tooling."

Parallel programming with STREAMFORMER

In general, we can start from the assumption that, in the press brake market, offline software is not very common. If for 2D technologies, such as laser, the ratio between machines and software is practically 1 to 1, in the world of traditional press brakes, it is more realistic to consider a much higher proportion because the press brake is a manual machine, able to work even without software, but also because an expert operator is generally able to make the required parts.

"In reality, we are noticing a clear trend reversal in the world of 3D programming," says Stefano Cera. "An increasing number of customers are purchasing our CAM software STREAMFORMER, also to face the increasing difficulty of finding expert operators. Today, 65 percent of our B3s, and practically 100 percent of the press brakes with ATA automation, are supplied with STREAMFORMER.''

''STREAMFORMER integrates the press brake in a complete process because it is part of STREAM, the totally integrated programming suite for Salvagnini systems. When STREAMFORMER is installed in the office, it makes it possible to perform activities in parallel, because while one technician is working on the programs, the operator can continue to bend which also reduces to zero the impact of the programming time on the production efficiency of the press brake. Our main objective and I think this is also our customers' objective, is to make the press brake produce as much as possible and not see it waiting to be programmed. In addition to automatically creating a bending sequence, STREAMFORMER automatically defines the bending stations and tool setups; in other words, it integrates perfectly with the ATA devices and enhances their performance. When the software is not available, programming can be carried out directly on the machine, using the FACE man-machine interface, which not only permits numerical programming but also graphical programming with PRESSTUDIO," Stefano Cera concludes.

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Sustainable heating with Biomass

Guntamatic manufactures boiler using premium welding technology from Fronius

Guntamatic GmbH operates internationally producing high-tech biomass heating systems. From fully automatic log wood heating systems through to pellet heating, Guntamatic continually demonstrates its capabilities as a leader in innovation in its industry. The company has always used Fronius welding technology to ensure the high-quality production of its products. Since 2020, the Austrian family-run company has also put its trust in the Fronius TransSteel 4000 Pulse to improve overall manual welding efficiency in production.

The small family-run company Guntamatic, from rural Peuerbach, started trading in 1963 with the production of log wood boilers and has since become an international industry pioneer in biomass heating. Biomass technology really began to boom in the 1980s and Guntamatic began to expand and see its first competitors emerge. In the 1990s, it was becoming clearer and clearer that biomass heating systems could be operated as a fully-fledged alternative to oil and gas heating systems since they were CO_2-neutral.

Guntamatic's hybrid heating systems combine the best of both worlds: the perfect combination of heat generation by means of an electric heat pump for heating water and biomass combustion. This means the system can constantly take advantage of stored prices for electricity and wood/pellets. Also, taking into account personal preferences, hybrid heating systems automatically switch between electric power and biomass combustion.

However, Guntamatic systems do not just set new standards in heating, but also in overall comfort. Heat generation is no longer the only way that Guntamatic succeeds in increasing comfort at home. Atmospheric and elegantly-designed heating elements in the fireplace bring the combustion process and the resulting cozy, radiant heat into the living room.

Sustainability, cost-effectiveness and efficiency

"With the rise of pellet heating systems, the industry has continued to develop strongly since the beginning of the 2000s," explains Günther Huemer, managing director of Guntamatic GmbH. The SME, which, in the meantime, has grown to employ around 250 people, has continued to grow in line with industry trends, something that has also had an impact on production.

He continues: "We have to remain efficient in all areas, while continuing to deliver the highest levels of quality. A high degree of automation, particularly in sheet metal forming, is thus required to continue to remain competitive at our headquarters against companies in low-wage countries."

However, Guntamatic does not pursue cost-effectiveness at the expense of sustainability. "The production of our heating systems focuses on durability," argues Günther Huemer. "We try to produce sustainable, clean, and reliable products. Our ecological footprint is extremely important to us and this sustainability, as well as quality, is something we also demand from our business partners. The long service life and quality of purchased products and raw goods is thus of the utmost importance to us."

In this respect, the company also relies on

close and trusting relationships with its suppliers. "We almost never switch our business partners," Günther Huemer continues. "We place great importance on good, fast and reliable support. As such, one of our partners is Fronius, which has guided us from the very beginning in the field of manual welding."

Production and joining technology

"Almost all of Guntamatic's products are made in Peuerbach," explains master metalworker Roland Fellinger, who is responsible for coordinating welding operations at Guntamatic. "The only things to be supplied to us are the sheets and raw materials. Processing, parts production and assembly are almost entirely completed in-house. We try to avoid purchasing parts."

All components are manufactured using CNC punching machines and other automated high-tech machines before being handed over for joining. Welding boilers and their long seams are completed almost entirely by machine.

However, when it comes to the inner workings and tacking of the boiler, robotic welding is no longer the most efficient option due to the restricted component accessibility. Manual welding thus remains the method of choice: "Here, we primarily add black and white connections, i.e. steel with stainless steel," adds Roland Fellinger. "The box-shaped boilers have difficult corner joints that have to be constantly refinished by manual welders."

"In addition, we are working with the complete range of sheet thicknesses. We predominantly switch between transition

and spray arc, so the choice of materials make the conditions really difficult." In the past, this meant high levels of refinishing were required.

Guntamatic modernises the manual welding sector

"As such, our main goal was to reduce the resulting refinishing costs," confirms Roland Fellinger. Indeed, from the very beginning, Guntamatic has been working exclusively with Fronius welding systems for manual welding, including the VarioSynergic, 3500/4000, the TransPocket, and the MagicWave for TIG welding, but, to cope with the demands for making work easier and reducing costs, MIG/MAG pulse welding seemed the most up-to-date and effective solution.

Roland Fellinger continues: "After Fronius launched the TransSteel Pulse series in 2020, we decided it was time to modernise. The pulse welding function enables us to work with significantly greater process stability while, at the same time, substantially reducing welding spatter. Since then, we have integrated numerous TransSteel 4000 Pulse welding systems into our production. As a result, manual welding has become much cleaner and we have been able to reduce the amount of reworking required.

Furthermore, ease-of-use is something that is really important to us and that's something Fronius was able to deliver with the TransSteel 4000 Pulse. As a result, the welding system could be integrated and set up ready for use in just a few steps."

Professional support in sales and servicing

However, if welders still have questions about handling, system care, and maintenance, Roland Fellinger is clear: "Fronius is a top company and delivers top quality. That means that good sales and servicing are always available to us, something that is particularly important to us with regards to our productivity, because this cooperation ensures quick decisions and short turnarounds."

"We almost never switch business partners if we are happy with the partnership," adds Günther Huemer. "Fronius has been one of our suppliers from the very beginning. The Fronius brand stands for a level of quality that we need in the field of welding because, when it comes to quality assurance, our main focus is on the welding technology and the quality of this is reflected in the life cycle of our products."

Fronius also stands for sustainability at Guntamatic

Moving beyond welding technology, Fronius also supports Guntamatic in the area of sustainability. Günther Huemer concludes: "In light of our corporate philosophy, we place great importance on improving sustainability in the use of energy at our production site. It's about CO_2-neutral production and naturally, in this context, our attention once again fell on Fronius."

"The question here was who belonged to the leading suppliers in the area of solar energy and we are delighted that we are now able to operate our 20,000 m^2 photovoltaic system with Fronius inverters."

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Robust Feed U82 wire feeder offers unmatched combination of advanced process controls and extreme durability

ESAB has launched the Robust Feed U82 wire feeder, which includes a full suite of advanced process control functions that help users increase competitiveness through consistent weld quality and appearance, address workforce skill issues, improve productivity and reduce operating costs through more uptime. The feeder accepts 200 and 300 mm wire spools and is designed to work with ESAB's Aristo® 500ix and Aristo Mig 4004i Pulse power sources for MIG/MAG, pulsed MIG, flux cored and TIG welding, as well as carbon arc gouging.

The Robust Feed U82 combines the extreme durability of a portable, enclosed feeder and the precision wire feeding and control of a shop-style feeder. Its PreciDrive wire drive system delivers better arc starts and stops without backlash or play in the gears and features a 4-wheel drive system. Large diameter, 38 mm, drive rolls offer more gripping area and provide more pushing force without deforming soft cored and aluminium wires, a common source of feeding problems. It handles solid wires up to 2.0 mm and cored wires up to 2.4 mm and feeds wire at speeds of 0.8 to 25.0 m/min.

"With the introduction of the Robust Feed U82, which offers our most advanced control panel, users in every industry can take advantage of the unique productivity, reliability and durability benefits of Robust Feed," says Arne Lagerkvist, global product manager for heavy industrial welding equipment at ESAB. "This feeder also offers ESAB's exclusive SuperPulse modified pulsed spray transfer process. SuperPulse combines a conventional pulsed waveform and with a second waveform or process to achieve specific goals when welding aluminium or stainless steel."

SuperPulse process combinations include pulsed MIG/short arc transfer, which provides maximum control over heat input when welding thin sections and for root-pass welding. Pulsed MIG/pulsed MIG is designed for welding material from 1.6 mm and thicker with great control over heat input, bead profile, bead appearance and travel speed. Spray arc transfer/pulsed MIG delivers higher productivity on thicker sections while still preserving the ability to weld vertical-up without any weaving motion, which reduces operator fatigue.

Ultimate control

Robust Feed U82 enables users to set limits on voltage and amperage, ensuring that operators can't step outside of a set welding procedure. Further, once weld parameters have been set, the control can be locked, preventing unauthorised personnel from changing them. Additional quality functions include storing data on the last 99 welds, monitoring production statistics such as arc-on time and quantity of wire consumed and exporting statistics and procedures using a USB connection.

Robust Feed U82 enables users to create custom synergic lines or to choose from 259 factory-programmed synergic lines for steel, stainless steel, aluminium and NiCrMo alloys using the MIG, pulsed MIG or SuperPulse™ processes. Preprogrammed synergic lines speed setup because they have optimised parameters for the wire type, wire diameter, shielding gas and process selected. Data associated with each synergic line can be fine-tuned and subsequently stored and the U82 can store up to 255 welding schedules.

Synergic lines for pulsed MIG can save many hours of process development time. To begin pulsed welding, operators simply select the synergic line. The system then provides optimum dynamic arc control to maintain consistent penetration and weld bead appearance, automatically adjusting

for variations in arc length and wire feed speed. If needed, operators can use the wire feed speed control to fine tune the arc and all pulsing parameters will be automatically adjusted.

Robust Feed U82 offers all standard controls, as well as Qset and Short Circuit Termination (SCT). Qset or quick set automatically optimises the short circuit arc for the gas/wire combination installed. After a few seconds of welding, the system adapts welding parameters to match an operator's individual welding style, notably compensating for variations in contact tip to work distance and torch angle, such as when operators manoeuvre the torch around corners. This lets the operator focus on torch mechanics instead of worrying about whether they have set proper parameters. SCT technology sharpens the end of the solid MIG wire at the termination of a weld to promote a positive next arc start, reduce spatter and reduce the possibility of cold lap. SCT technology also eliminates the need for the operator to clip the wire.

The Robust Feed U82 includes a 50 mm dinse connection on the back for the MMA or gouging torch and, when paired with an Aristo 500ix power source, allows operators to select the gouging mode at the feeder, eliminating the need to return to the power source to set process mode or switch cables for gouging. In addition, the Aristo/Robust Feed U82 combination gouges using a CV output. CV provides smoother gouging performance because the system will adjust the output current to maintain a set voltage even as the distance between the carbon and workpiece varies.

Award winning

Robust Feed, which won the prestigious Red Dot Award for product design, improves ergonomics. When carried by the middle handle, it rests comfortably against the side of the operator's body when walking longer distances. Closer to the point of welding, additional front and rear handles make it easy to carry up a ladder, manoeuvre through confined spaces or pass the unit from one person to another.

The Robust Feed U82 offers an IP23 models protection class rating, other models offer an IP44 rating. A completely-sealed wire feed compartment protects the wire from water splashes, dust and other contaminants. An optional heater inside the wire feed compartment drives off moisture to preserve wire integrity and double-wall design has special zones to provide impact and abrasion resistance. The controls, power and gas cable connections are protected inside the housing and a reliable strain relief removes cable stress.

The Robust Feed series also includes the Robust Feed Pro, Robust Feed Pulse and Robust Feed U6 models. Target markets include traditional portable feeder applications in the ship, boat, civil construction, offshore, railcar and heavy maintenance industries, as well as users in structural steel, tank, vessel, trailer, mobile equipment and general fabrication.

"Between grinding dust, dirt and physical abuse, workshop environments can be extremely demanding," says Arne Lagerkvist. "The durability of Robust Feed can improve uptime in all applications, while its PreciDrive wire drive system maintains precision wire feeding performance to promote consistent weld quality."

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Ultrasonic technology

A sound solution for automotive component assembly

Ultrasonic technology continues to be adopted as the process of choice for a growing number of plastic welding applications, many of which are within the automotive sector.

The precise control and resultant consistency in the process, makes it the ideal solution for joining and welding a wide range of polymer types and component variants.

In a recent application by Poole-based Telsonic UK, "B" pillar products for the new Land Rover Defender are assembled using the company's ultrasonic technology by KASAI Slovakia.

The system, designed and built by Telsonic UK and shipped to Slovakia, is used to weld left and right hand B pillar assemblies joining the seat belt cowls to the polypropylene pillars. Correct assembly is assured through the use of sensors to detect that all parts are in place, including the cowl, main pillar substrate and the airbag cover.

The machine also senses two colour variants of each of the three parts and also checks that metal clips and black felts are in position using a combination of inductive and camera sensors. Quality limits are also set for both weld delivery and collapse of the weld features. Individual component parts are manually loaded into PU nests mounted onto an Indexing table, with the parts being secured within the nests by swing clamps.

Its weld features are tubular staking pins and are formed to JLR weld specification by four Telsonic manufactured twin Titanium mother-daughter sonotrodes, fixed to four Telsonic 35kHz AC450 actuators complete with SE3512C converters including integrated cooling. The sonotrodes are powered concurrently by four Telsonic MAG3512E generators, selectable for Right or Left hand part only weld operation if necessary. Weld cycle time is 15 seconds per pair of "B" pillars.

The machine is fully guarded with Keyence light guards and painted and finished to Kasai Slovakia's strict site requirements and specifications. In addition, the HMI and manuals are Dual Language. Bar Code labels are printed for Left and Right hand parts, only if all component parts are sensed as being present and the weld quality meets the pre-determined thresholds. A further check is then made to verify the position of the bar code label. The component parts are only released from the clamps if all of the above criteria are met.

Telsonic's reputation for delivering robust and reliable ultrasonic welding and joining systems to the automotive sector, together with an established supply, service and after sales support relationship with Kasai within the UK and Slovakia, were key factors in the decision to purchase this new machine from Telsonic UK. Telsonic UK offer a comprehensive range of ultrasonic modules and systems for a variety of plastic and metal welding, cutting, sealing, cut'n'seal, food cutting and cleaning applications within a wide range of industries. More information on Telsonic products and systems for plastic welding can be found by visiting: **www.telsonic.com/en/plastic-welding/**

Telsonic AG is an international enterprise in the field of industrial ultrasonic technology and one of the global market leaders. The company, which was founded 52 years ago and is based in Bronschhofen, Switzerland, employs approximately 250 staff worldwide and has subsidiaries in the UK, Germany, Italy, the U.S., Canada, Serbia, China and Korea, as well as representations in many other countries. Telsonic manages all product development and manufacturing in-house, capitalising on its professional expertise and configuring projects to meet specific customer requirements. Its reliable on-site technical service completes its offering. This is all possible thanks to its expertise, which has been gained over many decades.

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