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MAGNIFICENT SEVEN



They came. They saw. They conquered.

Seven new and magnificent machines.

And seven good reasons why you should visit MACH 2022 and make our stand (**Hall 19 - Stand 100**) your first port of call when you do.

New mill-turn machines. New lathes and turning centres.

And new machining centres.

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The magnificent seven!

Mills CNC, the exclusive distributor of Doosan machine tools, is showcasing sixteen machines on its stand at MACH 2022, seven of which are making their UK debuts at the event.

The new 'Magnificent Seven' machines comprise the following:

New mill-turn machines

The 8" chuck SMX 2100ST is a multi-tasking machine with a 1,040 mm maximum turning length, left and right opposing spindles, 5,000 rpm, a B-axis milling spindle, a Y-axis and a 12-station lower turret.



The larger capacity 21" chuck SMX 5100LB has a maximum turning length and turning diameter of 3,050 mm and 830 mm respectively, a left-hand spindle, 37 kW/1,500 rpm, a servo-driven tailstock, a B-axis milling spindle, integrated thermal compensation and up to a 120-tool position ATC.

Both machines will appeal to manufacturers operating in and across many sectors where accuracy, process reliability and the ability to machine complex parts quickly and economically is critical.

New machining centres

The SVM 4100 is a high-productivity vertical machining centre designed for fast and accurate machining of aluminium alloys and lightweight steel components. The machine boasts fast acceleration/deceleration rates, fast tool change times and impressive rapid rates.

The BVM 5700 is a premium machining centre that, owing to its rigid design and build, delivers exceptional accuracies, greater flexibility, unrivalled machining performance and best-in-class process reliability.

The T-4000HS is a high-speed machining centre with 48 m/min rapids, a 11 kW/24,000 rpm spindle and a 21-tool position ATC. The machine is ideal for rigid tapping and drilling operations and, at MACH, has been integrated with a SYNERGi Sprint automation system to create an automated high-speed manufacturing cell.

New turning centres

The 10" chuck Lynx 2600SY is a compact, high-performance turning centre equipped with a Y-axis and sub-spindle which, for the show, is integrated with an advanced SYNERGi Premier automation system to create a flexible, highly-efficiency automated manufacturing cell designed for the continuous production of small precision parts.

The multi-tasking TT 1300SYYB is an innovative twin-spindle/twin-turret turning centre with Y-axis capabilities on both its upper and lower turrets.

Tony Dale, CEO of Mills CNC says: "Our 'Magnificent Seven' machines have all been prepped and are raring to go. They're just waiting for you."

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Hall 19 - Stand 100

MACH 2022 is almost sold out

Register now for this unmissable event

MACH 2022, the first national gathering of the UK engineering community post COVID-19, is demonstrating the strong momentum being generated in the UK manufacturing sector by selling almost all of its exhibition space.

With just weeks to go until the doors open on the show at the NEC in Birmingham, the growth impetus within this key sector is reflected by the news that the landmark exhibition is now almost sold out, with more exhibitor interest being expressed every day.

Show organiser and national trade association, the Manufacturing Technologies Association (MTA), says the huge support for the event was clear evidence that the UK engineering community was eager to demonstrate its ambitions to emerge from the pandemic stronger than ever.

The association is now urging people to register for the showpiece event, which takes place at the National Exhibition Centre in Birmingham between 4-8th April 2022, as quickly as possible so as not to miss out on the exciting content and updates in the run up to the show.

James Selka, CEO of the MTA, says: "MACH is the national manufacturing and engineering show and as a content-led event it brings together the latest advanced engineering and manufacturing technologies in operation and all under one roof. As such, it will be the perfect place for manufacturers to come and view the best new machines on the market.

"The impetus we have seen in the manufacturing sector of late is clear evidence of the intention amongst the engineering community to demonstrate its resilience and to show exactly why the confidence surrounding the sector is not misplaced. There is a clear appetite to do business, as well as a desire to restore the manufacturing industries to their rightful place within the UK economy."

MACH 2022 will be the event to connect the world of manufacturing technologies and stand as the destination of choice for companies looking to adopt and invest in the digital revolution.

"MACH is such a fantastic event for both exhibitors and visitors. Showcasing live,



digital production systems in one space, it is not to be missed. Hundreds of millions of pounds worth of business is discussed, secured and completed at the exhibition, making it the must-attend event in the UK manufacturing calendar," adds James Selka.

With UK manufacturing being so broad, the MTA is collaborating with other associations in the sector, many of which are taking pavilions at the MACH show, so they can promote their own messages. Most notable amongst these, is the MMMA, which will be bringing one of the largest pavilions to the NEC to ensure the needs of the metal working sector are represented alongside those of the other manufacturing technologies.

In this way, MACH is not just a showcase for the manufacturing technologies sector, but a celebration of the manufacturing industry at its best: the development of the digital factory, new automation solutions and connected manufacturing processes, power by the hour and the cost efficiency solutions that will dramatically improve production processes and help shape the industry over the next decade.

Other themes evident during the show will be decarbonisation and the drive to secure a net zero economy. Decarbonisation is predicted to be one of the major growth opportunities for the manufacturing sector in the next few decades. The Committee on

Climate Change believes the UK's commitment to net zero by 2050 alone could cost an additional 1-2 percent of GDP.

New opportunities for the UK's manufacturing supply chain will also be a focus. The MTA believes a more sustainable approach to the UK supply chain, with more intelligent sourcing of product from within the UK will benefit the entire economy.

To better reflect this, The Engineering Supply Chain Show, will run alongside the main exhibition and highlight some of the opportunities that can be found within the UK supply chain. This new exhibition is where engineering and manufacturing buyers can go to find world-class suppliers, exclusively in the UK engineering and manufacturing supply chain.

Visitors can register for their entrance pass via the MACH website <https://www.machexhibition.com/visit/visit-mach-2022-em>

Further information about the MTA and its members can be found at www.mta.org.uk

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Citizen to present new sliding and fixed head lathes

Citizen Machinery's ground-breaking Low Frequency Vibration (LFV) chip-breaking software, which forms part of the operating system in the controls on some of the manufacturer's sliding and fixed head mill-turn centres, will feature strongly at MACH 2022 as this year marks the fifth anniversary of the technology's launch. The principle of operation is distinct from and, superior to, pecking macros programmed into individual machining cycles.

The patented system is gradually being rolled out across the company's Cincom sliding head lathes, initially on the main spindle and more recently also on the sub spindle. To enable this, the construction of the machine models is systematically being strengthened to withstand the rigours of the momentary air cutting that creates the chip-breaking effect. There will be five Cincom machines on show at MACH equipped with LFV. A pair of Citizen's Miyano fixed head lathes also benefits from the technology, one of which will also be exhibited.

The chip-breaking functionality can be switched on and off by G-code during a cycle, when deemed expedient, as if it were part of the program. The size of the actual chips can also be predetermined, as close control is maintained over the relationship between spindle speed and LFV oscillation of the tool by tens of microns, which has the effect of repeatedly retracting the tool tip clear of the workpiece. Coolant is able to penetrate the cut more efficiently, so tool life is extended and surface finish is improved.

A total of 12 bar fed, sliding and fixed head mill-turn centres will be demonstrated under power on the Citizen Machinery UK stand at MACH, including an automated production cell with integrated loading and unloading. Accent will also be placed on high technology software and mechanical enhancements that extend the scope and efficiency of machining on the Japanese-built lathes.

Making its world debut will be the new, 20 mm bar capacity Cincom L20-XIIB5LFV. The series-5 Cincom M32-VIILFV will appear for the first time at a MACH show, as will the fixed head Miyano BNE-65MY. Both have



been redesigned to offer more power and flexibility and have been fitted with the latest Mitsubishi 800-series touchscreen control. Consequently, the latter machine is Citizen's first 65 mm capacity lathe to offer superimposed machining, which allows three tools to be in cut together under simultaneous 5-axis control for elevated levels of productivity.

On show for the first time will be a Cincom L32-XLFV with integrated, high-speed laser cutting, a capability that was originally developed for efficient production of apertures in thin-wall stents on smaller Citizen sliding head lathes.

There will be a Cincom D25-VIILFV exhibited for the first time at a MACH show with the proprietary chip-breaking software. As on many other sliding head lathes manufactured by Citizen, the user has the advantage of being able to remove the guide bush for more economical material usage when producing shorter components up to typically 2.5 times the bar diameter.

The exhibition will also feature the first showing at a national exhibition in the UK of the 12 mm bar capacity Cincom L12-XLFV with five rear-facing static and driven

end-working tool positions and the addition of a Y-axis on the counter spindle to mirror the main spindle's 3-axis movements. The machine is intended primarily for production of dental abutments and implants, as well as other complex components.

Launched in mid-2019, the Cincom 8-axis L32-XLFV will be on show for the first time at a MACH exhibition, without the optional LFV software but with the addition of high-speed, in-cycle laser cutting. The technology, which was originally developed for efficient production of apertures in thin-wall stents, is capable of fulfilling a wide variety of additional operations when machining tubular stock, or bar after it has been drilled longitudinally.

Citizen Machinery UK Ltd

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New technology on largest stand ever for Sodick at MACH

With more new machines, more new technology and more to shout about, Sodick Europe, together with sole UK distributor Sodi-Tech EDM, has taken its largest stand ever at MACH 2022. After a bumper couple of years, despite the upheavals and uncertainties caused by the pandemic and Brexit, it is looking forward to demonstrating a wide range of the latest technology to MACH visitors at the NEC. Sodick machines on the stand will include the latest wire EDM machines: the ALC400P and ALC600G both with iGroove technology, the VL400Q precision wire machine, an AL60G die sinker configured with an Erowa Robot and a Zeiss measurement machine, the AD35L die sinker, the UH650L high speed milling machine, the new K4HL aerospace and energy focused small hole driller and the GL30A injection moulding machine.

Seen for the first time in Europe, the new K4HL 5-axis EDM small hole drilling machine has been developed specifically to meet the needs of the aerospace and energy industries, for the high-speed drilling of the thousands of small, high-precision holes in exotic materials for jet engine and other turbines.

Facilities that make the K4HL particularly suited to the aerospace sector include: full 3-axis standard contouring or orbiting capability for the machining of small, high-precision diffuser holes in jet engine blades and vanes, breakthrough detection function which eliminates back-striking in small chambers, reducing the potential for part scrapping when drilling unattended,



and the SPK power supply which has been developed specifically for high quality small-hole drilling in difficult-to-burn materials such as titanium alloys/nickel alloys, iron/cemented carbide/copper/aluminium/brass.

Also making its first appearance at a European exhibition, the ALC400P and ALC600G, two new wire machines, are equipped with Sodick's unique iGroove technology. This new mechanism, patented by Sodick, rotates the wire during the skim cut operation, so that workpieces are machined from top to bottom with the "unconsumed" surface of the wire. Conventionally, wire electrodes are controlled solely by tension and running speed, while being constrained by a die. Sodick's iGroove rotation mechanism



provides additional control over the wire. This results in increased surface quality and improved geometric accuracy whilst, at the same time, minimising wire consumption combining the best ecological solution with the highest quality of EDM machining.

In addition to the iGroove wire machines, Sodick will also be showing the small footprint, high precision VL400Q, an ideal machine for the manufacture of high precision parts for the automotive, aerospace and medical sectors. This machine comes as standard with linear motors and absolute linear scales on the X, Y, U and V axes, excellent ergonomics, as well as options for Taper Flex NEO, Jumbo wire feeder, wire chopper and WS4P/5P rotary table.

Sodick's new model AL60G combines Sodick's advanced technologies and latest



innovations to provide unrivalled machining performance. In addition to linear motors and absolute linear scales on the X, Y, Z axes, the machines include a linear motor cooling unit, dielectric fluid cooling unit, nano-wear discharge unit and a wealth of other productivity-boosting technology. There are additional options for C-axis SEC10, an ATC unit, 6, 12, 16 or 32-station, high precision rotary head and 8-axis simultaneous control SP-E.

At MACH, the AL60G machine will be configured with an Erowa Compact 80, with JMS MoldLine software and a Zeiss DuraMax measuring probe system. The small footprint AD35L, with its innovative design, including independent X and Y axes, offers extreme machine rigidity, enabling optimum performance at high-speed and rapid acceleration of the linear motors, to provide highly accurate machining capability.

The powerful UH650L machining centre benefits from Sodick's linear drive expertise, creating a machine which avoids the necessity of separately executing rough and fine milling, and executes both machining passes in one operating mode. This results in enhanced dimensional accuracy, surface finish and tool life, so reducing cycle times and increasing productivity. Standard features include a linear motor temperature controller, LN4X controller, spindle temperature controller, tool tip cleaning system, mist coolant, collector and filter and a 16-station automatic tool changer.

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Hall 20 - Stand 310



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Double MACH debut for automated Matsuura 5-axis CNC machines

As a pioneer of automated 5-axis CNC machining, Matsuura Machinery continues to lead the way with MACH debuts of the MAM72-52V and the MX-420 PC10. Both machines are the latest additions to the world-renowned MAM and MX series which will be proudly demonstrated on the stand.

Designed from the ground up and based upon 30+ years of multi-pallet automation innovation and excellence, the Matsuura MAM72-52V is a "factory in one machine" that enables variable-part/variable-volume production and extended unmanned operation. Equipped with 130 tools on a 330-tool magazine base, proven tower pallet system (PC15) for extended lights out manufacturing and chip removal system as standard.

This high-speed, large-capacity 5-axis vertical machining centre delivers Matsuura's 5-axis performance and sits proudly in a unique capacity position within the MAM72 product range, bridging the gap between MAM72-35V and MAM72-70V.



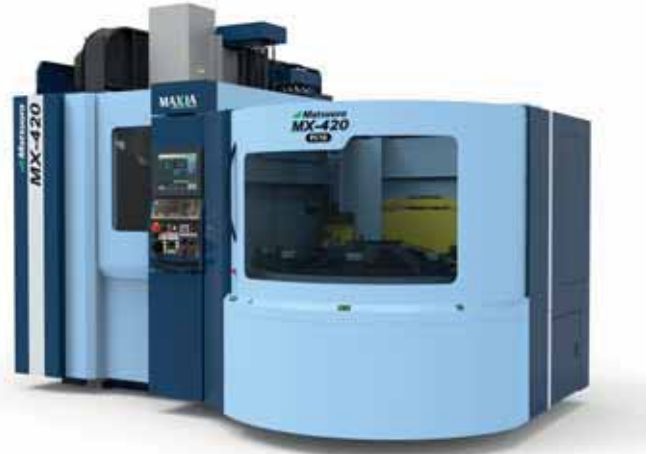
Suitable for a large array of work in many industries, machining the full spectrum of materials, from exotics, titanium, to aluminium and cast iron to "hard to cut" machining challenges.

Following the remarkable global success of the MX-330 PC10 and responding to customer demand, Matsuura has developed its big brother: the fully automated 5-axis MX-420 PC10, with larger capacity and workload. The MX-420 PC10 is also making its UK debut at MACH.

From the Muratec portfolio, Matsuura will be exhibiting an MT Series fully automated lathe, with features including twin spindles, multi-tasking functionality and an intelligent gantry unloader. Happy to process billets or bar, the MT Series are a firm favourite with UK customers. Muratec CNC machines are a division of Muratec Murata, a large global family of class leading automation solutions.

No stranger to metal and 3D printing, Matsuura is also demonstrating the Desktop Metal Studio System 2, a desktop 3D printer ideal for producing complex, high-performance custom metal parts in a variety of materials. Also on show from Desktop Metal is the Fiber™, a composite 3D printing machine with great potential in aerospace, and motorsport.

Roger Howkins, managing director at Matsuura Machinery Ltd comments: "With a buoyant and busy UK manufacturing sector,



MACH 2022 is set to be a great show for Matsuura, our wider industry and our growing UK customer base. We've selected machines to exhibit that continue to lead the field in reliable CNC automation and deliver a great return for our customers and deliver new possibilities into their CNC businesses with our 3D printing products. After a hugely successful 2021, our whole team is looking forward to meeting the market again at MACH 2022 the UK's premier manufacturing technology show."

Providing OEM's, SME's and subcontractors with automated multi-axes CNC machining solutions, metal and plastic 3D printing systems and innovative, fully engineered and optimised manufacturing processes, Matsuura offers leading customer support and fully trained multi-skilled engineers.

Matsuura was established in Japan in 1935 and, since then, has pioneered innovative design, development and manufacture of high-quality machining centres. In 1995, the company introduced the now legendary MAM72 Series of 5-axis machine tools, ushering in and defining a new age of unmanned palletised and fully automated pallet pool CNC machining production.

The company was the original developer of the concept of true high-speed machining and high speed spindles, introducing a 20,000 rpm spindle that fundamentally changed global aerospace machining operations. Matsuura produces a range of outstanding high precision machining centres covering all industry sectors. These include horizontal CNC machining centres and vertical CNC machining centres in various sizes, configured with 3-axis, 4-axis to 5-axis, single table, twin and multi-pallet systems, automated pallet pools, multi-pallet changers, automatic pallet changers, modular automatic tool changers, FMS cell systems and its range of ultra high speed linear motor CNC machines. 5-axis machines are available with Matsuura's OEM automated pallet pools and extended tool changers.

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Turning up productivity at MACH

Dugard Machine Tools will be showcasing a raft of new machines, with many receiving its MACH exhibition debuts. At the show, Dugard will be introducing no fewer than four new machine tools on its stand.

With one of the most diverse portfolios of machine tools in the UK, Dugard will be introducing the Kitamura MedCenter5AX 5-axis vertical machining centre for fast precise machining. Complementing the MedCenter5AX from the milling stable will be the larger Dugard GTX-620 5-axis machining centre. With vastly different configurations, the two machines will highlight just a small element of the expansive Dugard milling range.

To showcase the breadth of its machine



tool offering, the Brighton-based machine tool specialist will give a MACH premiere to the Hanwha brand of sliding head turning centres. The Hanwha brand from Dugard has taken the sliding head market by storm since entering the UK just over two years ago and the robust Hanwha XD38R will certainly draw interest from manufacturers in this market segment.

For the machining of small and production run turned parts, the Hanwha XD38R sliding head turning centre can be driven by the recognised FANUC 32i-B or Siemens828D CNC interface. The machine also incorporates the facility to rapidly switch from guide bush to non-guide bush operation. With a 38 mm bar capacity and a 6,000 rpm 5.5/7.5 kW main spindle motor

that is complemented by a 6,500 rpm 2.2/5.5 kW sub-spindle, the new Hanwha XD38R offers precision and flexibility to suit any sliding head machine shop.

The impressive Hanwha XD38R also incorporates a multitude of tooling configurations with five OD turning tools, five ER20M front spindle tools and five cross-drilling tools, as well as four fixed and four driven sub-spindle tools. With the configurable tool platens and positions, the Hanwha XD38R offers fast setup times, a spacious work envelope with plentiful operator access and, most importantly, kinematics that position all tool stations close to the workpiece for unbeatable productivity rates. As well as a host of main and sub-spindle tooling configurations, the Hanwha XD38R can be specified with a host of additional options such as bar feeders, chip conveyors, oil mist collectors, off-centre drilling, oil chillers and much more.

cutting that ultimately enhances surface finishes, tool life, component quality and productivity.

The extremely robust machine with sub-spindle hosts a 6-inch chuck, 8-inch optional, with a 650 mm swing over bed capacity that allows a maximum machining diameter of 395 mm and a maximum turning length of 490 mm. This spacious work envelope ensures the robust workhorse caters for the diverse demands of the industry. The SMEC SL2000ASY has a bar capacity of 52 mm, optional 68 mm and a powerful 18.5 kW spindle motor that combine to enable heavy-duty manually loaded or automatically barfeed machining of relatively large diameter parts. For manufacturers that demand one-hit machining, the sub-spindle on the SL2000ASY is extremely powerful and flexible. Both the SMEC and the Hanwha ranges are available in a variety of configurations and capacity sizes to meet



For manufacturers looking for an even larger and more powerful turning centre, Dugard will be demonstrating one of its most popular machine tools, the SMEC SL2000ASY turning centre. Built upon the foundation of a single-piece Meehanite casting that is heavily ribbed with a torque tube design, box slideways are used throughout the SMEC range, resulting in outstanding vibration dampening and thermal displacement characteristics. This combination permits powerful heavy-duty

the complete needs of the marketplace. Come and visit MACH 2022 and talk to the experts from Dugard to see how your machine shop productivity can be improved.

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Hall 20 - Stand 640

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Guhring to premiere new milling lines

Guhring will be introducing new product lines alongside established industry-leading ranges at MACH. Its stand will showcase a complete range of threading, turning, drilling and milling tools, many of which will be cutting live at the show on a GROB 5-axis machining centre.

From its extensive milling portfolio, Guhring will be giving a MACH show debut to the impressive new RF100 Sharp Series of high-performance end mills and this range will be put through its paces on the GROB machine to emphasise the performance characteristics of the end mills. Designed to address the issue of machining soft, tough and high-alloyed materials that create an issue with swarf clearance, the new RF100 Sharp Series is Guhring's sharpest solid carbide milling tool to date.

The new RF100 Sharp demonstrates extremely smooth cutting action and chip removal and is also an extremely flexible end mill suitable for slotting, ramping, roughing, helical milling, finishing and trochoidal cutting. The smooth cutting action, combined with the potential to be used in a wide variety of applications, makes the new RF100 Sharp the end mill of choice on challenging material types.

The 4-flute end mills are suitable for machining steel, stainless steel, aluminium, aluminium alloys and other challenging materials. Available in three versions, an



extra-long design long (DIN+) is an extension on the long (DIN) version, but has an even longer cutting edge and there is also a standard-length end mill. The RF100 Sharp is offered in all common sizes up to 20 mm diameter. Depending upon the chosen diameter, the RF100 Sharp is supplied with an overall length from 50 to 104 mm with a flute length from 3 to 41 mm.

Following the success of the Diver Series of end mills, Guhring has now extended the benefits of this leading series to the micromachining sector with the new RF100 Micro Diver. The new micro-precision milling range is a universal tool for every material and application. Providing plunging and milling in a single tool, the new RF100 Micro Diver permits extreme cutting values with very highly cutting depths. Available in two variants, the 6808 and 6809, the RF100 Micro Diver features a symmetrical drilling face for stability when ramping and drilling, a new transition geometry to improve rigidity and an innovative flute form that further enhances rigidity and eliminates vibration.

The RF100 Micro Diver Series is suitable for cutting materials up to 48HRC at depths up to 5XD. With a 40 degree helix angle to evacuate chips from the work area when conducting high-speed machining, the Series is available with a cutting diameter from 0.79 mm to 3.175 mm with a multitude of dimensional increments available.

Appearing alongside the new ranges will be established lines like the RF100 5-Speed and RF100 7-Speed solid carbide end mills. Developed for the machining of very tough materials, the RF100 5-Speed and RF100

7-Speed solid carbide end mills take cutting speeds and process reliability to a new level. The increased tooth number of the five-fluted 5-Speed and seven-fluted 7-Speed generate high metal removal rates with stable process reliability, even when processing the most difficult-to-machine materials. As part of the highly dynamic Guhring Trochoidal Cutting (GTC) series, the new RF100 5-Speed and RF100 7-Speed are perfect for machining tough stainless steels, special alloys and a wide variety of steel and cast-iron grades.

The new RF 100 5 and 7-Speed are available with cutting diameters of 6, 8, 10, 12, 16 and 20 mm with a necked diameter that permits cutting depths from 20 to over 60 mm depending upon the diameter selected.

Also, on show at MACH will be the Ratio[®] line of roughing end mills. With flat crested geometry and an optimised roughing profile that demonstrates 60 percent longer service life, the Ratio high-performance roughing cutter has several geometry adjustments aimed at providing performance. The Ratio increases material removal rates with its asymmetrical cutting flutes that reduce cutting pressure compared to smooth cutters.

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Hall 19 - Stand 210

DUGARD

Join us at MACH 22

Visit our stand to see the diversity of Dugard's World-Class portfolio.

We'll be demonstrating an extremely compact and versatile VMC from Kitamura alongside one of their more rigid and powerful 5 Axis machining centres, a powerful SMEC turning centre and an impressive Hanwha sliding head turning centre.



Kitamura MedCenter5AX

With a positional accuracy of ± 2 microns across the full stroke and repeatability of ± 1 micron, the MedCenter is one of the most accurate machines on the market.

With an X, Y and Z-axis travel of 254 by 330 by 330mm over a 170mm diameter table, the machine incorporates a 30 to 30,000rpm spindle with an HSK-E40 spindle taper that is connected to a 40-tool ATC that can change tools in just 1.5 seconds.

Kitamura MyTrunnion 4G

The Mytrunnion-4G 5-Axis Machining Center by Kitamura is rigidly built to withstand, while offering ultra-high precision simultaneous CNC machining.

With a positional accuracy of $\pm 0.000079''$ full stroke and repeatability of $\pm 0.000039''$ micron, the MyTrunnion is ideal for ultra-high precision simultaneous 5-axis machining.

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SMEC SL2000ASY

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The SMEC SL2000ASY has a bar capacity of 52mm (optional 68mm) and a powerful 18.5kW spindle motor that combine to enable heavy-duty manually loaded or automatically barfeed machining of relatively large diameter parts.


Hanwha XE20

The Hanwha range from Dugard is already disrupting the market with its remarkably wide product range and flexibility.

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Third MACH appearance for GROB

Following its debut in 2014, the GROB Group will be exhibiting for the third time at MACH. On its joint stand in Hall 19, GROB, in conjunction with Guhring, will demonstrate the machining of a steel component on a G550 - Generation 2.

GROB UK will present one of its latest Generation 2 horizontal 5-axis universal machining centres at MACH. This year's demo will showcase a die and mould component highlighting the unsurpassed maximum tool length available on a GROB.

The machine that will be used at the exhibition will have the pioneering GROB4Pilot control system and is supplied with a 16,000 rpm machine spindle, HSK-A63, with torque of 206 Nm and output of 32 kW, 40 percent ED.

G550 - Generation 2

The second generation of GROB universal machines is characterised by a modern



machine design and a number of new assemblies and thus provides a whole range of advantages for GROB customers. The possible uses of the machine concept are extended yet further with the G550 – Generation 2. Its hallmarks are the high dynamic performance and stability of the machining centres, as well as the much narrower design and the marked reduction in chip-to-chip time. The maximum tool length has been increased to 700 mm. The number of HSK-A63 tools within the machine has been increased to 137. Like its little sister, one of the impressive features of the G550 – Generation 2 is its ergonomically favourable tool loading point at the operator's end. The second generation of the G550 is also characterised by its optimum chip fall behaviour. It prevents the build-up of heat in the machine as a result of



chips being left on the workpiece or on the clamping mechanism.

An entire spectrum of new technologies and advancements

With its unique machine concept, the 5-axis universal machining centres offer all metal cutting industry customers almost unlimited possibilities for machining work pieces made of various materials. Whether for the aerospace industry, machine manufacturing, the tool and die industry, the automotive sector or medical technology, GROB universal machining centres are optimally designed for the wide range of requirements of individual manufacturing sectors and are based on the same standard component program. They not only stand out on account of their compact design, their excellent visibility in the work area and outstanding accessibility, but also because of their high process reliability, recognised cost-effectiveness and long service life.

Now available in the second generation, GROB engineers have again succeeded in integrating a number of technical innovations and advancements that substantially improve GROB universal machines. Due to a repositioning of the tool magazine, they were able to reduce the machine width from 2,450 mm to 2,000 mm, thus achieving a significantly smaller machine footprint. Furthermore, the tool

capacity now comprises 60 slots which can easily be increased to 120 slots with the double disk machine.

GROB Machine Tools UK

The oldest GROB subsidiary, GROB Machine Tools UK Ltd was founded as a sales and after-sales service subsidiary in Wellesbourne, in the heart of England, in 1990. It is now headquartered in Birmingham. Major British automotive manufacturers such as the Ford engine plant in Dagenham and the BMW plant in Hams Hall have been systems customers from the outset. In 2015, the first universal machine was supplied to the aerospace industry for the production of aluminum structural components. At the time, this application served as a reference project in aviation, an extremely important industry from a strategic point of view. Over 50 percent of all universal machines sold are now supplied to this key industry.

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Lantek will show how working with a sheet metal software specialist can transform your business

At MACH 2022 Lantek, a leader in sheet metal manufacturing software, will be demonstrating how working with an industry specialist will give you the ability to automate and control the whole of your business. This is achieved by analysing your machinery and customer KPIs and by digitising your factory in partnership with engineers that really understand the industry.

Lantek has 28,000 clients worldwide using its Expert software to drive their CNC machinery. Internationally, it has seen a 25 percent increase in its digitalisation business as companies realise how much of a difference starting on the path to a Smart Factory can make to profitability and efficiency. In the UK alone, 2021 saw a record turnover of over one million euros and a significant rise in interest in KPI analysis and digitalisation.

The Lantek Expert and Lantek Flex3d CAD/CAM solutions give companies the ability to automatically create CNC programs for virtually every sheet metal machine on the market and its advanced nesting software ensures that material utilisation is maximised. Building on the technology and capabilities of this software, companies can start by adding Smart quotation modules to quickly and accurately generate quotations for customers. They can then move on to Lantek MES which keeps track of scheduling and machine OEE and then to Lantek's Cloud-based analytics software, which will help them to understand the KPIs that are important to their company for both customer and manufacturing management.

Rob Powell, commercial director for Lantek UK says: "Making use of data about your customers and the performance of your machinery and resources in an intelligent and automated way is clearly the way to make a major change in efficiency and profitability. We can help companies in the industry take the first steps towards a Smart Factory, picking elements that suit their current manufacturing status and which are relevant to their businesses. With this



approach, we can work in partnership to develop a plan which will be easier to implement and which will clearly show the benefits of the technology at each step."

To increase its technology leadership, Lantek has a long-term plan for growth and investment in R&D which extends to 2025. Alberto López de Biñaspere, managing director of Lantek explains: "We have been experiencing double-digit organic growth for years. At the end of the third quarter of this year, sales were 30 percent higher than last year. We have traditionally invested large proportions of our income in research and development. Through our new partnership with TRUMPF, the largest industrial group in the machine tool sector, we now have the necessary resources to increasingly pursue this path. For 2022, we intend to make the largest investments in our company's history: We want to increase our commitment to research and development by 70 percent. To do this, we plan to grow our workforce by 50 percent over the next twelve months from the current 260 employees worldwide, with a clear emphasis on R&D and our international customer support team."

As part of this initiative, Lantek will be growing its over 150 OEM partnerships to deliver an open system which can drive almost every sheet metal cutting machine on the market.



MACH 2022 will give companies in the sheet metal sector an opportunity to find out how Lantek delivers the flexibility of being able to choose the best and most cost-effective machinery for their application and run it at its full potential. They will also be able to see the benefits of introducing Smart Factory techniques which give a clear path to much higher efficiencies, greater customer loyalty, increased order levels and greater profitability.

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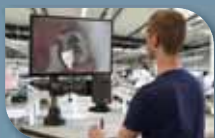
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Mills to focus on innovation and automation

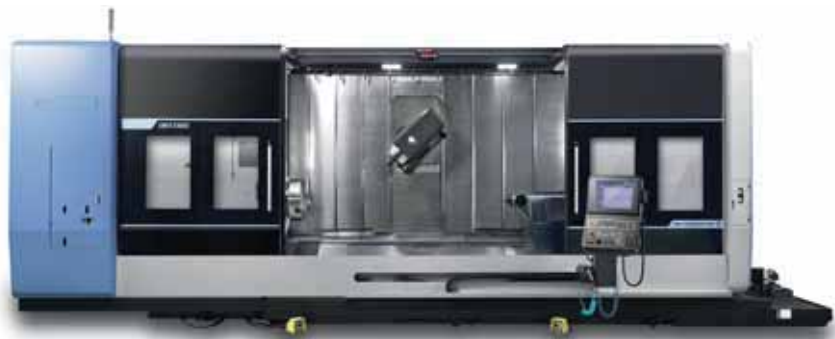
A total of 16 machine tools will be showcased at MACH by Mills, including seven new and innovative models, two advanced 'SYNERGi' automated manufacturing cells and three productivity-boosting cobots. New software solutions from its training academy, renowned hospitality and a guaranteed convivial atmosphere are all able to be seen and experienced on the stand.

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, is attending MACH 2022 with all guns blazing. Exhibiting from the largest stand at the show, Mills has announced that two key exhibition themes of innovation and automation have been seamlessly interwoven, across and throughout, the products, services and solutions on show.

Tony Dale Mills CNC's CEO, explains: "Being the first MACH show for four years we have decided to push the boat out at MACH 2022. Over the last few years, with all the challenges and issues that have been confronted and are still confronting component manufacturers, it's become increasingly clear that improving manufacturing productivity and operational efficiencies are central to the continuing growth, competitiveness and success of all UK and Irish companies.

"Our stand recognises this fact and is why we have decided to focus on innovation and automation at the event, showcasing the best we have to offer from what will be a memorable, different and distinctively designed stand."

Mills is showcasing a total of 16 machine tools, lathes and turning centres, machining centres and mill-turn machines, on its stand. These include seven new models that have only recently been introduced into the UK and Irish markets. Five of these machines are actually making their UK debuts at the show.



The seven new models comprise two turning centres, two mill-turn machines and three machining centres.

The two new turning centres being exhibited are: a 10" chuck Lynx 2600SY, a compact, high-performance turning centre equipped with a Y-axis and sub-spindle which, for the purposes of the exhibition, is integrated with an advanced SYNERGi Premier automation system to create a highly-efficient and flexible automated manufacturing cell designed for the fast, accurate and continuous production of small precision parts; a multi-tasking TT 1300SYYB, an innovative twin-spindle/twin-turret turning centre with Y-axis capabilities on both its upper and lower turrets will also be demonstrated. Both machines feature the latest FANUC Plus control with the innovative touchscreen iHMI.

Mills CNC has a reputation in the market for the power, accuracy, reliability and versatility of its SMX-branded mill-turn machines. This reputation is set to grow and be reinforced with the recent introduction of two new models, the SMX 2100ST and SMX 5100LB, both of which are being showcased on Mills' stand.

The 8" chuck SMX 2100ST is a multi-tasking machine with a 1,040 mm maximum turning length, left and right opposing spindles, 5,000 rpm, a B-axis

milling spindle, a Y-axis and a 12-station lower turret.

The large-capacity 21" chuck SMX 5100LB has a maximum turning length and turning diameter of 3,050 mm and 830 mm respectively, a left-hand spindle, 37 kW/1,500 rpm, a servo-driven tailstock, a B-axis milling spindle, integrated thermal compensation and, up to a 120-tool position ATC.

Both machines will appeal to manufacturers operating in and across many sectors and industries where accuracy, process reliability and the ability to machine complex parts quickly and economically is paramount.

The three new machining centres being showcased comprise the new SVM 4100, the BVM 5700 and the T-4000HS.

SYNERGi Premier and SYNERGi Sprint systems are being exhibited on Mills' stand where they have been integrated with a Lynx 2600SY lathe and a T-4000HS high-speed machining centre, respectively.

SYNERGi systems, comprising industrial robots, a range of different end-effectors, innovative part load/unload systems, laser floor scanning technology, industrial guarding and 17" touchscreen HMIs, powered by Mills' own proprietary SYNERGi software, represent a state-of-the-art, 'Factory-of-the-Future' automation solutions. There are three different cobot series, A, M and H, in the Doosan Robotics range and a total of five cobots are being showcased on Mills' stand.

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Mazak to focus on new machines, CNCs and the environment

New machines, easy controls and a focus on environmentally-friendly manufacturing are the headline-makers for Yamazaki Mazak at MACH 2022.

Mazak will exhibit a total of nine machines and three automation systems, that will include the UK trade show debut of Mazak's new entry-level vertical machining centre, the VCE-600. The VCE is a high-specification machine available at a competitive price, that features a large Y-axis stroke offering maximum space for workpieces and fixturing.

A further entry-level UK machine is the QTE-300 MSY SG, a compact turning centre capable of high productivity that has been designed to fit into even the smallest machine shop. The QTE has a generous swing diameter of 695 mm and is equipped with milling capability, a Y-axis and a second spindle.

Mazak is also adding to its range of high-performance machines with the new VCN-700 vertical machining centre, the first of a range of performance-line machines that deliver exceptional productivity and the capability of performing dynamic milling operations.

The QTE Series machines on the Mazak stand are the first to be equipped with new SmoothEz, the latest generation MAZATROL CNC that is making its UK trade show debut at MACH. Featuring a 15-inch portrait touch screen, SmoothEz, pronounced 'easy', combines three features: Ez Machining, Ez Operation and Ez Setup, to deliver outstanding productivity, accuracy and, in turn, profitability.

Automation will also be a key focus, with the UK-built CV5-500 5-axis machining centre appearing with an MA robot to provide a single source Mazak solution for customers, as well as the VARIAXIS i-300 AWC (Auto Work Changer). Laser technology will be represented by the OPTIPLEX 3015 Fiber III, equipped with a high output 10.0k W fibre laser resonator.

The latest generation of Mazak's phenomenally successful VARIAXIS technology, the i-800 NEO, will also make its UK debut. The VARIAXIS i-800 NEO is designed to deliver high-accuracy machining over extended periods and is



equipped with an exceptionally wide machining area for handling large workpieces or jigs, along with a variety of spindles to meet every industrial requirement.

The VARIAXIS i-800 NEO is designed to deliver a carbon footprint 22.7 percent lower than its predecessor over the course of its operational life, a reflection of Mazak's increased commitment towards environment-friendly manufacturing.

This commitment will be highlighted at MACH with the UK roll-out of Mazak's 'Go Green' initiative, that combines lower machine CO₂ footprints with technology that can help machine users record, analyse and optimise their energy usage. This Smooth AX Energy Dashboard enables the precise reporting of energy usage for each part made on the machine.

Finally, Mazak will also be launching its

new customer portal, iCONNECT, a highly secure platform that delivers advanced service offerings through digital connectivity. The new portal, accessible to registered Mazak customers, will deliver a host of benefits including remote machine diagnostics, monitoring and maintenance as well as parts ordering and professional training resources.

Alan Mucklow, managing director for UK, Ireland and national distributors at Yamazaki Mazak, comments: "MACH 2022 promises to be a window into the future of manufacturing for UK machine users. New affordable technologies alongside new high-performance machines, easy-program CNCs, plug and play automation and an increased focus on environment-friendly manufacturing, all combine to deliver a blueprint for productivity improvement and enhanced profitability.

"The market for new machines and equipment remains strong in the UK and we are confident that MACH 2022 will offer a further boost to the UK manufacturing sector. I look forward to welcoming visitors to our stand and demonstrating the range of new technologies available to them."

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Hall 20 - Stand 350

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Kerf to unveil new cutting technologies at MACH

Kerf Developments will be returning to the UK's showpiece manufacturing event with a multitude of impressive new technologies. As a leader in oxy-fuel, plasma and waterjet cutting innovations, the Rochdale manufacturer will present a dynamic mix of cost-efficient high technology cutting solutions that will undoubtedly attract visitors to its stand at the Birmingham NEC.

At MACH, Kerf Developments will be expecting its leading RUR2500P high-definition plasma cutting machine to create a spark of attraction for show visitors. The machine, with its highly acclaimed UltraSharp cutting technology, has been enhanced with new advanced technologies that make it the choice solution for subcontract profilers, fabricators, structural steel, construction, rail and heavy engineering professionals attending the exhibition.

This stalwart of the Kerf stable provides end-users with a unique cutting solution that combines both speed and precision with the consistently high cut quality and the lowest possible cost of manufacture.

Designed and manufactured for customers with high production demand, the RUR incorporates a rigid frame design that is ultrasonically stress relieved and manufactured to highly accurate tolerances to provide remarkable performance. It is this robust build quality and precision cutting that has made the RUR2500P such a popular choice for the structural steel and heavy industry sectors. The RUR2500P has a cut width of 2 m and the modular design permits table dimensions to be tailored to the demands of the end-user.

Alongside the RUR2500P, Kerf will be introducing innovations like the new Fineline 300 Plasma unit from Lincoln Electric that incorporates Advanced Piercing Technology and a new Watermist system. The new Fineline 300HD from Lincoln Electric delivers exceptional cut quality when cutting mild steel, stainless steel and aluminium while providing superior cut quality that minimises the need for grinding, edge preparation or other secondary operations.

Specifically designed to allow full user control from a single interface, customers can rapidly change plasma current and gas pressures for better cut quality and longer consumable life. Furthermore, the FineLine 300HD features easy maintenance and a system status through the HMI. With the smallest diameter 300A torch in the industry at 38 mm, the FineLine 300HD minimises secondary processing and maximises bevel and robotic cut capabilities with its new Magnum PRO LC300M torch.

Working in synergy with the UltraSharp 2.0, plasma current controls are all synchronised to precisely control motion, gas flow, cut speeds and height control. This enables the technology to minimise process errors to help provide repeatable, high-quality cutting for all geometries and material thicknesses.

The Fineline 300HD also includes Advanced Process Control, an advanced piercing system that provides highly repeatable hole cutting and minimises secondary processing whilst eliminating dross from the surface to allow small holes to be cut at an optimal height. This innovation improves concentricity,



cylindricity and perpendicularity of holes while extending consumable life and reducing piercing times. The advanced piercing system deposits dross and surface spatter through the pierced hole to provide a slag free cut surface, which eradicates the need for secondary finishing for end users.

The new FineLine 300HD also introduces a new water injection system that improves cutting performance on stainless and aluminium materials. Making the FineLine 300HD High Definition Plasma perfect for non-ferrous materials, the new watermist system further reduces dross on stainless steel and improves the cut quality on aluminium by using water as the secondary gas to control the atmosphere in the cutting zone.

Also making its MACH debut will be the new Optima waterjet cutting machine. This represents the most flexible machine available from Kerf, with its ability to cut a broad range of materials from granite and stone through to titanium, inconel, duplex, super duplex, tool steel, composites, acrylic, polycarbonate and much more. The flexibility of the machine permits cutting of this vast selection of materials with no changes to the setup other than the cutting speeds and feeds. The Optima is a premium grade machine with an excellent build quality featuring a heavy-duty CNC bridge design that will produce parts of the highest quality due to its rigidity and stability.

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Hall 17 - Stand 309

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NCMT to introduce new machines to the UK at MACH

The Okuma Spaceturn LB3000 EX II turn-milling centre will make its first appearance in the UK at MACH 2022 and comes equipped with the Japanese manufacturer's Armroid robotic arm, the first in the world to be integrated inside a CNC machine tool. It will be configured for automated handling of shaft-type parts. All Okuma machines are sold and serviced exclusively in the UK and Ireland by NCMT.

Three different end-of-arm effector options are available for the robot, capable of performing different tasks. One is for blasting the cutting zone with a mixture of air and coolant to improve chip management. Another provides additional support during the cutting process to prevent chatter. In combination with a workpiece stocker, the third effector is a two-finger gripper for holding shaft-type workpieces weighing up to 5 kg and then automatically loading and unloading them. All three end-of-arm effectors are stored within the machine and are changed automatically by the robot.

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, separate 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, the cycle being automatically generated to avoid collisions. Roid Navi software simplifies programming using images and on-screen guides.

There exists a longer, more powerful Armroid that can be integrated into a larger Okuma multi-tasking lathes. 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.

MACH 2022 will mark the UK launch of the D200Z 5-axis, vertical-spindle machining centre from Japanese machine tool builder, Makino, which is represented exclusively in the UK and Ireland by NCMT. The machine



will cycle through a reflector mould program and also being demonstrated will be Makino's iSetup, an on-the-fly probing solution.

From roughing to high-speed finishing of multi-faceted and 3D contoured geometries, the D200Z boosts productivity of complex dies and moulds typically found in the automotive, injection moulding, packaging, medical and optics markets. The machine's speed and precision provide a solid foundation for responsive, high-speed metal cutting and for the production of outstanding surface finishes that reduce or eliminate hand polishing.

The 30,000 rpm spindle and integral, direct-drive table provide quick, precise, full 5-axis machining. This capability combines with high-speed SGI.5 motion control software in the Makino Professional 6 CNC to maintain the tightest tolerances and quality requirements and ensure accurate blending of 3D surfaces, even during simultaneous 5-axis motions. All of these attributes are essential in the manufacture of modern dies, moulds and components of intricate geometry.

Designed to maximise working volume and load capacity, the compact D200Z accommodates workpiece sizes up to 300 mm in diameter, 210 mm tall and weighing up to 75 kg. The X, Y, Z axis travels of 350 mm, 300 mm and 250 mm respectively feature rapid traverse and cutting feed rates

of 60 m/min. The machine utilises a lightweight B-axis structure with 0 to +180 degrees of tilt at 100 rpm. Both the B-axis and 150 rpm, 360-degree C-axis table feature direct-drive motors for accurate, high-speed operation.

Wide base castings and core-cooled ballscrews serve as a platform for enhancing overall process stability. The HSK-E50 spindle is designed with a core and jacket cooling system to control thermal growth, deflection and vibration during high-speed machining operations. As a result, the machine extends tool life in addition to providing exceptional surface finish.

With flexible tool capacities and automation capabilities, such as the 100-tool capacity magazine with automatic tool changer and multi-pallet system, the D200Z can achieve utilisation rates of more than 80 per cent for high levels of throughput and fast return on investment.

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Hall 19 - Stand 120
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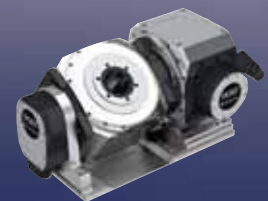
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Discover manufacturing connectivity in practice with Bowers Group

Bowers Group will be showcasing a variety of metrology solutions and offering live demonstrations to illustrate how effective data transfer between measurement equipment and applications can boost manufacturing productivity. With a strong focus on connective metrology, Bowers Group representatives will be willing and ready to show visitors exactly how Bluetooth enabled equipment and connectivity can improve efficiencies and reduce errors.

Attendees will have the opportunity to find out more about the range of precision measurement equipment available from Bowers Group, including a selection of products from Baty, Trimos, Sylvac,

Bowers DigiMic on display, a brand-new digital external micrometre. With its large screen and advanced, built-in Bluetooth connectivity, the DigiMic offers quick, simple and highly accurate measurements that can be easily integrated into any Industry 4.0/SPC system.

Also on display will be the new Baty R400 profile projector with 300 mm x 150 mm measuring range, which offers a range of improvements, including positive adaptations to the lighting system and focal length that make it an ideal tool for a wide range of parts. The FT2-E Touch Screen Display with the new high accuracy screen-mounted edge sensor features the

special this year given the delay due to COVID. There are, of course, many guidelines and precautions in place to ensure this is a safe event, as well as an excellent opportunity for us to showcase the very latest technology in data transfer between measurement equipment and applications."

As official metrology sponsor of the University of Wolverhampton Racing Team (UWR) and the University of Wolverhampton Engineering School, Bowers Group will also have the Mobile Metrology Centre on display in MACH's Education Zone, along with the University of Wolverhampton on stand 17-354. Apprentices, students and visitors will have the unique opportunity to witness first-hand the vast range of metrology equipment on board and learn more about how they are used.

"We are delighted to be able to give visitors to the Education Zone exclusive access to our Mobile Metrology Centre," continues Ryan Kingswell. "It's a great opportunity for us to capture students' imagination and interest in metrology and directly engage with the future talent of engineering and manufacturing. With the growing skills gap, it has never been more important for us to offer our experience and guidance regarding the tools that will inevitably become invaluable to them during their future careers."

Bowers Group
Tel: 08708 5090
Email: sales@bowersgroup.co.uk
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Hall 17 - Stand 354
Hall 19 - Stand 410



Gagemaker and WYLER. From bore gauges, micrometers and indicators to sophisticated vision systems, profile projectors and software, the Bowers Group stand will offer a comprehensive range of metrology solutions to suit all needs.

The company is delighted to have the new

latest Fusion Software which enables measurement data points to be taken automatically, removing operator influence and dramatically improving repeatability.

Ryan Kingswell, UK sales manager at Bowers Group says: "MACH is an important event for Bowers Group and is particularly

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A cutting-edge development in swarf management

Derbyshire-based sliding headstock lathe supplier, Star Micronics GB Ltd will debut its new advancement in swarf control technology at MACH 2022 following extensive research and development.

Step Cycle Pro (SCP) is the company's latest breakthrough to combat the challenges presented by stringy swarf when processing difficult-to-chip materials such as aluminium, Inconel, stainless steel, copper and plastics.

The Step Cycle Pro system delivers its highly effective 'air-cut' chip-breaking operation by oscillating the X-, Y- or Z-axis in synchronisation with the spindle rotation cycle and can be used simultaneously on both the main and sub spindles. This oscillation cutting method increases production efficiency by eliminating machine stoppages related to swarf entanglement and enhances tool life by reducing the temperature of the tip whilst in operation.

Developed to suit a variety of machining types including turning, drilling, facing and

grooving, Step Cycle Pro offers a dedicated interface on the FANUC CNC system that allows engineers to easily select the ideal program conditions and chip length from a database of recommendations. The technology does not require any unique skills to operate and can be easily activated or deactivated with a single line G-code command.

As commonly found with other makes of CNC lathe, a small increase in cycle time is to be expected when utilising similar air-cutting functions. However, the advanced system developed by Star can automatically adjust the actual feed rate when the function is enabled to ensure that cycle times remain unaffected and maximum output can be achieved.

Alec Warner, operations manager for Star GB, says: "While our High Frequency Turning software remains popular, Step Cycle Pro provides the synchronised oscillation cutting and air-gap necessary to break the swarf on softer materials. The Step Cycle Pro command is easy to insert into



your NC program, as the control automatically calculates the recommended coefficients for the chip length and amplitude based on the specified RPM and feed rate. All new machines are mechanically equipped to withstand the increased load associated with oscillation cutting. This enables customers to trial the function in 'setting mode' before they purchase the option on a permanent basis."

Star Micronics GB Ltd
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www.stargb.com

Hall 19 - Stand 330

Unison to showcase significant speed enhancements and new entry level tube bending machines

Unison Ltd, the inventor of ultra-precise, all-electric CNC tube bending machines, will be presenting a number of new technologies at MACH 2022 to help manufacturers and subcontractors accelerate their efficiency and productivity as demand returns to pre-pandemic levels.

On show and operational on its stand will be an all-electric Unison Breeze 16 mm, maximum tube diameter, multi-stack tube bending machine, equipped with the company's newly upgraded Unibend control, an operating system providing speed enhancements in the region of 25 percent when bending at full power.

There will also be a Unison EvBend 1000 high-precision machine developed to reduce the entry cost to precision rotary draw tube bending by combining manually-operated feed, tube rotation and bending force, with CNC-controlled braking on the carriage feed, rotation and bend arm axes. Ideal for prototypes and one offs, the EvBend 1000 is widely used in the Formula One and aerospace industries.

Additionally, for organisations that do not

typically require the high levels of versatility and rapid setup times offered by Unison's Breeze range but aspire to owning a Unison tube bending machine, there will be the opportunity to get the lowdown on Unison's newly launched range of Synergy HBM (hybrid, multi-stack) machines.

Unison Ltd offers more than 30 advanced, all-electric tube and pipe bending machines for diameters ranging from 4 mm, 5/32", to 275 mm, 10" schedule pipe, with each model delivering rapid setup, fast tool changes, exceptional power, rigid mechanical design and all-electric control for right-first-time repeat subcontract work or immediately after producing a single trial part. These are all attributes that Unison Ltd believes make its Breeze models the ultimate tube manipulation machines for businesses specialising in small batch production runs.

Available in 50 mm and 80 mm versions from launch, Unison's new Synergy hybrid range combines electric and hydraulic operation. Just like Unison Breeze machines, each model benefits from



exceptional power and rigid mechanical design. As with Breeze models, bend arm, carriage, plane of bend and carriage side shift are servo driven, while mandrel, pressure die and clamping system are hydraulically controlled. This makes Synergy machines well-suited to high volume, repetitive tube manipulation operations that don't require the rapid setup times and all-electric control provided by Breeze machines.

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Hall 6 - Stand 630

Reach for the stars with an engineering career

The image of Cornwall being all beaches and pasties couldn't be further from the truth, as the county boasts a burgeoning high-tech manufacturing sector, with aerospace, medical marine and satellite communications sectors leading the way. This means there is a growing demand for skilled engineers and the South West Institute of Technology facility located at Truro and Penwith College's Truro campus is investing to meet that need. A recent £7.2 million investment has created a dedicated facility that includes an extensive machine shop equipped with multiple XYZ Machine Tools. The facility will provide training in CNC machining, toolmaking, mechatronics, fabrication and welding, taking students to HNC Mechanical and manufacturing Engineering, BTEC and the new T-Level technical-based qualification developed to ensure that the skills developed meet the needs of industry while ensuring the student is prepared for the work environment, with an end-point assessment ensuring these criteria are met.

"There is a huge demand for skills in the region and as a training provider we have to be able to deliver those skills. Therefore, our first job was to modernise the workshop, in fact we built a brand-new facility. We then had to get rid of all of the stereotypical equipment and bring in the right machine tools to develop the skills of our students," says engineering lecturer Andy Foulks.

"XYZ Machine Tools have bent over backwards in terms of the support that they have provided, from initial quotation through to machine installation and ongoing training and support. They are certainly



customer focused when it comes to the education sector with nothing being too much trouble. Our students are also welcomed at the factory for visits and additional insights and training on machines. Our role is to ensure that we keep up with industry requirements, hence the investment in CNC machinery."



At the heart of the workshop is a selection of 21 machines from XYZ Machine Tools, ranging from the manual XYZ 1530VS trainer lathe and XYZ 2000 knee mills with digital readouts through ProtoTRAK controlled mills and lathes and a XYZ 660 HD vertical machining centre. Andy Foulks continues: "With the facility we now have we can focus all our energy on the students and apprentices to ensure that they are ready to add value for their employers. We have a lot of high-end, high-technology, companies in Cornwall and we strive to provide them with apprentices that can enhance their businesses."

With this array of XYZ machines available, the apprentices can make a natural progression throughout their time at the college. Furthermore, as part of the new apprenticeship standards they are working towards achieving the most up to date apprenticeship in the engineering sector. Adding greater interest, the college is working alongside the Spaceport Cornwall, which is collaborating with other aerospace organisations, including Goonhilly Earth Station, Cornwall Council and Virgin Orbit, to deliver the UK's first satellite launch from

Cornwall in 2022. Along the way, Truro College apprentices will be given the opportunity to be involved in machining prototype parts for the satellite.

Truro and Penwith College has extended its connection with space and aerospace by creating the Cornwall Space and Aerospace Technology Training Project (CSATT), which is the first dedicated space training centre in the South-West, that will provide training opportunities for people in Cornwall covering apprenticeships through to foundation degree level courses.

"Projects such as this ensure that the time spent at college is a pleasure, not a chore and having the wide choice of machines from XYZ Machine Tools allows our students to develop their own projects, confidence and skill levels," adds Andy Foulks.

Nick Tillyer, engineering team lead, who had previously worked with XYZ to develop training facilities at Truro College says: "XYZ has proven to be a reliable and collaborative partner to work with. The consistent support



coupled with solid advice and guidance had been critical to delivering our new facility. This is the second time XYZ have pulled out all the stops for us and I am looking forward to continuing our excellent working relationship, with our new engineering and STEM centre in Bodmin due for completion in Q2 2022."

XYZ Machine Tools
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www.xyzmachinetools.com

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Super Mini machines from Ajax at MACH

Ajax is excited to bring its new range of Super Mini machines to MACH 2022. The range starts with the AJAT210 ATOM CNC lathe that is on wheels and can plug into a normal 3-pin 240V plug offered with an automatic 4-way tool post, 100 mm 3-jaw chuck and a Siemens 808D CNC Control which is a fantastic starter machine.



Also new to Ajax is the AJAT320 ATOM CNC Lathe. Available in single phase and three phase, this machine has a 150 mm 3-jaw chuck and a 4-way automatic tool post with the option of a 6-station turret and a Siemens 808D or Fagor 8058 CNC control. To complete the range, the AJAT360 ATOM CNC Lathe is available in single phase and three phase. This machine has a 200 mm 3-jaw chuck and a 4-way automatic tool post with the option of a 6-station turret and a Siemens 808D or Fagor 8058 CNC control and will be exhibited with a Fagor 8058 control. These lathes have been developed over the past three years by Ajax to fill a hole in the market.

Ajax will also present its milling options, which start with the AJPR220 PROTON Milling machine, again on wheels, that can plug into a normal 3-pin 240V plug with a Siemens 808D control as a great starter machine. The AJPR350 PROTON, available in single or three phase, will be exhibited with an 8-station ATC, 100 mm 4th axis, Siemens 808D CNC control and a tool setting probe all for £37,950.00. Last but not least, the AJPR400 PROTON is available in single or three phase 10-station ATC and tool setting probe and again the Siemens 808D control will be on show.

All these machines are designed to bridge the gap between hobby home use and full engineering, using high quality parts from NSK spindles, Hi Win Linear Rails and TBI Ballscrews directly driven and all automatically lubricated.

All machines will be available and running with Ajax staff able to help you with their expertise

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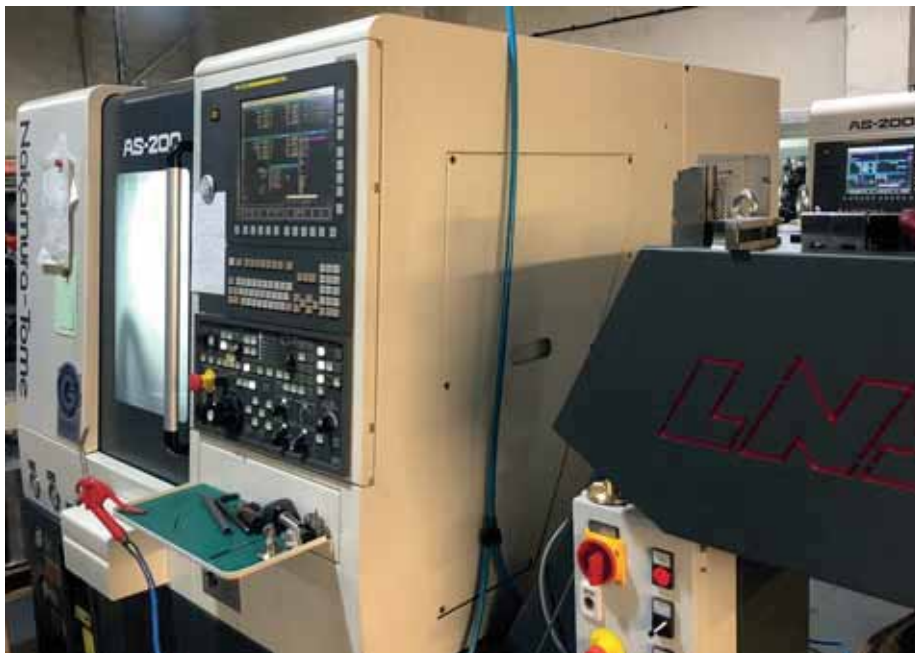
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Productivity flows for Riverside

As a subcontract machine shop, Riverside Precision Engineering Ltd provides round-the-clock one-hit machining for a range of industry sectors. When the company recently noted an upturn in business, it bought not one but two Nakamura turning centres from the Engineering Technology Group (ETG).

With a range of sliding head turning centres machining components for the hydraulic, medical, brewing, valve, marine, rail and oil and gas industries, the Blackburn company was utilising an ageing Nakamura WT250 turning centre for components beyond the diameter capacity limits of its sliding head machines. To increase capacity and improve machine utilisation, the ISO: 9001:2015 certified company reviewed the market and decided to purchase a Nakamura AS200L and a Nakamura AS200 turning centre. Both were delivered in November, just three weeks after ordering the machines from Wellesbourne-based ETG.

Founded over 31 years ago, the 13-employee business made its first venture into CNC machining in 2002 and this was rapidly followed by volume machining on sliding head turning centres. For components beyond the diameter realms of sliding head centres, the company has a variety of fixed head single and twin-spindle turning centres. The Nakamura WT250 has been a stand-out performer over the years.



However, the reliability and utilisation of a Nakamura WT250 that is over 20 years old in a machine shop that demands maximum uptime, is something that needed addressing.

Riverside director, Scott Whalley recalls: "We have several older fixed head machines from a variety of leading manufacturers, but the Nakamura WT250 has held tolerances and repeatability better than any other down the years. We reviewed the market and we picked the Nakamura AS200 and

AS200L from ETG for several reasons. Firstly, we had first-hand experience of the quality, longevity and performance of the brand. Secondly, was availability. ETG had machines in stock and within three weeks, the two machines were on the shop floor and running. Equally important was the cost of the machines. We could have had cheaper machines on a comparative lead-time and similarly, we could have had larger machines at a lower cost. For us, it was investing in quality at a competitive cost for the long-term future of our business."

The mix of machines was also an important factor for the manufacturer of chain and conveyor components and gas and water fittings. As Scott Whalley explains: "Components in the 50 to 65 mm diameter range that are beyond our sliding head machines have been an issue. We have a lot of small-batch work typically from 50 to 500-off that is relatively simple to produce, for this we bought the Nakamura AS200 single-spindle chucking machine. For the more complex work in the 300 to 2,000+ batch range, we bought the barfed twin-spindle Nakamura AS200L. This gives us the perfect blend of capability, flexibility and capacity for our business. We have the AS200 chucker machine manually loaded with billets and the AS200L runs unmanned with a barfeed for longer batches."

Like most subcontract manufacturers that want to maximise every inch of their floor



space, Riverside is no different. "We have 19 CNC machines at present and space is at a premium. The two new Nakamura machines have fitted into the floor area of the old Nakamura WT250, giving us two machines in the space of one. Both of the new machines are faster, more productive and can retain maximum uptime, unlike the old machine. We are now looking at replacing some of our other large ageing machines with new Nakamura machines from ETG. The beauty of the new acquisitions is that they provide very similar capacities inside the work envelope, but the machine footprint is far smaller. It's like having two machines for the price of one."

Maximising productivity

Despite the new Nakamura machines only being operational for a matter of weeks, the benefits are evident. Scott Whalley continues: "The cycle times on the new Nakamura machines are much faster than our other large-capacity turning centres. In fact, the single spindle Nakamura AS200 chucking machine is faster than our ageing twin-spindle machines. The cycle times on both Nakamura machines are much faster, there is less idle time and the kinematics

ensure less 'air cutting'. The rapid rates are faster and the machines react a lot quicker than our other machines. As a business, we are extremely busy at present and our larger components up to 65 mm diameter was a bottleneck. The new Nakamura machines have cut lead times from six weeks to just three weeks on these larger parts."

The stability and precision of the new Nakamura AS200 and AS200L have also been a revelation for Riverside. Scott Whalley continues: "With our old Nakamura and some of our existing older machines, we have to take a trial cut before undertaking production just to ensure the machine and the tools are all set correctly and there is no deviation between the machine settings and the actual parts. This is not the case with the new Nakamura AS200 and AS200L machines. They are much faster to set and the probes ensure all parameters are correct, so we have 100 percent confidence the parts are correct every time without trial cutting or additional re-setting of parameters."

"The guys on the shop floor really like the new machines. As well as being faster and more productive, the CNC control system has a graphic interface that is very intuitive

and user friendly. Combining the new CNC interface with the simplified setting of tools in the work envelope, the team are much more confident using the new Nakamura's.

"Despite being far more productive than our older and larger machines, the new Nakamura's draw significantly less power. We can immediately see that the machines are drawing less kVA than larger machines and two machines are now drawing less power than one older machine."

Scott Whalley concludes: "Overall, we have been delighted with the service, support and training that we have received from ETG. As for the Nakamura machines, we knew we were investing in a quality brand, but now the machines are on the ground and running, the performance is making a huge difference to our business."

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EROWA takes the pressure off turbine blade production

At South Korean aerospace component manufacturer, Hana ITM Co, an EROWA Robot Dynamic 150L has helped the company increase its global competitiveness by reducing its non-conformities by 30 percent, while also keeping employee numbers under tight control.

Established in 2003, Hana ITM's impressive headquarters is located in Gimhae-si on the south-eastern coast near Busan, South Korea's second largest city. Here, the core business is the production of aircraft and gas turbine components and alongside chip-removing machining, the company also operates sink and wire EDM machine tools. The materials that are machined include nickel, cobalt, premium steel, and various aluminium alloys with workpiece up to a size of one metre in diameter.

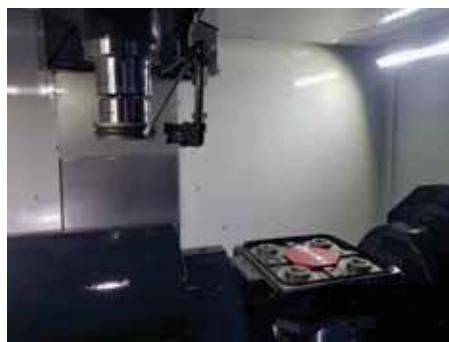
Originally the company focused on honeycomb seals and shrouds for gas turbines, but then it developed a new process for the production of low-pressure turbine nozzles. CEO Steve Yoon played a key role in the development of the new process: "It's a 5-axis CBN creep-feed grinding process. The workpieces are Low-Pressure Turbine (LPT) guide vanes. Our process machines the nozzle components that are needed for this part. In contrast to classical grinding, the process has the advantage that a grinding wheel is used in which a great deal of material can be removed without burr formation, resulting in larger cutting depth. Also, the process is faster, and we get a good surface quality. The grinding wheel consists of diamonds and Cubic Boron Nitride (CBN), which is one of the hardest known abrasives. We need this, because the workpiece material is highly resistant since it has to withstand extremely high temperatures."



It was a very difficult process to develop as Steve Yoon explains: "It was a big challenge for all of us at Hana ITM. We developed, tested and re-adapted intensively for two years and the entire solution required substantial investment.

"Of course, there are countless ways of machining turbine nozzles and the methods vary from company to company. The machining technology of 5-axis CBN creep-feed grinding provided the break-through for the efficient grinding of the radial grooves of turbine nozzles. We are very proud of what we have achieved, we are the only ones in Korea who are able to do this. It was also a very crucial step that the machine producer Doosan modified its DNM350 5ax with special grinding equipment for us. This machine tool is really a milling machine, but we use the machine for this creep-feed grinding process."

Today, an automated production cell that consists of 10 of the modified Doosan DNM350 5ax are supported by an EROWA Robot Dynamic 150L. "Once stable, automating the process was the next logical step. The whole cell is 25 m long and the EROWA robot serves five machines on each side. Added to this, there are two loading



stations, and after the machining process, the parts are washed and checked on a Coordinate Measuring Machine (CMM)," says Steve Yoon.

"This setup has proved extremely successful. We were able to reduce personnel expenditure by 75 percent while reducing non-conformities by 30 percent and this with a simultaneous increase in production agility. I can say that we have achieved our objective."

The project to automate the production cell started in early 2020. However, it is not only the robots and loading stations that are from EROWA, the universal UPC workpiece tooling system that has been installed on all machine tables was also supplied by the Swiss automation specialist. Along with the JMS 4.0 process control system, which Steve Yoon states also makes a crucial contribution to success operating in the background: "It provides us with all the production data and a comprehensive overview of the workflow at all times. The washing machine and the measuring machine are also integrated in the process.

"The entire system is very agile and flexible but, with 10 creep-feed grinders working together, we have the capacity to meet major orders. Our customers from the aerospace and gas turbine sector are international players, including B/E Aerospace, part of Rockwell Collins, Sukhoi

Civil Aircraft of Russia, Hanwha Aerospace Korea with end customers GEAE and Pratt & Whitney and many others. To be globally successful, you must be competent but also competitive with regard to quality, technology and cost. In addition, you must have the necessary certifications; in our case, AS9100, the international standard for quality management systems of the aviation, space and defence industries. We also have NADCAP accreditation, a standard of the aviation industry for special processes and special products; this is about the highest degree of process control."

Hana ITM has further plans for automation in the near future. "We intend to carry automation even further," Steve Yoon



concludes. "This can be an option in a wide variety of areas, in grinding, milling, EDM and so on. At present, we are very hopeful of being awarded a new project and that could very well be the next project for EROWA."

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Starrag's quality and precision components take F-25 fighting jets to incredible heights

Stealth and supersonic: these are two attributes of the most dominant and complex military combat fighter jet in the world - the F-35 Lightning produced by Lockheed Martin. These words also describe the ultra-precise capabilities of Starrag's manufacturing machines, with more than 60 Starrag installations involved in the creation of each F-35.

It takes a single pilot to manoeuvre the \$100 million jet, but it takes thousands of Joint Strike Fighter (JSF) partners to construct the F-35 to ensure that pilot has the most superior fighter apparatus in the world. Starrag is one of those partners, with its machines producing a wide range of JSF specialised components from steel, aluminum and titanium.

"It's heart stopping when you attend an air show or are at a stadium when the US military conducts a flyover with the F-35," says Starrag chief sales officer Alexander Attenberger. "We swell with pride knowing that Starrag plays a role in the JSF program, which is planned to continue for possibly another 50 years."



The first F-35 flight launched in 2006 and Starrag's involvement with the programme had begun in the early 2000s when it worked with a UK-based customer on titanium parts.

Starrag previously had developed tailored machines for machining parts for other aircraft for this customer and other manufacturers.

"Starrag's extensive experience of machining titanium was extremely competitive, particularly in regard to tool costs, which are the largest ongoing life cycle costs of machining," says Starrag managing director Dr Bernhard Bringmann. The joint work and developments soon evolved into Starrag's Big Titanium Profiler (BTP)

machining centre with pallet sizes of 5,000 x 2,000 mm to accommodate the machining of stringers. Today, 23 BTPs are in production factories in the UK and Australia.

With 1,000 Nm twin spindles and a tool magazine with more than 400 pockets, the BTP 5000/2 simultaneously mills titanium tail fin components of 700-800 mm width and just 50 mm thick to tolerances within 30 µm and to surface finish qualities of Ra 1.6, for 5-axis tasks and Ra 0.8, 3-axis. To ensure those demands are consistently met, Starrag's quality turnkey solutions include the construction of a machine foundation 2,000 mm deep to ensure sufficient stability.

Even the earliest machines installed are continuing to hold the specified volumetric tolerances, in some cases maintaining 50 microns across the machining envelope with ranges that extend to 4,800 x 3,000 x 1,500 mm. "With our ongoing support, there is no reason why our JSF customers shouldn't continue to maintain such high accuracies day in and day out for the next five decades," says Bernhard Bringmann.

He adds: "For every machine and Flexible Manufacturing System (FMS) we provide, we work very closely with the customer to provide the perfect machining solution to achieve the best quality and cost-effective end result."

The impressive capabilities of the Droop+Rein FOGS overhead gantry-type 6-axis machining centres are also utilised for JSF work, not only for high-speed finishing



of dies, but especially for the fixed, fork-type heads with 300 Nm spindle. Starrag continuously developed its revolutionary FOGS models to efficiently rough machining a range of steel and titanium F-35 components using a variety of heads. The 6-axis Droop+Rein is the only one of its kind in the world.

Carbon fibre is another material in Starrag's machining portfolio, in one case involving an FMS based around FOGS machines housed in a large, temperature-controlled building. The FMS accommodates certain panel configurations that need surface milling, routing and drilling in a single setup before being cleaned and passed to an integrated Coordinate Measuring Machine (CMM). The workpieces sit in fixtures on pallets that are moved under constant vacuum to the inspection machine.

In addition, the FMS features enhanced control software. Starrag's kinematic management system enables the FOGS machines to hold tolerances of 50 microns over their entire 4,800 x 3,000 x 1,500 mm working envelope while cutting in fully interpolative 5-axis mode. Initially established with five machines, the FMS now has nine machines served by a 90-pallet Fastems system.

Starrag's workable concept of the interchangeability of machined parts was also borne from the JSF program. With parts being manufactured from around the world,

the JSF programme required that all of them meet very stringent tolerance specifications for interchangeability in the jets. Starrag, which had similar accuracy specifications to meet the production of the Eurofighter Typhoon jet, was successfully able to meet those stringent interchangeability standards. Initially supplying a tailored horizontal machining centre, Starrag added volumetric compensation routines to a standard FOGS model to complete these complex tasks.

The combination of Starrag's expertise and the input of the customer's accumulation of knowledge from its business standpoint is what creates optimised production solutions. In addition to machine build quality, this ongoing quest also involves CNC software, fixtures and workholding, as well as tool design and development. "Our solutions not only have to provide immediate results in terms of lowest cost-per-part at the expected quality level, but they also have to sustain over the

lifecycle of the part," says Bernhard Bringmann. "In JSF's case, this could mean another 50 years."

About the JSF program

The F-35 Lightning II is an American family of single-seat, single-engine, all-weather stealth multi-role combat aircraft. It is being manufactured in three main variants: the conventional take-off and landing F-35A; the short take-off and vertical landing F-35B and the carrier-based F-35C. The aircraft descends from the Lockheed Martin X-35. Lockheed Martin is the prime contractor, with principal partners being Northrup Grumman and BAE Systems. The US, which is the primary customer and financial backer, plans to buy 2,456 F-35s through to 2044. The aircraft is projected to operate until 2070.

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AE Aerospace improves its operations with MSC Industrial

Midlands-based manufacturer, AE Aerospace is increasing capacity and productivity through the implementation of lean and efficient processes, as part of a five-year contract with MSC Industrial Supply Co. UK.

As a machine to print manufacturer, AE Aerospace supplies the aerospace, defence and marine industries, manufacturing prototype components through to original equipment and legacy parts. AE looked at products other manufacturers won't, components that haven't been made for decades, that will have been made on older machines. AE specialises in recreating these items, using modern tooling, in a very fast turnaround but to do that the business needs stability of supply and support.

Ian Bouquet-Taylor, operations director for AE Aerospace, comments: "Our stability comes from good planning, but it also comes from working with people like MSC who help us to focus ourselves. By having less problems around tooling and knowing

what tooling we get on a day-to-day basis, we're able to pass that stability and assurance onto our own customers."

AE was struggling with having the right stock on site because of its ever-changing order book, making it difficult to plan ahead for the tooling required. By using MSC's ControlPoint vending solution, which has a whole range of tooling in there, AE benefits from having the correct tooling on hand for those emergency jobs that come up.

AE also takes advantage of MSC's in-house engineering support. MSC's engineering team are constantly plugged in with the team at AE, working on MPI and CI projects, and combined the engineering support and vending service together really help drive efficiency improvements in both production and in the purchasing department as well.

Rob Smith, technical sales engineer for MSC, says: "We're set up to help businesses succeed. Whether it's using data to boost performance, building resilience and



flexibility, or winning new business, we operate in a way which allows us to help businesses.

"In the next five years AE is planning on increasing significantly so, to support this, we have started by looking at machining processes and operational efficiencies within the business itself to get to the point where they're efficient and they can potentially run unmanned."

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Latest deep hole drill technology allows Midwest Precision to deliver on its reputation and its name

A collaboration between the Wisconsin-based deep hole boring specialist and Sunnen Products Company resulted in a deep hole drilling system that delivers quick turnarounds, precise parts, and remote diagnostics to reduce downtime and support steady workflow.

With a reputation for quick delivery times and the word "precision" in its name, Midwest Precision has a lot to live up to when it comes to deep hole drilling. The Fredonia, WI-based company has specialised in tight-tolerance deep hole bores for almost 30 years, but it was with an eye to the future that Midwest partnered with Sunnen Products Company to develop the next generation of deep hole drilling systems. The collaboration, with upfront voice-of-the-customer design input from the team at Midwest, led to a deep hole boring solution that is versatile, efficient and reliable, producing parts that are straighter and more accurate than the shop's older drilling machines. The new Sunnen model SHDD-4500 deep hole drill installed at the Midwest facility produces straight,



tight-tolerance parts on a variety of materials, allowing Midwest to meet turnaround times and keep a variety of parts moving through the shop. However, the biggest advantage is the ease of programming and operating the system, so operators are able to turn out precision parts with minimal training.

Midwest was started by Bob Bublitz in what was basically a garage located in Fredonia back in 1993. Beginning with a single gun drill producing parts for regional customers, Midwest has grown to 30,000 sq.ft. of floor space and 24 employees. The company specialises in tight tolerance drilling services, including deep hole boring, precision gun drilling, and precision honing. Typical workpieces have bores with ID's from .062 to 9.5 inches,

some up to 144 feet in length. The shop has a number of older deep hole drills that handled the bulk of its long cylinder work, but they wanted a system that is easier to program and operate. With two Sunnen hones already in the shop, the two companies were familiar with each other and, in a case of good timing, Sunnen was developing a new deep hole drilling system, having acquired deep hole tooling company BTA Heller in 2018.

"We were looking to add a more reliable, consistent drilling machine and Sunnen approached us with the opportunity to share in the design of an all new system," says Jason Bublitz, operations manager at Midwest Precision. "From a business perspective, our challenge is maintaining a steady workflow. We're a contract shop for



Left to right: Chris Braby senior team leader and the machine operator, Tom Huiras general manager and Jason Bublitz operations manager at Midwest Precision



a lot of different industries, so machine downtime has a big impact on overall operations and our ability to meet delivery times.”

The Sunnen team consulted with Midwest on all aspects of the new machine design, servo-driven ball screws for tool feed, heavy-duty linear rails and high capacity coolant system, among others, but also developed an advanced control system to simplify time-consuming machine setup and training. The intuitive control makes part-programming easy, and connectivity with Sunnen allows the team at Midwest to keep production moving.

“The advantage of getting real-time assistance remotely, to diagnose an issue or help produce a new part, is a great benefit,” adds Jason Bublitz. “We were able to sustain business through the COVID months due to our versatility to produce parts for



a variety of markets and deliver them on time.”

For Tom Huiras, general manager of Midwest Precision, the reliability of the new drilling system goes deeper than smooth daily operations it protects the company’s reputation: “We built this business on our ability to turn parts around quickly, sometimes less than a week and our customers depend on us to meet their deadlines.” A machine drilling veteran who started at Midwest as a machinist, he is now a part-owner. “The machine must be running, and producing parts to-spec or we’re not delivering on our reputation,” he adds. “The speeds and feeds of this new drilling system, as well as the accuracy, make it an integral part of our operations. We put mostly Inconel, titanium, 4140 and 8620 alloys through it and achieve the precision demanded by our customers in the time they expect. That means we’re pushing

speeds and feeds, but it’s accurate at any hole size. We used to easily tell which end of the part was the entrance and which the exit. But, with the new machine we can’t tell the difference.”

Chris Braby, senior team leader at Midwest, played a large role in the design of the new system as he brought the shop-floor perspective to the process: “Older drilling systems require a degree of operator expertise and that takes a lot of training. The ease of set up and programming is important because we’re not limited to having just a few qualified operators on staff. We can train a new operator on this system in a matter of hours versus weeks with older systems. The collaboration with Sunnen led to a great design and it continues every time we get a new part challenge.”

The Sunnen team welcomed the input from the field. “To paraphrase an old saying, we ‘walked a mile in their work boots’ to create a drilling system that handles high-capacity production and reduces machine setup and changeover time,” says Phil Hanna, machine product manager at Sunnen. “The versatility of a deep hole drilling system that can handle solid drilling up to five inches, and counterboring or trepanning up to seven inches diameter, demonstrates our commitment to develop the best deep hole system on the market.”



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Deep hole drilling demands precise coolant control

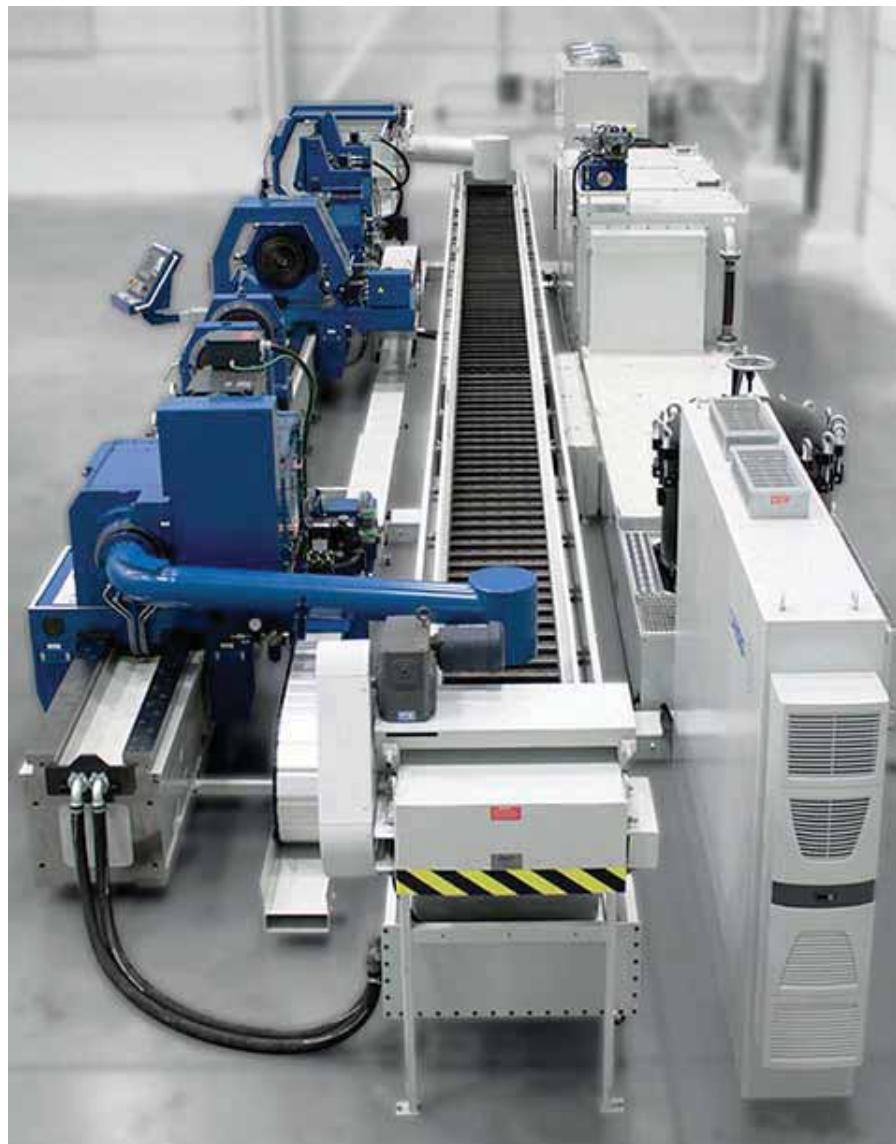
Coolant is so critical to the deep hole drilling process that today's state-of-the-art systems control it much the same as they would a machine's spindle or axes. Careful management of coolant pressure, filtration, temperature and flow rate is key to optimizing deep hole drilling processes. This requires programmable, infinitely variable flow-based control capability integrated into the deep hole drilling machine itself. The result is a system with the adjustability necessary to ensure there is never more pressure in the coolant system than is required for effective chip evacuation and precise drilling.

For many years, the most advanced coolant delivery system beyond flood types were through-spindle/through-tool coolant systems. Then the advent of high-pressure coolant systems operating at around 1,000-plus psi changed the coolant technology landscape with especially effective tool cooling as well as efficient chip evacuation for most conventional machining operations. Drilling applications, mainly those using twist drills, were a main driver of the development of high-pressure coolant systems, in particular deep hole drilling applications where depth-to-diameter ratios are typically 10:1 and beyond.

Deep hole drilling machine OEMs such as UNISIG will engineer coolant systems, as well as controls into the design of a machine to ensure integration as well as performance consistency.

However, as coolant pressures increase, so too does the need for proper filtration and temperature control. When considering 1,000-plus psi systems, 20- to 50-level filtration is needed to keep pumps from failing, and in most instances, high-pressure coolant systems will require a chiller to regulate coolant temperature. While most shops stop with these systems, even for demanding drilling applications, filtration and coolant alone fail to address one of the most important variables in high-pressure coolant use, which is flow rate.

Shops often have no idea how much coolant their system delivers or should be delivering. Typical flood coolant systems, for example, provide about 10 gpm to around 40 gpm flow rates, depending on the



system. However, much higher volumes are needed to evacuate chips in drilling operations as holes become larger in diameter and/or deeper. When using larger gundrills or BTA tooling, for instance, the required coolant flow can range from 50 gpm to upwards of 75 to 350 gpm for hole diameters as big as 10 to 12", 25.4 to 30.5 cm. Conversely, flow rates for small diameter deep holes may need to be only 2 gpm but with much higher pressure levels. A 0.040", 1.016 mm, diameter hole, for example, might require coolant pressure as high as 3,000 psi.

Because there is an exponential factor involved, when hole diameter increases

slightly, area/metal removal increases significantly. Consider the difference between a 1", 25.4 mm, diameter hole and a 1.5", 38.1 mm, diameter one: a 50 percent increase in diameter. The resulting area amounts to 0.79 in³, 12.95 cm³, for the 1" hole versus 1.77 in³, 29.01 cm³ for the 1.5" hole, a 100 percent increase. Doubling the hole diameter from 1 to 2" equates to four times more area and four times more material to evacuate out of the hole. In other words, shops should assume that even a slight increase in hole diameter will warrant a change in coolant parameters.

Despite this, most coolant systems offer very little flexibility. Flood coolant systems,

for example, have no flexibility at all. The coolant is either on or off. Through-spindle coolant systems may include relief settings or M codes that provide low-, medium- and high-pressure settings, but these are insufficient for shops that need truly optimised coolant delivery.

Enter infinite variability coolant control. This technology allows shops to start a hole at perhaps 400 psi, then as the drill progresses deeper, increase that to whatever level is needed to maintain flow rate for effectively evacuating chips. However, this is a difficult process to dial in manually. If a flow rate is too low, chips will remain in the hole and could eventually break the drill. Too much flow can create excessive pressure, which, in turn, generates unwanted forces that can hinder drilling accuracy.

For successful and consistent performance, deep hole drilling machine OEMs such as UNISIG will engineer coolant systems and controls into the actual design of a machine from the start to ensure complete integration. This allows controls to provide immediate in-process feedback for extremely granular levels of coolant adjustability that put exactly the right

amount of coolant at the cutting edge at all times.

The system works by implementing process feedback in the control system, which makes immediate coolant adjustments to prevent tool breakage. The feedback from the control also guides operators in optimising deep hole drilling coolant flow and pressure and once these parameters are determined, they can be used to repeat the process over and over.

Additionally, coolant pressure and flow feedback from the process itself is used to detect broken tools. For instance, if the application's coolant pressure suddenly drops, that can indicate a broken tool and, right at that moment, the process can be stopped and the tool replaced. This is especially useful when drilling extremely small-diameter holes where the lighter drill loads make even a slight change in force difficult to detect. By monitoring coolant, operators can determine the health of the tool and whether or not chips are being evacuated. It can help further optimise parameters such as feeds and speeds for better chip control in those instances.

In addition to coolant systems and controls, coolant reservoirs are also

specifically engineered for deep hole drilling machines by OEMs like UNISIG. While flood and through-spindle coolant systems for machining centres might have 20 to 50 gallon coolant reservoirs, those with deep hole drilling systems will vary to accommodate the speed and flow of the coolant. Depending on the size of the deep hole drilling machine, coolant reservoir capacities can run up to 3,000 gallons and be paired with a 350 gpm capacity filtering unit.

Flood through-spindle and high-pressure coolant systems do make the occasional high-performance drilling operation possible on conventional machining centres. However, when drilling operations are performed every day and involve much deeper holes at 10, 20 or even 40:1 ratios and beyond, a dedicated deep hole drilling machine is needed. The best types are those engineered with the coolant system as an extension of the machine, much like a spindle or axis is part of the machine.

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CERATIZIT has something for everyone at MACH 2022

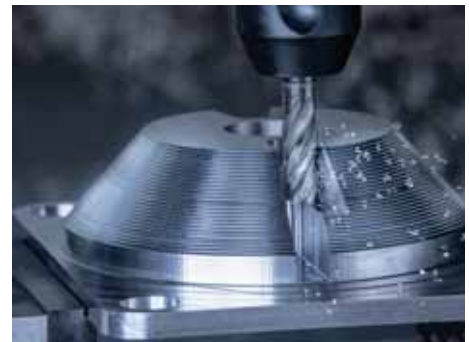
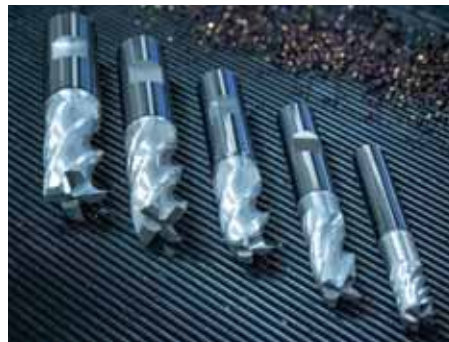
With its four competence brands of CERATIZIT, WNT, Komet and Klenk, there is never a shortage of new developments from CERATIZIT UK & Ireland. MACH provides the ideal opportunity to showcase a selection of the cutting tool and workholding advances that have taken place recently.

If turning inserts can be described as intelligent, the new CTCP115, CTCP125-P and CTCP115-P grades developed for the machining of ISO-P grade steel are that. At the end of its life, the performance of an insert deteriorates and, if not spotted, can fail with expensive consequences. Therefore, being able to identify when end-of life is being reached is a major advantage. CERATIZIT has integrated a new indicator layer into the special multi-layer Dragonskin tool coating, which highlights when the tool life is close to its limit, something that with the Tin, Al₂O₃, Ti(C,N) coating, can be extended by up to 20 percent.

The three new grades also simplify the selection of the right insert for what can be a wide array of materials falling within the ISO-P steel designation. In their design, these inserts have had every element rethought, from the substrate to the geometries and through to the coating to provide just three choices for the optimum machining experience and enhanced tool life. The choice now is simply CTCP115-P, ISO P15, especially for smooth cuts with stable cutting conditions and continuous cuts. For general roughing and finishing of ISO P25 steels, the choice is CTCP125-P, whereas for those difficult conditions such as unstable interrupted cutting in the ISO P35 range CTCP135-P is the grade of choice.

Silverline is a range of solid carbide end mills in a variety of styles including Torus-style cutters, end mills with corner radius and standard end mill forms. The latest developments in the range come with the latest Dragonskin coating, advanced cutting geometries that help to deliver even more exceptional performance in terms of metal removal, enhanced cutting data and tool life.

Key to Silverline's success is the optimised core geometry of the cutters which, when combined with the carbide substrate and Dragonskin coating, brings with it, among other things, improved process security, reduced vibration, even with high angles of



contact, greater stability through improved chip clearance, smoother processing and lower cutting forces. With increased choice of flute options, shank styles and cutters for rough, rough and finish and full slot milling, there will be a Silverline cutter suitable for most applications.

The proof of Silverline's improvements comes from customers who are experiencing the benefits of these new developments. In one example, milling stainless steel polygon shafts, the customer stated the following: "The amazing results that we have achieved with the upgrade have far exceeded our expectations." The new Silverline, compared to the older variant achieved between 20 and 40 percent higher cutting speeds, with tool life increasing by up to 40 percent.

The new SGF solid carbide thread milling cutters from WNT are now a standard item from the CERATIZIT catalogue with next day guaranteed delivery.

For those with a requirement to drill holes up to 96 mm diameter, the latest Komet KUB Pentron CS (Cartridge System) indexable insert drill provides the ideal result. This latest addition to the KUB

Pentron range adds to the already well-regarded range covering diameters from 14 to 46 mm, with the new CS variant offering cutting lengths of 3xD. The KUB Pentron CS is suitable for universal use as well as many special applications and is now part of the standard CERATIZIT Group portfolio. The modular design consists of a burnished, wear-resistant KUB Pentron base holder, along with two high-precision cartridge seats. The inner cartridge can cover a specific diameter range, while the outer cartridge determines the bore diameter, with each housing two SOGX indexable inserts from the CERATIZIT standard portfolio, including a range of grades and geometries to maximise tool life and chip control.

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Rainford to introduce new tooling ranges at MACH

The Rainford Precision stand at MACH 2022 is set to be a hive of activity with the micro-machining experts providing a free cutting tool giveaway as well as introducing two new brands to the UK. Rainford has recently been announced as the new UK and Ireland distribution partners for both 6C Tools AG and BSQ Tech GmbH and, as the 'go-to' company for specialist small manufacturing solutions, the innovations will be presented to the UK for the first time at the show.

Unlike many other products on the market, the tools from 6C Tools AG are completely manufactured by laser ablation, a process that is particularly gentle for material removal compared to grinding or spark erosion. This method of manufacture avoids damage and significantly increases the wear resistance of 6C Tools, creating a potential 5 to 10 times tool life increase. The 6C product catalogue covers several drilling, milling and threading tools, as well as tailored tools that are manufactured from PCD and PCBN. Designed specifically for machining the most challenging materials such as ceramics, tungsten carbide, zirconium, sapphire, glass and glass ceramics, the standard 6C portfolio introduces PCD drills, PCD end mills, PCD chamfer tools, PCD ball nose mills and ball nosed polish tools, as well as a range of PCD thread mills.

The ability to machine such difficult materials with impressive tool life and productivity characteristics makes the 6C range ideal for manufacturers in the optical, medical, electronics, jewellery and



semi-conductor industries, to name a few. Like many products in the Rainford Precision armoury, the 6C tools are specifically produced for the machining of small components and features. The standard PCD drilling tool ranges, many with through shank coolant capability, are available in 0.1 mm increments from 0.3 mm diameter to 3 mm in 2XD, 0.3 mm diameter to 2.4 mm in 3XD, 0.6 mm diameter to 1.9 mm in 4XD and 0.8 mm diameter to 1.6 mm in 5XD.

Complementing the impressive micro drill ranges are the PCD corner radius end mills with diameters from 0.3 mm to 3.3 mm and flute lengths from 0.5 mm to 1.8 mm that are available with a choice of corner radii from 0.05 to 0.3 mm. The long-series PCD corner radius end mills are available in diameter increments up to 6 mm with a clearance length of 10 mm. The chamfer tools are available from 1 to 3 mm diameter with 30° and 45° angles while the ball nosed PCD Polish Mills are introduced with a ball radius from 0.05 to 1.6 mm with 2XD and 3XD variants available. These PCD Polish Mills are the ideal complement to the two flute ball mill ranges that can be specified from



0.4 to 1.0 mm diameter in 2XD to 4XD clearance lengths. Completing the 6C Tools line-up at MACH will be the high-performance micro thread mills that are available to cover M1.2 to M2.2 as standard, with various clearance lengths available for the threading of particularly small holes in the hardest and abrasive of materials.

For engineers looking to improve their productivity drastically when machining aluminium, aluminium alloys, copper brass, plastics, PEEK and all other non-ferrous metals, Rainford has a real treat at MACH. The arrival of the SwissCeraMill series from BSQ Tech GmbH can increase tool life from 5 to 25 times and improve productivity by 400 percent compared to conventional carbide cutting tools. To achieve such jaw-dropping gains, a high-speed machine is recommended, but improvements can be achieved with standard machines accelerating performance for manufacturers in the automotive, aerospace, medical, tool and mould and general subcontract sectors.

Manufactured from high-tech ceramic zirconium oxide with a micro-grain structure of 0.3 microns, the SwissCeraMill end mills are available in square end, corner radius and ball nose designations as well as special-purpose tools to suit the diverse needs of industry. The square-end tools are available in diameters from 1 to 20 mm.

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Hall 20 - Stand 573



Floyd to bring new technology to MACH

As an expert in sliding head-turning technology, Floyd Automatic Tooling will have sliding head machines on its stand at MACH from the world's leading manufacturers. The sliding head machines will be completely tooled-up with the latest innovations from the Baldock cutting tool specialists, demonstrating the extensive portfolio available from Floyd Automatic.

Floyd Automatic will be keen to showcase its ever-expanding range of innovations that now include the Swiss cutting tool brand Denitool and also the German JBO brand. Both JBO and Denitool will be making a MACH exhibition premiere and the addition of JBO to the Floyd stable will give the tooling specialist one of the most impressive ranges of thread milling cutters, shell type thread milling tools, threading dies, combination tools, precision thread gauges and more.

Additionally, with Floyd Automatic recently announced as the new UK sales and distribution partner of Denitool, the Hertfordshire cutting tool expert has

available as a standard or as an ultra-precise (UP) variant that can achieve a run-out of 0.003 and 0.001TIR respectively.

Another MACH debutant will be the new Precitronics TOHP Series of driven tooling with integrated high-pressure coolant feed.

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also incorporated a high-performance range of fine boring tools into its portfolio. The Denitool range of precision boring tools is a high-quality line of solid carbide boring bars with a multitude of indexable insert geometries and grades to improve the performance of small part turning operations. This new range of turning and boring tools will strengthen the offering while providing turned parts manufacturers with a new range of tools that complement the already extensive and high-quality product lines available.

Also on show at MACH will be the new Hydro-Swiss Turn range of compact hydraulic clamping tool holders for cylindrical tools. Capable of maintaining precision and run-out levels of less than 1 micron, 'ultra-precise' is now possible for your sliding head CNC turning centres. The new Hydro-Swiss Turn holders are also compatible with all leading sliding head machine brands.

The Hydro-Swiss Turn holders are



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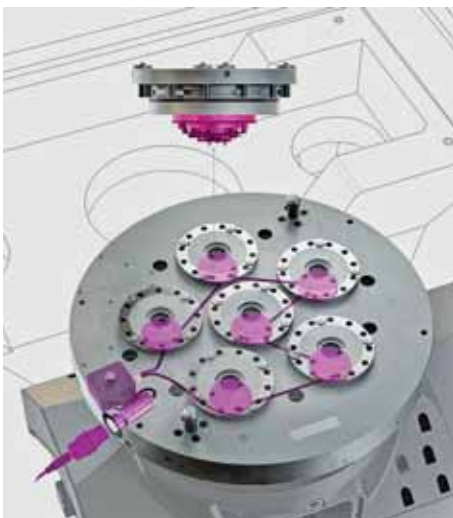
New workholding products to be launched, including for automated production

Sensor-based zero-point clamping

At MACH 2022, Roemheld will show for the first time in the UK a new, modular, sensor-based system that digitalises zero-point clamping by enabling digital recording of its status. STARK.intelligence enables data on workpiece loading and unloading to be integrated directly into an automated manufacturing process. Information is also provided on the condition of the clamping equipment to facilitate its scheduled maintenance.

Each fixture is equipped with its own sensor box to measure position, temperature and pressure in real-time. A master unit receives data from several units and outputs the information to different devices via an IO-Link. The device can be the machine tool's control screen, computers in the quality assurance department or the service engineer's smartphone.

STARK.intelligence can be combined with various STARK zero-point clamping systems and may be retrofitted easily to machine tables and quick-release fixture plates. Due to the modular design, users are able to choose between individual components or a complete solution, which may include the integration of an RFID interface that automatically detects pallets and workpieces.



Compact bore clamps

Another introduction at the show will be a range of compact bore clamps with a large clamping range for five-sided machining.



The devices hold internally, exerting force both radially outwards and downwards against a support surface. The new models enable safe location in bores from 5.2 mm to 13.7 mm, so are suitable for clamping small workpieces. Bore size can be adjusted easily through interchangeable bushings while the clamping element remains in its fixture. Worn bushings can be replaced within a few minutes.

The support height is also easily adjustable to suit workpieces having clamping surfaces at different levels. Air blast helps to keep the bushing clean and ensures reliable operation. It is possible to check if the workpiece is clamped or unclamped, whether it is correctly located and if the clamping bolt is intact, so the devices can also be used in automated applications.

New flat lever clamp

A third innovation at the exhibition will be a compact flat lever clamp designed for use on fixtures in machine tools with low pressure hydraulics between 70 and 120 bar. It complements the successful Roemheld series rated at up to 250 bar. The hydraulic, double-acting element is suitable for mounting in any position. There are built-in and block-type varieties as well as



versions without a housing for installation in restricted spaces.

Due to the flat clamping levers, even surfaces only a few mms above the clamping level can be machined without any problems. Depending on the operating pressure and lever length, clamping forces of up to 33 kN are possible. As with the 250 bar versions in the series, the status and position of clamping can be pneumatically checked.

Machine vices

Roemheld will also show two models from its large range of machine vices. Most flexible is the Hilma VarioLine, which is used vertically or horizontally and may be quickly



adapted to different workpiece sizes due to magnetically-secured, quick-change jaws that can be exchanged in a single action. They can be individually configured using various parameters to adapt them to different machines and applications.

The other vice will be the Hilma MC-P, intended for securing parts during 5-axis machining. It is able to grip on just 3 mm of stock, reducing raw material costs and offering excellent accessibility to the workpiece yet providing precise, stable workholding for completing first and second operations in a single clamping. The compact design enables collision-free tool paths and the use of short, standard tools.

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Hall 6 - Stand 682

which had similar accuracy specifications to meet the production of the Eurofighter Typhoon jet, was successfully able to meet those stringent interchangeability standards. Initially supplying a tailored horizontal machining centre, Starrag added volumetric compensation routines to a standard FOGS model to complete these complex tasks.

The combination of Starrag's expertise and the input of the customer's accumulation of knowledge from its business standpoint is what creates optimised production solutions. In addition to machine build quality, this ongoing quest also involves CNC software, fixtures and workholding, as well as tool design and development. "Our solutions not only have to provide immediate results in terms of lowest cost per part at the expected quality level, but they also have to sustain over the lifecycle of the part," says Bernhard Bringmann. "In JSF's case, this could mean another 50 years."

About the JSF program

The F-35 Lightning II is an American family of single-seat, single-engine, all-weather stealth multi-role combat aircraft. It is being



manufactured in three main variants: the conventional take-off and landing F-35A; the short take-off and vertical landing F-35B and the carrier-based F-35C. The aircraft descends from the Lockheed Martin X-35. Lockheed Martin is the prime contractor, with principal partners being Northrup Grumman and BAE Systems. The US, which is the primary customer and financial backer, plans to buy 2,456 F-35s through to 2044.

The aircraft is projected to operate until 2070.

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Hall 20 - Stand 563

AE Aerospace improves its operations with MSC Industrial Supply Co

Midlands-based manufacturer, AE Aerospace, is increasing capacity and productivity through the implementation of lean and efficient processes, as part of a five-year contract with MSC Industrial Supply Co. UK.

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Hainbuch to show new technology at MACH

Making its premiere appearance at MACH 2022, the new Hainbuch System is a complete gamechanger for manufacturers looking for efficient and flexible workholding. The Hainbuch stand will be crammed with exciting new technology that will make a visit to the Birmingham NEC worthwhile.

The Hainbuch System is a ground-breaking quick-change innovation that adapts to your needs, allowing manufacturers to clamp 1,000 different workpieces without the need for a multitude of solutions. With the Hainbuch System, engineers now only need one basic clamping device, a chuck or a stationary chuck that remains on the machine tool. Whether it is OD, ID, prismatic components, jaw, magnetic or clamping between centres, the Hainbuch System provides a solution without any compromises.

The workpiece determines the adaptation required and converts your basic clamping device for the particular application. This innovative solution reduces setup times substantially, while increasing flexibility and making it possible to easily squeeze in fast turnaround jobs, making sure you are optimally prepared for every clamping situation, whether it is turning, milling or grinding. The Hainbuch System is a new series of mandrels and adaptors that encompasses the complete range of Hainbuch products. This includes the exciting Toplus Premium Chuck. The Hainbuch portfolio of chucks has always been very precise and once the chucks are aligned, the runout is near to zero for repeat clamping. If chuck heads are changed, the runout is usually between 3 to 7 μm without alignment. With the Toplus Premium Chuck, Hainbuch guarantees a runout of $\leq 5 \mu\text{m}$ without alignment, regardless of which clamping head is used. By utilising the new



Toplus Premium Chuck with the associated premium clamping heads and by clamping against the workpiece stop, this level of accuracy is always achieved. This means that manufacturers no longer have to lose time-making adjustments for small batch sizes. This simplifies setups and allows manufacturers to be highly flexible as the new Toplus Premium Chuck is just as accurate as a chuck that is aligned for series production.

Also capable of working in harmony with the new Hainbuch System is the SPANNTOP mini chuck series. The MANDO Adapt mandrel and the corresponding jaw module already work perfectly with the new SPANNTOP mini, meaning complete autonomy for your small component clamping needs.

Unlike the SPANNTOP mini chuck, the configuration for the TOPlus system is a little different. Whereas the SPANNTOP uses an adaptor ring, the TOPlus system has a ring of attachment holes to secure the market-leading jaw module. At MACH, Hainbuch will once again be showcasing the MANDO Adapt series of adapters that work in harmony with the popular TOPlus as well as other leading products in the new Hainbuch System.

The SPANNTOP and TOPlus Mini-Series are offered with a full through-bore plus a variety of standard lengths to suit all machine types and drawtube configurations.

Also making an appearance at MACH 2022 will be the Centrotex quick change-over interface that is now available in a new version for smaller machine spindles. Recognised as the smallest available system for setting up clamping devices in a matter of seconds, the quick change Centrotex S has a diameter of just 224 mm.

The Centrotex S is the perfect solution for eliminating non-productive downtime,



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

Automation is increasingly important to manufacturers and, to this end, Hainbuch will have an automation station on its stand to introduce some of the many new automation innovations that are coming to market soon. This automation station will include the new IQ chuck and IQ mandrel with integrated measuring intelligence.

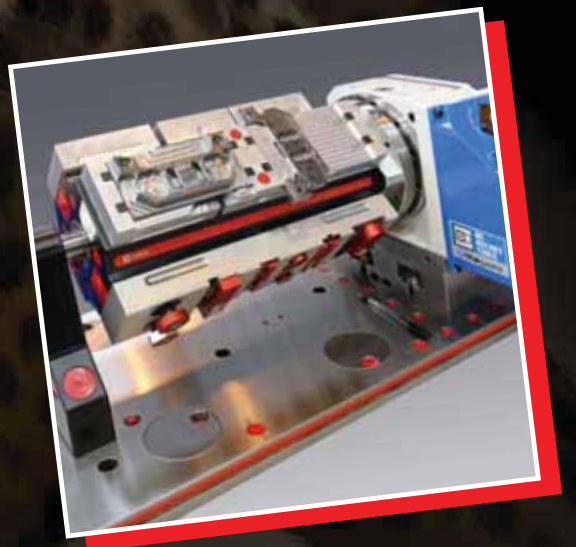
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New generation of clamping force blocks with a wide range of variants

At first glance, the three grooves on the TANDEM KSP3 clamping force block catch the eye, but it is primarily the inner values that set the first product of the TANDEM3 modular system apart from its predecessor. With the new clamping force block portfolio, SCHUNK is replacing the existing TANDEM-plus modular system and supplementing it with variants that have additional technical features. One of them enables the patented monitoring of the base jaw position via dynamic pressure, while another one makes it possible to control the air system through the jaw. Monitoring the position of the jaw or the presence of the workpiece was previously only possible with additional effort. Due to the standard integration, SCHUNK is opening up new fields of application in the area of automated machining.



Highest clamping force, numerous variants

Due to the integrated spring assemblies in the pneumatic vice, it has a higher clamping force than all previous models. If the air supply is disconnected from the clamping force block, the clamping force is maintained via springs. The clamping force block can be used universally in applications where process-reliable clamping through constant and high clamping forces is required, primarily in automated machine loading. With the aid of console plates, it can be quickly and easily mounted on the machine table or the VERO-S quick-change clamping system, thus saving setup costs. It is also ideal for 6-sided machining in two setups. The 2-jaw vice is available in seven different vice sizes and with standard, long-stroke or fixed jaw. A total of 200 different versions are available. The enormous variety of equipment options characterises the entire TANDEM3 modular system.

SCHUNK has also developed extensive accessories for the new series. They include universal clamping jaws for 3- and 5-axis machining as well as standardised console plates for easy setup. With the modular system, the clamping technology expert is expanding its already broad standard repertoire to include additional clamping devices for every workpiece. Coupled with

its many years of know-how, SCHUNK can thus meet every customer requirement. The KSP3 is laying the foundation for the modular system of the future. It will be expanded with other products such as 3-jaw vices or electric vices.

The new iTENDO

Milling, countersinking or micro-cutting; the intelligent iTENDO toolholder has already proven its merit in a number of applications. Now its successor is being launched on the market: the iTENDO² is more compact, more powerful and offers significantly more possibilities for applications. Due to its reduced design, it can replace standard toolholders one-to-one and can therefore also evaluate series operations. In addition, its increased speed makes it suitable for applications such as with aerospace technology and micro-cutting.

With the new iTENDO², users have a straightforward way to monitor their machining processes.

The iTENDO² detects when something is wrong with the cutting process. For example, if excessive vibrations occur, if there are chatter marks, or if a tool is on the verge of breaking. Equipped with a sensor, a battery and a transmitter unit, the smart toolholder monitors vibrations at the tool. If the condition of the cutting edge or the tool changes, it can react in real time due to the closed control loop, thereby preventing damage to the workpiece or tool. Its predecessor iTENDO already excelled in



several fields of application when it came to classic milling and beyond. The iTENDO² is now opening doors to even more possibilities.

With its increased speed of maximum 30,000 rpm, there are extensive application possibilities in the aerospace industry, glass processing, the automotive industry and medical technology. It also demonstrates its capabilities on demanding series operations. Due to its optimised installation space, it can replace standard toolholders one-to-one. This eliminates the need to reprogram the machine. Its interfering contour remains unchanged as compared to standard toolholders. The new iTENDO² will be available starting in October in size TENDO HSK-A 63 with a diameter of 20 x 90. Smaller clamping diameters can be addressed by using intermediate sleeves.

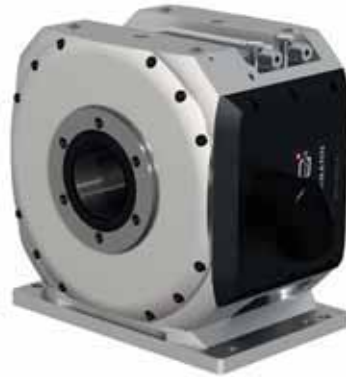
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 Hall 19 - Stand 420

pL LEHMANN turns the tables at MACH 2022

For more than 40 years, pL LEHMANN has been developing and producing compact, high-precision CNC rotary tables. The renowned Swiss company's robust, innovative designs offer a wide range of beneficial features, including a built-in booster for spindle clamping, an internal system for monitoring all important functions and Bluetooth access for remote service. pL LEHMANN's product line also offers a wide range of workpiece clamping options, including options for fully automatic loading and unloading by robots. The comprehensive range is divided into geared and direct drive rotary tables and offers numerous possibilities thanks to the use of a flexible modular system.

Making a MACH 2022 debut will be the company's advanced 900 series. The powerful new range of versatile, direct drive rotary tables are particularly suitable for HSC milling, mill-turn machining, modern hobbing, power skiving, or even demanding grinding operations. The cutting-edge, cost-effective rotary tables are able to transform simple 3-axis milling centres into



multi-functional 5-axis machines. The 900 DD series' durable housing is fully sealed to IP 67 and able to withstand rotations of over 2,000 rpm without a problem.

In response to situations such as emergency stops or power failures, a specially developed 900 DD Fail Safe system brakes the spindle to zero within a very short time, without damaging the rotary table.

To ensure that all customers receive a 900 DD series model that exactly matches

their machine tools and applications, a wide range of accessories and clamping options are available for the standardised front and rear interfaces. The use of a sophisticated clamping cartridge concept ensures that workpieces remain clamped even if no power is supplied. This means that the high safety requirements of international standards are met in the best possible way.

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GDS clamping technologies prove popular for reliability and precision

Thanks to extreme precision, paired with efficient and flexible loading systems, the range of clamping technologies and grinding wheel adapters from GDS Präzisionszerspanungs GmbH have become leaders across Europe in recent years. Now, in partnership with oelheld UK Ltd, the systems are quickly gaining popularity within the UK as customers discover the innovative designs, reliability, and productivity to be gained from the German manufacturer's products.



Originally founded as a subcontract manufacturer, GDS's journey to own brand production began with the μ Grind series, specifically designed for use in tool grinding machines and developed using the insights gained over many years working in close cooperation with customers and leading machine manufacturers. The μ Grind's highly accurate concentricity and repeatability, with runouts holding $<2\ \mu\text{m}$, was hugely successful and the company set out to create further ranges that would help



revolutionise toolmaking. Driven by a passion for precision, the objective was to produce equipment that would provide the highest quality, flexibility, safety, and durability while offering grinders the very best accuracy and surface finish.

This led initially to the xGrind range, which offered more levels of automation, while the company has since developed a full suite of expertly engineered products to cater for all clamping and balancing needs including the VIPER, compatible with high-performance grinding centres, SHARK, multi-range clamping 3-20 mm, ALLIGATOR, fully-automatic and COBRA, two-part clamping, all of which clamp as fiercely as their names would suggest.

Pete Mangan, managing director of oelheld UK, says "The feedback from customers has been resoundingly positive. Reliability of the GDS parts has proved particularly impressive, even when compared with other well-known brands, which is especially important for customers who are running large or 'lights out' batches and require solid repeatability."

Not only are GDS systems popular with customers, but the brand has earned itself a strong reputation with the leading OEMs too. GDS components are compatible with all the leading CNC grinding machine manufacturers, many of whom are now regularly supplying new machines with GDS systems pre-fitted.

GDS's quest to bring about a "revolution in tool grinding" has resulted in a range of products which are highly regarded by customers and OEMs alike, providing the ideal choice for UK grinders looking to increase productivity while maintaining top levels of precision.

Pete Mangan explains: "Our experience shows that the GDS ranges have excellent potential for improving process performance and productivity. We're thrilled to be partnering with GDS to make their range available to grinders here in the UK."

The GDS partnership is the latest in a line of strategic portfolio developments made by oelheld UK to enable the fluid experts to support customers in all aspects of their metalworking fluid systems.



Established in 1998 to bring parent company oelheld GmbH's high quality EDM and grinding fluids to the UK manufacturing industry, oelheld UK has since expanded its product range to include coolant filtration, EDM consumables, workholding and clamping equipment, oil mist extraction, and a UK-wide service department providing ongoing maintenance and support. The company is now uniquely positioned to assist with all elements of a networking fluid setup.

The complete portfolio has one common goal, to enhance the performance of its customer's capital investments by reducing down time, reducing consumable costs and increasing the amount of hours that are available for productive manufacturing, all driven by the company's oelSmart® philosophy, designed to maximise performance, productivity and H&S protections.

oelheld UK will be displaying the full range of GDS products at the MACH exhibition in April, including the industry leading SHARK model, the only five jaw chuck with a $5\ \mu\text{m}$ concentricity available on the market. A GDS Service Expert will be available all week to answer your questions.

To book an appointment, call or send an email.

oelheld UK Ltd
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www.oelheld.co.uk

Visit us at MACH
Hall 6 - Stand 131

Kurt DX6 has a big brother

Kurt Workholding is rolling out the new DX8 CrossOver[®] vice to bring the same benchmark DX-series features to the 8-inch vice platform.

The Kurt DX8 CrossOver is the newest and largest vice in the DX CrossOver family. Combining the best features of the Kurt D810 and Kurt 3800V into a single vice with state-of-the-art features, it sets a new standard in precision flatness, parallelism and repeatability.

The premium, one-piece body design, now standard on all Kurt general-purpose vices, was designed using Finite Element Analysis and has 30 percent less horizontal, push back, deflection than previous DX models. Less vice-body deflection means more stability than a bolt-on design allows and a lifetime of dimensional precision. It's the same design the company has used successfully on 3600V and 3800V models for years.

The DX8 CrossOver vice features the same bed height and keyway to the stationary jaw face as the D810 and a redesigned nut with lighter weight, a new

brush seal design and a larger, stronger bearing pack that's more durable than previous vice designs.

Featured on all new DX CrossOver vices, the redesigned body still retains the lifting handle on the back side of the stationary jaw for easy positioning, while the chip guard no longer passes under the stationary jaw with the one-piece body design and won't protrude out of the back of the vice. Chip guards should be cut to match part sizes. The owner's manual gives full instructions.

The entire DX family of vices feature the proprietary Kurt AngLock[®] spherical segment to create all-directional alignment and reduce jaw lift and improve performance. All DX CrossOver vices also use sine keys for easy, accurate mounting and feature Kurt's Lifetime Ironclad Warranty.

Founded in 1946 in Minneapolis, Minnesota, USA, Kurt helps businesses succeed through best-quality contract machining, aluminum die casting, screw machining and custom product solutions. Kurt's engineering expertise and legacy of



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Leader uses 'downtime' to extend its range

While the COVID pandemic has caused almost ubiquitous business disruptions, the 'downtime' has also presented productivity and efficiency enhancing ancillary specialist, Leader Chuck International, with the opportunity to increase its range of static and rotary self-contained 2, 3 and 4 jaw power chucks.



The comprehensive range of pneumatic and hydraulically activated self-contained chucks has been extended beyond the previous 125 mm diameter limit to cover most popular sizes and fittings. For longevity and accuracy both the static and rotary ranges of the chuck bodies are case hardened to 62 HRC and precision ground, featuring internal safety valves to prevent any loss of pressure and gripping force.

Providing an ideal upgrade for manual lathes, the front mounted pneumatically operated rotary power chucks are now sized at 135-32, 170-39, 215-52, 260-92 and 315-115 mm, comprising diameter and internal bore respectively and featuring maximum gripping force at six bar ranges from 26 to 91 kN with jaw strokes of between 3 and 5 mm per jaw. Maximum operational speed for the smallest 3 jaw chuck is 4,850 rpm dropping to 2,750 rpm for the largest.

Managing director of Leader Chuck International, Mark Jones explains: "Power chucks make it easier and quicker to set up a manual lathe, making them more efficient to load and unload. While the self-contained design of the chuck alleviates the need for a draw-tube to operate the jaws so the maximum turning capacity of the machine tool is maintained."

For static workholding applications, typically billet raw material, forged or cast parts for milling or multi axis machining, the



2, 3 and 4 jaw chucks are available pneumatically or hydraulically actuated. The air-operated PE models and hydraulic HE models are available in the same diameters as the rotary versions but come with an optional through hole also sized to match. Jaw stroke for the PE and HE range is equivalent to the rotary version of the chucks, which for the hydraulic range the gripping force starts at 41.5 kN for the 135 mm diameter chuck and extends to 86 kN for the largest 315 mm diameter version.

Mark Jones says: "Both ranges of the static chucks offer ideal efficiency enhancing replacements for the manual vices typically found in workshops loaded on the tables of milling machines and machining centres. Part-to-part change overs become much quicker using a power chuck and the workpiece gripping forces available provide peace of mind for roughing or finishing operations.

"We offer an extensive range of hardened jaws for such applications and a self-contained foot operated electro-pneumatic switch to make loading and unloading straightforward."

An extensive stock of the extended chuck ranges is available for quick delivery from Leader Chuck International along with expert technical pre- and post-sales advice.

Based in Tamworth UK and Co. Dublin Ireland, Leader Chuck International has an enviable reputation for the in-house design and production of Leader chucking, stationary clamping, gripping and workholding products. A respected brand name for high quality equipment with more



than 70 years' experience, the company also stocks products from the very best suppliers, such as AMCC, AutoGrip, Balance Systems, Blue Photon, CARVEsmart, Cucchi Giovanni, Exact Machinery, FIAL, Gamet, Hainbuch, Hewa, Homge, Jato, K T A Spindle Tooling, Lexair, Llambrich, Maprox, MicroCentric, N G Toolholders, Omil, Orange Vice, Panzeri, PiranhaClamp, PosiStop, Rotomors, RotoRi, Sogimut, Tecnologie FRB, Walmag Magnetics, and ZeroClamp. Proud to provide the best solution in workholding, toolholding and machine monitoring and loading, Leader offers comprehensive, independent ranges of the highest quality, precision and reliability at competitive prices with reliable expert advice and a commitment to customer service.

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 Hall 18 - Stand 18

Holding your attention at MACH

Following decades of providing leading Lang 5-axis workholding and automation systems through a UK agent, Lang Technik UK was established to provide existing Lang users and new customers with first-class levels of sales and application support. The staff of Lang Technik UK invite MACH visitors to its stand to witness demonstrations of the company's renowned products.

Lang Technik UK will be exhibiting Makro•Grip® the original and a leading form-closure technology that provides the highest holding power for 5-face machining. Makro•Grip uses innovative pre-stamping, a technology specifically developed by Lang, where workpieces are stamped outside of the machine tool with up to 20 tonnes of pressure before being clamped in Makro•Grip 5-axis vices. Components requiring high holding power, but also prone to deformation, can be securely clamped by the use of this highly secure stamping process.

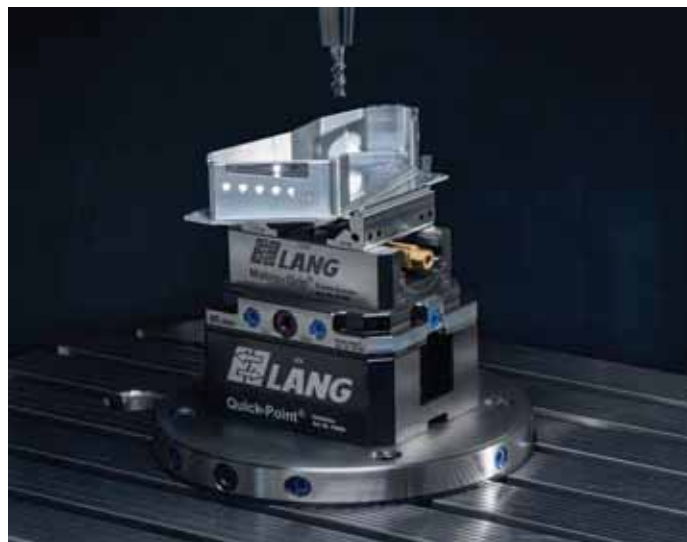
Also being demonstrated will be Lang Technik's famous Quick-Point system. Quick-Point acts as a highly effective interface between the machine table and clamping devices and is offered in an extremely wide range of variants. The fast, accurate and repeatable system allows users to considerably reduce setup times and to constantly adapt to the changing needs of their business. Quick-Point is able to provide a cost-effective solution for every machine table and application. It can be used in vertical and horizontal machining centres, on 3- and 5-axis tables and 4th axis rotary or trunnion systems. The attachment of the zero-point plate to the machine table or faceplate is achieved easily through the use of prefabricated hole patterns for common t-slot distances, bore patterns and bolt circles or individual, customised mounting options.

Making a MACH debut will be the Robo Trex 52 Automation system that is able to load and unload machine tools and provide highly efficient lights-out production. Also being put through its paces will be the ingenious HAUBEX low cost automation system.

Lang Technik UK director, Gareth Barnett says: "Our team of experienced engineers have many years of machine tool experience and applications related to all aspects of workholding and we are looking forward to greeting all potential Lang Workholding customers at MACH 2022."

LANG Technik UK has been established to provide sales and application support for new and existing customers of its leading 5-axis, workholding and automation systems.

Its goal is to increase customer productivity by perfecting manufacturing processes offering a complete and proven package



of workholding, zero point clamping and automation for machine tools. Its pre-stamping technology is considered a 'benchmark' in workholding making its 'all in one' solution truly unique.

All its products are beneficial to machining processes which maximise manufacturing capacity. Simple operation and great versatility enable the daily work of its customers to be straight forward and help maximise their profits.

While its automation systems are a distinct feature in many production facilities, it is primarily the items that are inside the machine tool which often make the biggest difference.








Its influence may not always be immediately apparent but wherever parts are being clamped and milled at the highest level, it is there, contributing to a more efficient manufacturing process.

Companies of all sizes and from a vast range of industries trust the company's experience. It shares knowledge with machining companies and helps them to maximise their manufacturing potential.

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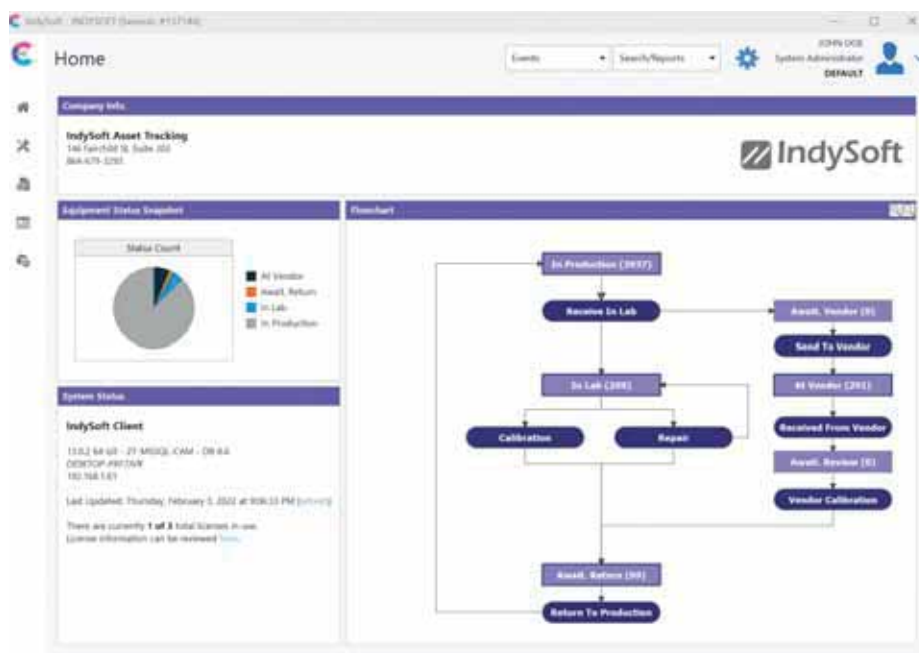
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IndySoft's new release is coming with a new name

IndySoft Corporation, a leader in calibration and asset management software, has announced that the upcoming version 13 release of its best-in-class calibration management software will be coming with a new name. IndySoft Client, used by enterprise customers performing calibrations, will be called Calibrations.com, while Indysoft for Commercial Lab Management, used by commercial calibration companies for the end-to-end process management of running a commercial calibration lab, will be called CommercialLab.com.

The rebranding reflects IndySoft's progression from a company focused solely on calibration management to one with its sights set on the larger asset management market. The first step in expanding IndySoft's presence into other markets is separating the company name from its product names.

"IndySoft has a strong reputation in the asset management software market that we have built up over the past 25 years," remarks CEO and founder, Rhett Price. "We are proud of that and will keep it as our company name, but the timing makes sense now for us to separate our product names from the company name. We have new software applications in the pipeline that will have product names very targeted to their functional category, so we thought it only made sense for us to do that with our calibration and commercial lab focused products as well."



When choosing the new product names, IndySoft wanted to make it crystal clear what you were getting. "Just as you know exactly what you are going to get at Stamps.com, Calibrations.com and CommercialLab.com tell you all you need to know, just with the name," notes Rhett Price.

The inclusion of .com in both new product names was intentional to communicate the shift to a web-based SaaS product. Rhett Price explains: "In 2017 we introduced our Cloud-based model to some weary industrial customers. We've proven that Cloud software can and does work

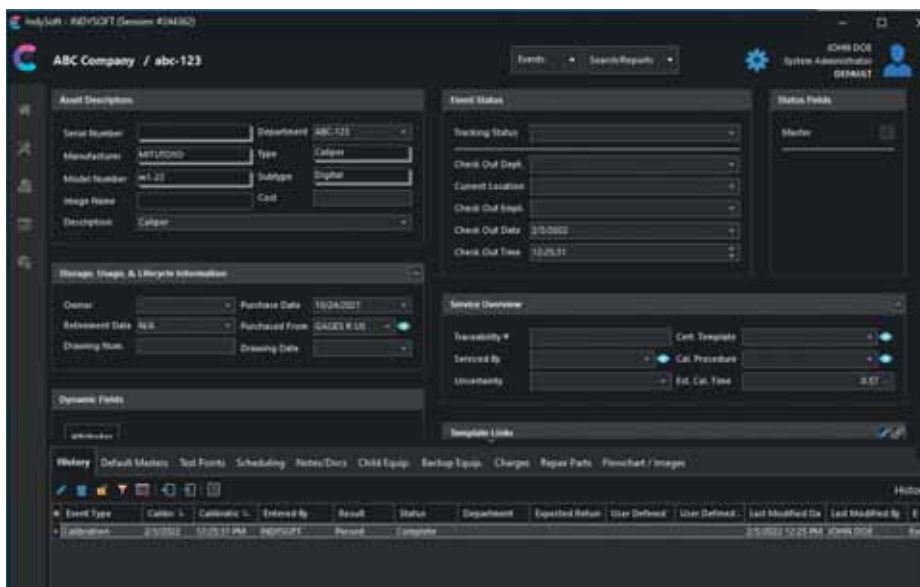
incredibly well, while taking security, IT and hardware concerns off the hands of our customers. Overall, customers in our market are getting much more comfortable with the SaaS model and, as a result, we have experienced year on year growth with the majority of our new customers adopting the Cloud model. While we don't expect it to happen in the next year or two, we expect and hope that all customers utilize our Cloud solutions in the not too distant future," IndySoft will continue to offer on-premise solutions with the new .com names.

Along with the name changes, IndySoft put a lot of effort into improving the user interface with version 13. The new interface has a cleaner, more modern appearance, while maintaining access to the same features and functionality that IndySoft customers depend on.

HiDPI, which stands for high dots per inch, is supported so users with a high-resolution screen will enjoy extra crispness in the text and graphics within the application. There will also be a dark mode option that enhances visual ergonomics by reducing eye strain and providing comfort in low lighting settings.

Version 13 will come with a new Layout Designer that will allow screens to be arranged in real-time and layouts will be able to be zoomed in and out of for optimal viewing, depending on the task at hand.

Customer feedback drove the majority of



the other 180+ features and functionality improvements in version 13. Rhett Price says: "We are continually asked for additional fields, so we added over 50 new fields and expanded all Company and Equipment ID fields to 50 characters. We've added a new Specification Management tool that will greatly ease the complexity of on-the-fly uncertainty calculations. We've added the ability for multi-station login which allows one user to work on multiple calibrations on multiple computers at the same time. Also, with the addition of new advanced test point layouts for calibrations, complex calibration data entry requirements can be made clear and simple for technicians. We've added a new administration mode to speed access while simplify things for non-admins. These additions were the direct result of customer feedback.

"We were also able to satisfy the requests of our larger enterprise customers. New version 13 functionality that was driven by these customers includes Azure and AWS cloud document storage, enterprise Single Sign-On which enhances security and enables users to authenticate with a single ID for multiple systems and UTC date and

time stamping for all events and system logs which improves the management of databases that stretch worldwide."

Version 13 will have an add-on Key Performance Indicator (KPI) module that gives managers and decision-makers a top-level graphical summary of core business objectives to keep on top of changes, issues and trends in performance. Managers can quickly review employee productivity to see the average time spent on calibrations, repairs, or anything else they might care to track. They can view financial trends by equipment category, employee, or shop branch. You can easily check the pass/fail rate by manufacturer and model number to get an accurate analysis of operations and keep track of how often standards are used, when they need to be calibrated, the number of calibrations they have performed and the associated revenue. With both out-of-the-box KPIs and the ability to create their own based on any data input into IndySoft, there is no limit to visualising any statistics desired.

Calibrations.com and Commercial Lab.com are currently going through beta testing. The eventual release date will



depend on how the beta phase goes but is expected within the first quarter of 2022.

IndySoft has long been a leader in the calibration management software sector. With the introduction of Calibrations.com and CommercialLab.com, IndySoft further offers enterprise customers performing internal calibrations and commercial calibration companies' innovative solutions to solve their problems, improve their processes and create efficiencies.

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www.indysoft.com

Visit us at MACH
 Hall 19 - Stand 627

First showing in the UK at MACH

As a leader in the manufacture and supply of Optical3D metrology products, Bruker Alicona's booth will be of great interest to all visitors at MACH.

The stand will feature a selection of products from its range of optical metrology solutions that have become the de facto products for use in both tool measurement and the measurement of engineered surfaces.

The featured product, shown for the first time in the UK, will be the μ CMM fitted with the pick and place automated loading system. The μ CMM has changed the face of measurement technology in industry and, when combined with the 5-axis option and the automated loading system, provides a unique solution to engineers and toolmakers throughout the world. It enables the automatic critical inspection components with user influence.

The μ CMM is a floor standing measurement system that can be used in both a production environment and also in a measurement room. For those companies who do not have room for or need such a

large system, there are other products on display that can accommodate those requirements.

The first of these is the G5 system fitted with the Advanced Real3D rotation device providing 5-axis movement. This instrument allows the full geometrical measurement of components in a compact bench mounted system that does not require any special environment. It can be used both in production and also in a research and development environment.

To complete the comprehensive line up at the show, the InfiniteFocus SL system will be on display. InfiniteFocus SL is a cost efficient optical 3D measurement system for easy, fast and traceable measurement of form and finish on micro structured surfaces. Users can measure both form and roughness of components with only one system. In addition, colour images with high contrast and depth of focus are achieved. The long working distance of up to 33 mm in combination with its



measurement field of 50 mm x 50 mm allows a wide range of applications.

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 Hall 18 - Stand 500

SigmaNEST 2022 advances CAD/CAM while expanding 'Connected Shop'

CAMBRIO, a leading innovator in the CAD/CAM fabrication industry, has announced version 22 of the SigmaNEST software suite. Across the board, improvements enhance all areas of the SigmaSUITE product portfolio, including CAD/CAM nesting for router, bevel, punch and cut-to-length and also expands 'Connected Shop' capabilities that will help both large and small fabricators.

"SigmaNEST is committed to helping our customers drive the fabrication industry, not only through a wide array of CAD/CAM enhancements, but also through our innovative Connected Shop solutions built just for fabricators," says engineering VP Glenn Durham.

Users will notice the difference right from the start with a redesigned installer that detects all existing products for upgrading. Programmers get a jumpstart with enhanced import capabilities for the latest native CAD formats, such as sketch association to SigmaNEST operations for NX and 3D part property mapping for SolidWorks. In addition, the SigmaNEST shape library has been improved to enable super-fast parametric geometry edits for more efficient CAD programming.

SigmaNEST Version 22 introduces a number of UI enhancements, such as options to change the sheet names in the feature tree, granular control over hatching density for reporting visibility and multiview layout sequencing. Users can also select the correct Machine Bed Drawing directly from the Machine Parameters Config menu to see their stock in relation to the bed size and slat locations.

SigmaNEST v22 features a graphical indicator to enable users to validate tab locations for the entire nest before sending the NC program to production. Additionally, part reporting capabilities have been extended with support for part process parameters, such as amperage or gas type, improved visual aids for nest detail text and the ability to highlight mirrored parts with hatching styles.

Finally, SigmaNEST has been re-engineered for direct transactions within SigmaSUITE, creating a 30 percent speed improvement on processes that required



SimTrans transaction manager. Customers that don't have an MRP/ERP connection can upgrade without the cost of SimTrans and those configurations that require an MRP/ERP connection are now much faster.

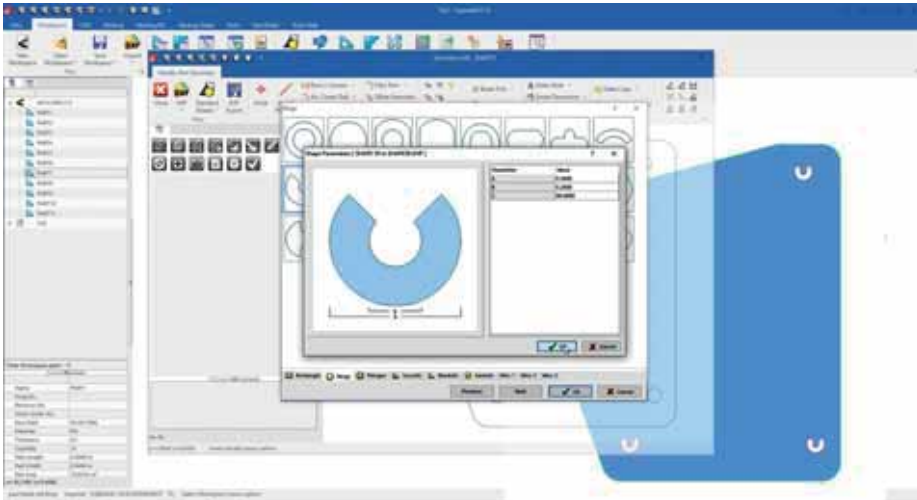
SigmaNEST Router is now 3D-capable, allowing users to visualise pocket depths, ramping between Z-level depths and tool changes. 3D Router allows users to define the optimum cutting method, based on the ratio between part geometry shape and material removal, resulting in fewer passes and a more efficient toolpath. In addition, SigmaNEST 3D Bevel has updated I-Cut control to manage the rotation and tilt, so that straight cuts are treated as a zero-degree angle to ensure a perfect edge. Further enhancements include the ability to move lead-in positions for profile destruction to eliminate unsafe head movement and the ability for bevel programmers to use 2D geometry with the Rule Manager to extrude fixed bevels, and easily generate leads, corner loops and transitions.

SigmaNEST Punch has gained several productivity features, including improved nesting for automated common line cutting

for single, same and multipart geometry that easily recalculates for different tool sizes. Clamps can now be repositioned on the fly and a new multi-torch simulation allows users to check torch sequence and spacing before production. Automatic punch sequencing for part removal adds new flexible rules, such as removing small parts first or working towards the clamps to retain plate rigidity. Finally, the new tool manager allows tools to be quickly added, saved as a group and ported between jobs.

Other products within the SigmaSUITE portfolio have also seen significant updates. SigmaDEVELOP has added flange collar options to transition from rectangle to round/oval shapes and the ability transition zero-radius corners on a rectangle to elliptical shapes. SigmaBEND AP introduces additional machine support, reusable tooling setups for future applications and support for 3D assembly filters.

As another integrated piece of the Connected Shop, SigmaCTL is now upgraded for better quoting, job creation and part tracking/unloading. SigmaCTL now works with both SigmaSCHEDULE and Load Manager and is augmented by a new CTL



purchasing button allows the user to select multiple jobs to calculate material requirements and combine common elements into a single PO to be used for all jobs. Lastly, estimators can quickly copy items from job to job along with any price adjustments or additional costing factors which significantly speeds up quoting for similar projects.

Glenn Durham concludes: "Team communication is a critical part of manufacturing success. The need to connect all operations and track the workflow throughout the shop is growing in importance. Version 22 is a substantial release and another step towards joining the dots to ensuring our customers are best positioned to benefit from the latest technology advancements and industry drivers."

About CAMBRIO

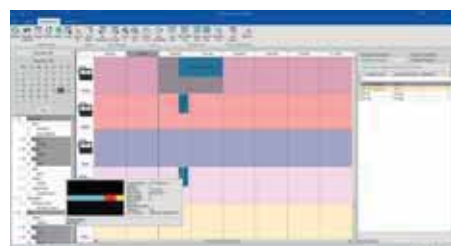
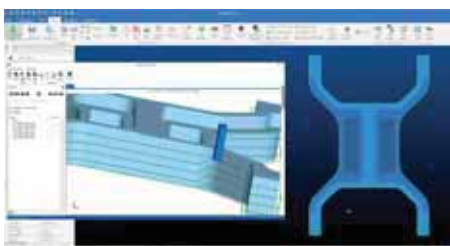
CAMBRIO is a leading CAD/CAM innovator in the fabrication, toolmaking, and production machining industries. The expansive product portfolio of GibbsCAM, Cimatron and SigmaNEST offers a diverse set of SMART end-to-end design and machining software solutions which help customers expand their potential and drive the future of manufacturing. With almost four decades of strong manufacturing history, a machine-agnostic approach and extensive integration capabilities, it uniquely empowers customers in all major industry sectors.

With direct representation in over 15 countries and 100+ product resellers, its customer focus is supported by a worldwide team of consultative professionals and experienced product experts.

About SigmaNEST

SigmaNEST is a leader in innovative end-to-end CAD/CAM software solutions to help professional fabricators increase ROI by optimising material utilisation, machine motion, manpower and data management. With unmatched versatility and maximum scalability, the comprehensive product portfolio covers the full range of fabrication workflow from quoting to shipping, including robust integration with a wide range of business systems.

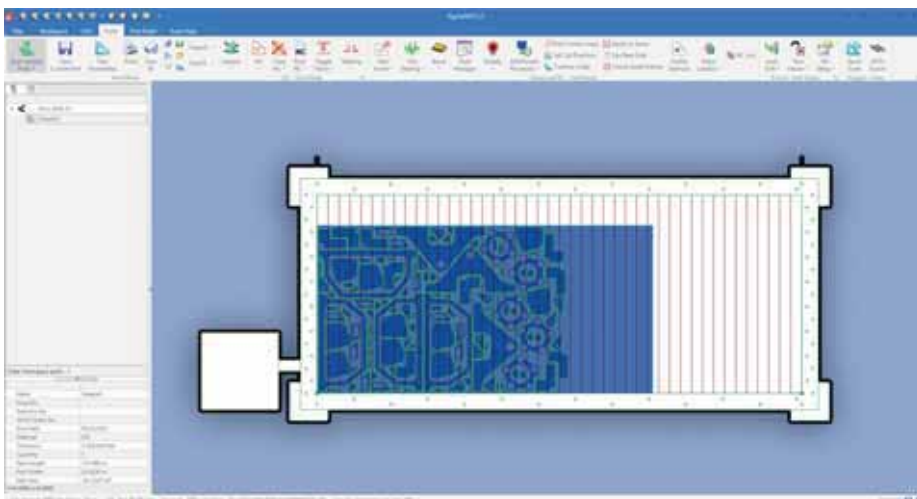
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www.cambrio.com



The Connected Shop solutions also gain important functionality throughout. SigmaSCHEDULE now analyses jobs for any items that require secondary operations and prioritises them to allow for better efficiency, a quicker start in production and reduced idle time. Additionally, Load Manager can now intelligently distribute process tasks within a machine group for better manufacturing capacity with automated load balancing.

SigmaMRP and SigmaQUOTE offer improved user access permissions for a 'view only' mode which allows full visibility, but no editing capabilities. Both programs resolve any fractional cost amounts to ensure accurate accounting and a smart

Feedback app to manage programs at the machine. In addition, users can now specify load orientation and even mix parts from across jobs to truly optimise their material savings with the optimum nest. SigmaCTL, along with SigmaTUBE, can now export a 3D nest as either a STEP or IGES files to interface with new machine manufacturers.



hyperMILL end-to-end CAM solution is now even more powerful

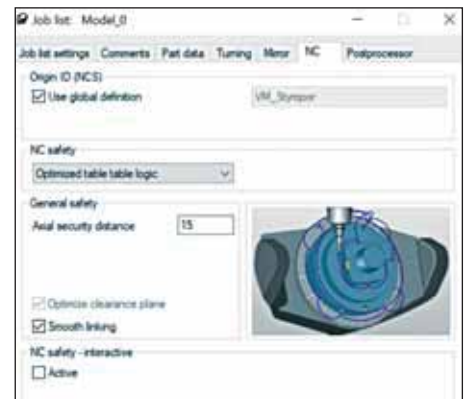
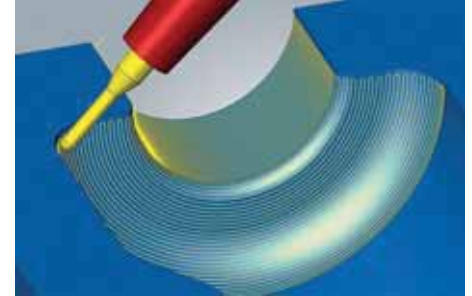
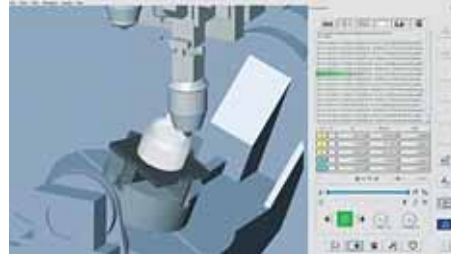
OPEN MIND Technologies will once again be returning to MACH and will give a MACH exhibition premiere to the latest version of its hyperMILL® CAD/CAM software. Version 2022.1 will incorporate more features, optimised strategies and a host of major enhancements for more powerful and simplified machine and controller independent NC programming.

On its stand, OPEN MIND experts will demonstrate the optimisations to hyperMILL that include enhancements to the 5-axis strategies in VIRTUAL Machining. This will provide users with better results in terms of surface quality, new options for 2D functionality as well as efficient innovations in electrode manufacturing that deliver more convenient and faster programming.

hyperMILL VIRTUAL Machining is all about generating, optimising and simulating NC code reliably through a collection of targeted solutions. Virtual Machining can be used to map all process steps in CNC manufacturing for perfect process control. The modular technology now also supports additive machining programs. The Optimiser module, which delivers powerful optimisation algorithms for efficient multi-axis machining, also features the 'Optimised Table-Table Logic' function for easy programming and reduced air time between cuts. The user selects a distance value and the Optimiser automatically calculates the safety distances using the raw part, component and clamps selected in the job list.

The defined distance is maintained for all components and the movement sequences are automatically optimised. This makes the generating of ideal linking movements even easier. Also, the new feature of direct data transmission in the CONNECTED Machining module provides additional safety during tool input. Instead of the traditional manual input, the parameters are transferred directly from hyperMILL to the controller.

The three hyperMILL VIRTUAL Machining modules for the seamless merging of the virtual and real worlds form the core of the safe simulation solution. The Centre module virtually maps real machining situations for the machine and controller and simulates these based on the NC code. The Optimiser



module provides powerful optimisation algorithms that ensure efficient multi-axis machining. It also automatically identifies the best inclination for top machining results. The CONNECTED Machining module enables in-depth networking and synchronisation with the machine.

Another tool for ensuring greater efficiency and cost-effectiveness in machining is the intelligent real-time component alignment in CAM using hyperMILL BEST FIT. The unaligned component is probed on the machine using 3D probing and the probing points are sent back to the CAM system in the form of a measuring log. hyperMILL BEST FIT then precisely adjusts the NC code to the actual component position. The adapted NC code is subsequently simulated in the virtual machine on the actual clamping setup and optimised automatically.

Machining strategies for 2.5D, 3D, HSC, Mill/Turn and 5-axis applications offer the ideal solution for any machining situation. In the area of 5-axis radial machining, new improvements raise the bar in blow mould machining. The new 'Flow Equidistant' infeed strategy is the first of its kind that supports the generation of toolpaths with a constant infeed for vertical and challenging surfaces. This means that these surfaces can be integrated into the overall machining

sequence and processed in a single step to provide seamless machining with a very high surface finish quality. New undercut detection automatically identifies undercuts and makes the corresponding machining adjustments, if desired. This means that undercut areas can now be skipped with no manual intervention necessary. As a result, users do not need to generate additional surfaces.

A dedicated 3-axis machine mode greatly simplifies the use of radial machining on these machines and the 'Smooth Overlap' function can be applied to the general milling area without selecting a boundary curve. For instance, the 'Smooth Overlap' function blends the transitions between two surfaces that have been milled in different machining directions. This results in perfectly transition-free surfaces.

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W9525T5
W9530G0G90A0.3500M3
W9535G54X-4.8Y-2.
W9540G43H421.M8
W9550G98G12-2.77R-2.42F
W9560X0.Y-2.
W9570X4.8753Y-2.
W9580Y2.
W9590X0.Y2.
W9600X-4.8Y2.
W9610X0.Y0.Z-2.02R-
W9620G80
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W9675T6
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W9685G54X-4.8Y-2.
W9690G43H521.M8
W9700G98G12-3.3R-2.42F
W9710X0.Y-2.
W9720X4.8753Y-2.
W9730Y2.
W9740X0.Y2.
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(Center drill .500 holes - A0)
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W9525T5
W9530G0G90A0.3500M3
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W9540G43H421.M8
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W9570X4.8753Y-2.
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W9675T6
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W9685G54X-4.8Y-2.
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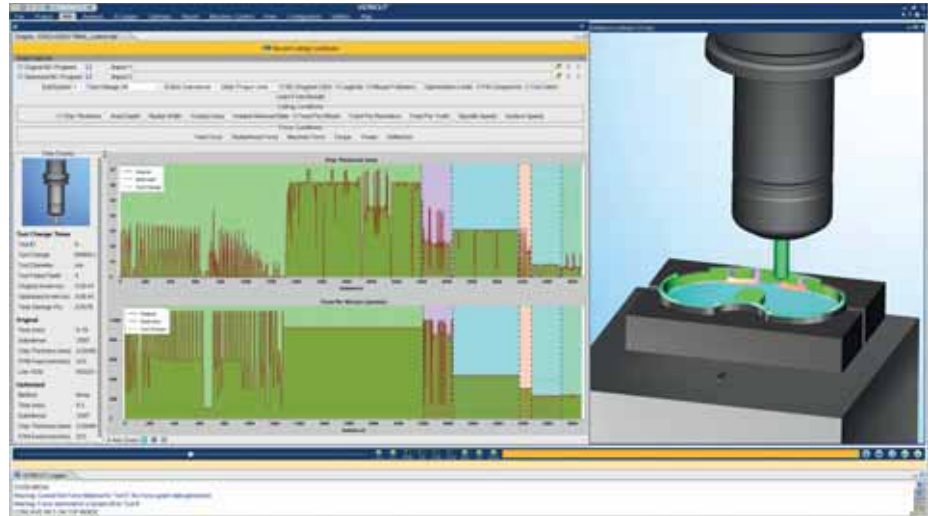
CGTech will take your business to the next level at MACH 2022

'If you always do what you've always done, you'll always get what you've always got' is a truism that CGTech, developer of VERICUT, has been stating to manufacturers in many industry sectors since 1988.

Visitors to the MACH 2022 exhibition can find out from the experts in NC code simulation how the software can take their business to the next level. With VERICUT, CGTech offers a wide range of products and solutions that ensure CNC machine tools run collision-free and manufacturing processes operate more efficiently with increased profit levels.

Demonstrations of the latest features in version 9.2, plus an exclusive preview of what's to come in 9.3, of VERICUT CNC machine simulation and optimisation software will be conducted on the stand by the company's knowledgeable technical engineers. VERICUT software is the industry standard for simulating CNC machining in order to detect errors, potential collisions, or areas of inefficiency. It operates independently, but can also be integrated with leading CAM systems.

Managing director Gavin Powell says: "VERICUT has been designed to meet the needs of all types of shops, from small job shops to OEMs and Tier 1 suppliers that are regularly pushing the limits of CNC technology. The enhancements in version 9.2 provide the speed that shops of all sizes need to produce more efficient programs faster and get their products to market more quickly and competitively, while promoting



conservation of valuable material and human resources"

CGTech will also demonstrate VERICUT's Force optimisation module at MACH. VERICUT + Force provides an integrated simulation-optimisation solution that can significantly reduce machining times, improving cutting tool and machine life. New and legacy NC programs can be optimised with Force to run as efficiently and safely as possible. Force is available for milling, turning, and mill-turn machines.

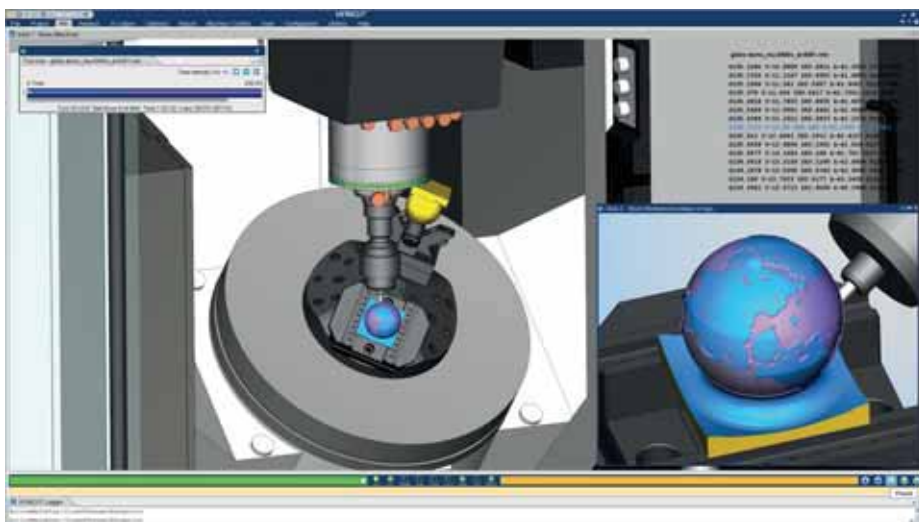
Force is a physics-and mathematics-based module designed to optimise machining feed rates. The software uses actual data for cutting tool forces and spindle power readings to calculate maximum chip thickness and feed rate.

Sales manager Scott Ravenscroft explains:

"VERICUT covers the obvious and visible production elements, such as crashes, scrap, gouges and prove outs. Force addresses the hidden opportunities and these include inefficient programming and suboptimal feedrates caused by the CAM system's inability to adjust cutting feedrates for varying cutting conditions."

Force relies on proven technology to maximise program efficiency and productivity and typically achieves savings of 8 to 15 percent on aluminium and 15-plus percent on difficult to cut materials. Return on investment can often be as little as one production component, with the opportunity to analyse cutting conditions, improve tool life, protect CNC machine tools and reduce operational costs.

Gavin Powell concludes: "Companies now, more than ever, are realising the importance of simulation and the digital twin model. We are working closely with our customers and partners around the world to understand their exact needs, delivering superior technical and economical solutions through the use of advanced technologies."

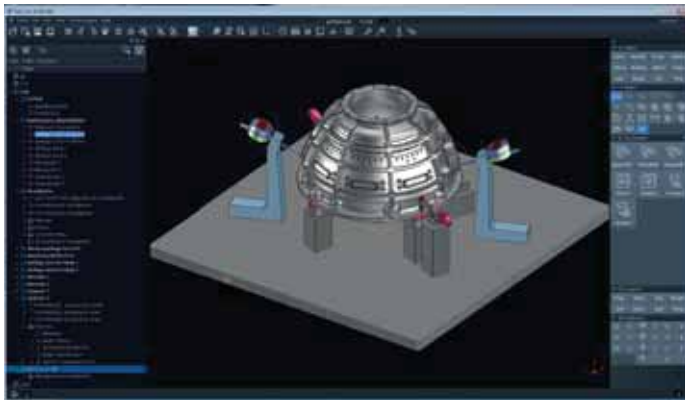


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Tebis CAD/CAM/MES to demonstrate intelligent manufacturing at MACH

Tebis, a specialist provider of CAD/CAM and MES solutions for mechanical component, model, pattern, die and mould manufacturing, will be exhibiting at MACH 2022. The latest release of Tebis CAD/CAM software Version 4.1 and ProLeiS MES will be available for live viewing throughout the duration of the show. The Tebis UK team will also have scheduled live technical presentations each day during the exhibition.



Tebis Version 4.1 is a complete CAD/CAM system, designed for intelligent manufacturing. The new release moves one step further for optimisation of CNC machining processes. Tebis V4.1 has been extended to include a new clamping device library, intelligent collision avoidance strategies, in-process measurement cycles and seamless integration of Tebis ProLeiS MES system.

One of the major additions of the functionalities of Tebis 4.1 is parametric-associative modelling, which further supports highly automated processing in a single complete CAD/CAM system for design, manufacturing preparation and CAM programming.

The proven manufacturing database libraries, where all of the manufacturing components and experience data are stored, have been supplemented with a clamping device library in the form of digital twins. This can be used to conveniently create and manage clamping elements and clamping device groups to set up the machine in the virtual environment.

Tebis 4.1 also supports measurement cycles, which can be fully integrated into CNC machining processes. This allows users of Tebis' CAM system to check if the component is correctly clamped and the blank is correctly dimensioned and oriented, ensuring shorter setup and machining time, higher component quality and fewer corrections.

For even greater safety with Tebis 4.1, machine tool heads are fully accounted for in collision checking during NC calculation. In the event of potential collisions with machine heads, the affected areas are automatically reduced or excluded from machining. The same also applies here. The check is performed using the real head geometry, not substitute geometry.

Tebis ProLeiS MES software fully integrated

Large savings can potentially be made in single-part manufacturing, thanks to optimised and stored manufacturing processes. With ProLeiS and Tebis 4.1 you can split up entire assemblies and individual parts into proven processing sequences. Even complex

manufacturing projects can be planned, controlled and implemented. Logistics for purchased parts, blanks and machine components are also accounted for throughout the process. The key advantage is that your machines are optimally utilised and all activities can be assigned to specific manufacturing designs, NC programmers and machine operators.

ProLeiS MES can also be easily combined as an integration platform with upstream and downstream systems like PDM, ERP and machine control systems.

Joe Zhou, managing director at Tebis UK explains: "Manufacturing processes should be consistent and reliable. This is where Tebis can help companies by optimising and standardising their CNC processes and automating their CAM work. The best practise of a company can be built into Tebis library database, which can then be shared and reused for daily operations. This will help to optimise usage of machine capacities and cutting tools, as well as to optimise the machining processes and machining parameters."

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Comprehensive punching capability for Electrium

An LVD Strippit PX 1225 CNC punch press with an Extended Tool Magazine (ETM) gives electrical equipment manufacturer Electrium the capability to respond quickly to changing production demands while eliminating setup time.

Electrium, part of the Siemens Group, is a UK-based manufacturer of electrical equipment under the brand names of Crabtree, Wylex, Volex and Appleby.

At its Wythenshawe facility, Electrium manufactures a wide range of sheet metal components for domestic, commercial, public sector and industrial installations using LVD EasyForm press brakes and punch presses. Batch sizes can range from a one-off to 100-off on a sheet.

Around 15 years ago, it moved from using hard tooling on power presses to more flexible CNC punch presses as it moved from a high-volume, low-variety manufacturing model to lower volume, high-variety production to meet the changing needs of the market.

In that time, it has installed a number of LVD punch presses, most recently two LVD Strippit PX 1225 machines, the first in 2014 and the second, with an ETM in 2019.

As opposed to a turret punch press, the PX machines have a single punching head with all tool rotation tools held in a carousel on the machine. The tool carousel has 20 tool positions and the ETM adds 40 more.

Each tool can be rotated through 360° and the machine's configuration allows for extensive forming and secondary operations



to be carried out as part of the punching process.

Senior production engineer Darran Lees says: "We make a wide range of electrical equipment for domestic and commercial installations and the sheet metal content of that includes panel boards, end plates, boxes and fabricated components that are formed, punched and press braked. The end products range from the domestic circuit protection boxes you have in your cupboard at home to large systems that go into schools, hospitals, and commercial buildings. Some will be sold via electrical wholesalers and merchants such as Screwfix and some will go direct to contractors for large projects.

"This means that there is quite a lot of variability in what we are making, with medium to small batch sizes, down to one-offs, so we need to be very flexible in our manufacturing."

The new PX 1225 with the ETM is also used in conjunction with Multitools, which further increases the number of available



tools as Darran Lees explains: "In contrast to a traditional turret punch press where you only have a single punch in each tool, if the punch is under 12 mm diameter you can have ten of them in a multitool.

"We have 20 toolholder positions on the machine, with a further 40 toolholder positions in the ETM. On top of that we have 10 multitools, five with five individual punches in them and five carrying ten punches.

"That gives us an extra 75 tools in only 10 stations and a total of 125 tools available. We need that amount of tooling to cover the range of our products.

"On one job for electrical boxes we use all twenty tool stations including four multitools. That is 50 different tools on one panel."

He adds that an incidental benefit is that the multitools are very cost-effective. The drop-in punches are a cheap disposable item, whereas a dedicated punch tool would cost 20 times as much. "It saves you thousands of pounds," he says.

The ability to rotate any tool through 360° adds another level of versatility.

"It is absolutely important to us," says Darran Lees. "If you saw the profiling of some of the shapes we punch, you would think that they would be done on a laser."

Perhaps the biggest benefit in terms of



productivity comes from the ETM. Because all the tools are there and ready to be loaded onto the machine in seconds, setup time is almost completely eliminated. If different tools are needed that are not already in the magazine, they can be loaded while the machine is still operating.

"We aren't doing high-volume work, so we could be doing 20 different jobs in one eight-hour shift, says Darran Lees. "Before we had the ETM we might have taken up 25 percent of our production time with setting."



It also eases staffing requirements: "If we only have an operator available rather than a setter they can still run the machine if the tools are in the carousel and ETM. Anyone can run the machine as long as they are trained to operate it, they don't need to know how to set it."

He adds that LVD's Touch-P control is very intuitive and user-friendly: "It is very easy to learn how to load a program and get it running. The technology on the control makes it really simple to use."

In fact, the production team at Electrium were so impressed with the Touch-P control that they had it retro-fitted to the company's older PX machine. The final piece in the jigsaw is the ability of the PX punch presses to carry out a large amount of form work.

"I would estimate that 99 percent of our parts involve some kind of form tool," says Darran Lees. "Typical form tool functions include producing louvres and knockouts, embossing, bending and tapping. We are also keen on exploiting new tooling technologies such as rolling offset tools and a 'clicking' tool that allows you to simply click two sides of a box together without the need for any welding which saves us time."

Summing up the benefits of the new LVD



Stripit PX 1225 with the Extended Tool Magazine, Darran Lees concludes: "The combination of the sheer number of tools we have available, the ability to rotate any tool through 360° and the ability to carry out form work on the machine, gives us the capability to respond quickly to a large variety of production demands with minimal setup times."

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New ByBend Smart

Faster and more precise with even more options

The new ByBend Smart from Bystronic increases the flexibility and in particular the speed of bending. Thanks to its numerous functions and options, the new machine offers the decisive plus in bending technology at an attractive price.

The ByBend Smart offers high-quality Swiss bending technology and numerous new functions at an affordable price. This is its recipe for success. From the very onset, Bystronic designed this press brake to offer a performance package with intelligent functions that enable users to produce parts in high quality and at low cost.

The new press brake offers numerous additional functions. The ByBend Smart is now even more versatile for an even wider range of applications. It is 30 percent faster than conventional bending and even 50 percent faster with the new "Efficiency Booster" option. This makes it the ideal machine for those sheet metal processing companies for which time is a crucial factor in the day-to-day competition for orders.

30 percent more flexible

One of the ByBend Smart's flexibility-enhancing features is the insert and stroke length expansion. This upgrade, which is available with the purchase of a new machine, extends the insert height for bending tools from 480 to 580 mm. The additional 100 mm boost the ByBend Smart's flexibility by as much as 30 percent, because this means that higher tools can be used, which enables users to produce parts with lower bending edges. This is particularly useful when bending boxes and drawers.

Another new optional feature is the 5-axis



backgauge. Until now, users had the choice between a 2-axis and a 4-axis backgauge system. Users who choose the 5-axis system can now also use the ByBend Smart to bend complex 3D parts, for example, sheet metal products where the bending edges are not just parallel, but also at angles to each other. Similar to the expansion of the insert height and stroke length, the various backgauge systems represent an option to increase the bending versatility. The basic version of the ByBend Smart comes with a 2-axis backgauge system.

More speed for a competitive advantage

In addition to a wide spectrum of applications, fast bending sequences and short manufacturing cycles frequently play an important role for users. Here, increasing process speeds and shortening setup times are key. This is precisely what Bystronic offers with its range of high-speed options for the ByBend Smart.

"Efficiency Booster" option saves energy

The new "Efficiency Booster" is an optional feature that ensures a fast return of the upper beam, speeding up the bending process by up to 20 percent.

The machine's main drive is only active when the machine is actually in operation. This is the logic of the "Energy Saver" that reduces the power consumption of the

machine while also boosting productivity and offering the added benefit of minimising noise and waste heat.

Upon request, higher-performance mechanics are available that enable the ByBend Smart's upper beam to move at higher speeds during the rapid movement and bending phases. The "Fast Bend M Safety System" option consists of a laser safety system that allows the upper beam to move almost all the way to the part that is being processed at the rapid movement speed. The high-precision laser sensor allows the ByBend Smart's control to reduce the upper beam's speed from up to 200 mm/sec, rapid movement speed to 16 mm/sec bending speed, just before reaching the metal sheet. The laser safety system functions like an intelligent brake assistant that permits the machine to move at a higher speed for longer. This offers users a speed advantage of up to 30 percent.

Optimal material handling

During the bending process, dynamic sheet followers support and guide large and thin sheets, as well as heavy, thick sheets with long bending flanges. The control synchronises the movement of the bending aid with the actual bending process and the vertical movement of the H-axis.

The dynamic sheet support is designed for machines with a press force between 100 and 300 metric tonnes. The lifting capacity is 100 kg per set, at a distance of approximately 800 mm from the bending line. The dynamic sheet follower is operated simultaneously with the upper beam.

It increases material handling flexibility, in particular for small batch sizes with changing material types and thicknesses. Optionally, there are rollers available for heavy parts. The table can be converted from plastic rails to rollers or brushes in a matter of seconds.

Special packages for every demand

The optional functions are available in three special packages, which are tailored to the needs of the individual users:



Comfort Package

- Bystronic know-how: dynamic crowning
- Advanced options provide higher flexibility for tooling and box bending

Productive Package

- Tooling flexibility with maximum productivity and flexibility

Tropical Package

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Intelligent control for precise bending results

When it comes to bending technology, simple operation is a key factor for many users. Load the bending plan, set up the machine and start bending. This is precisely what the ByBend Smart and the ByVision Bending user interface offer. ByVision Bending is included in the ByBend Smart's basic version. Operators launch all the bending processes with just a few swipes of the finger on a 22-inch touch screen. ByVision Bending has an extensive database that includes the parameters for all the common types of sheet metal and bending

tools. Depending on the material thickness and bending angle, the user interface determines the ideal bending process and suggests the suitable tools.

The dynamic crowning ensures high-precision air bending results. This unique assistant function is only available in this form with press brakes from Bystronic. Thanks to its sensor system, the ByBend Smart's crowning recognises the position and length of the sheet metal part. This sensor system is integrated directly into the ByVision Bending control, enabling the ByBend Smart to automatically ensure the ideal distribution of the bending force across the entire bending length without requiring the operator to deal with complicated details. This results in precise and consistent angles with every bend.

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ABB launches industry-first smart factory solution for safer, more autonomous and efficient steel melt shop operations

ABB has launched ABB Ability™ Smart Melt Shop, the first smart factory digital application of its kind for the metals industry. It is designed to increase melt shop productivity, save energy and improve employee safety, with payback within six months.

Based on advanced digital algorithms, the new solution is unique in that it offers not only powerful real-time ladle tracking but also automated crane scheduling and a predictive thermal modelling engine. The tracking engine follows ladle movement via cranes and transfer cars in real time. Radar and laser positioning technologies provide accurate visualisation while reducing hardware footprint and maintenance needs compared to radio-frequency identification (RFID) solutions. The automated crane scheduling includes job forecasting, route planning and automatic acknowledgement of jobs.

This will enable steelmakers to move towards autonomous operations by eliminating manual coordinations, with

increased safety in hot zones due to lower footfall.

The thermal engine function uses ladle thermal history from the tracking engine and forecasted heat movement from scheduling engines to predict the thermal loss during ladle transfer and predicts the correct lift temperature at ladle furnace. This results in better superheat compliance at the caster, eliminating caster slowdowns, hence increasing productivity.

Steelmakers can expect ABB Ability Smart Melt Shop to help increase superheat compliance to enable 4-5 percent higher casting speeds, improve productivity and reduce arcing by 5°C per heat in ladle furnaces for increased energy and cost efficiency.

ABB Ability Smart Melt Shop has already been installed by JSW Steel Ltd, India's leading steel company, where it has been integrated into a wider expansion at Dolvi Works plant in Maharashtra state. It is expected to increase the company's EBITDA profit by around \$2 million per annum



through four percent higher casting speeds, time savings of one working day per month and additional output equating to 24,000 tonnes a year.

This application uses all standard communications protocols, employs ABB's multi-layered defence-in-depth approach to cyber security and is compatible with both ABB and third-party systems.

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Salvagnini has had a change of air

Nitrogen, oxygen or compressed air? The choice of the best assist gas for laser cutting depends on the material to be cut, its thickness, the required cutting speed and especially on the final application of the component, which brings with it some specific requirements in terms of cost and quality. Pierandrea Bello, Salvagnini product manager for laser technologies, talks about cutting with compressed air

The two Salvagnini laser product lines are both based on fibre technology and are natively setup for cutting with nitrogen and oxygen: L3, a versatile system intended for transversal use, whatever the applications, materials and thicknesses and L5, a highly performing, high-dynamic system for thin and medium-thin material. Salvagnini was also one of the first companies to believe and invest in cutting with compressed air, which is bringing very impressive results especially in terms of running costs. Why?

“Fibre sources have revolutionised the items that make up the hourly cost of laser systems and the impact that each of these has,” explains Pierandrea Bello. Their high efficiency has drastically reduced energy consumption, while their intrinsic features have reduced the costs of routine and extraordinary maintenance. The faster cutting speed has also reduced processing times and therefore the cost-per-part. The cost of the assist gas was one of the few items that remained unchanged.”

It is fundamental to remember that cutting with compressed air is cheaper than with nitrogen and this is all the truer when the cost per m³ of nitrogen increases: the



higher the cost of nitrogen, the more cost-effective cutting with compressed air is. It is therefore natural that the use of compressed air as an assist gas is one of the most interesting hot topics in laser cutting.

The evolution of ACUT, the Salvagnini

option that extends the possibilities of the L3 and L5 and allows cutting with appropriately treated compressed air, has been rapid. Depending on the source power, it can now cut thicknesses of up to 20 mm. The market response has been more than positive, over 95 percent of laser systems supplied in 2021 were equipped with this option. Without forgetting APM, the compact, turnkey device that is complementary to ACUT, connects directly to the pneumatic supply to work in the best possible conditions.

“This is an important figure but it is not in itself sufficient for understanding how many customers actually cut with air,” Pierandrea Bello says. “This is why we take advantage of the data from LINKS, the proprietary Salvagnini IoT solution that is used to monitor machine performance in real time and conduct analyses.”

Performance = material/thickness

Starting from a sample of a few hundred laser cutting systems active in the last three years, found all over the world and connected in the Cloud, Salvagnini has at its disposal a significant database for reading and interpreting the market. The



Vicenza-based Group records and analyses system performances with different models, sizes, layouts and power sources, which provide consistent production data. It is talking millions of sheets produced and hundreds of thousands of hours of actual production time.

"The trend of cutting with compressed air is growing significantly," Pierandrea Bello continues. "Between September 2020 and September 2021, compressed air was used to cut 40 percent of all sheet metal, using 29 percent of the total effective production time. In the preceding 12 months, these values were respectively 31 percent and 22 percent, while between September 2018 and September 2019 they were 27 percent and 18 percent. This means that in two years, compressed air has increased its share of total use by over 10 percent, both in terms of the number of sheets cut and the actual production time. We believe this evolution has come about partly thanks to the development of ACUT and we are convinced that these numbers are destined to grow more and more. Above all at the expense of nitrogen."

According to Salvagnini data, it is thin sheets, up to 2 mm/sec, that are most commonly cut with compressed air.

"Whatever the material being cut, with low thicknesses, the speed and quality of cutting with compressed air are comparable to those of cutting with nitrogen. Performance on medium thicknesses depends on the material," Pierandrea Bello states. "This is also why we analysed the materials most commonly used between September 2020 and September 2021, to get some ideas. Moreover, the new features introduced between 2020 and 2021 particularly impact medium thicknesses. We are aware that these will begin to affect the production data for 2022 and expect a change in scenario."

In the reference period, 92 percent of the galvanised sheet metal in the sample were thin sheets. The most common gas used for cutting these sheets was compressed air, in 54 percent of cases. A very similar parameter is also recorded for mild steel less than 2 mm thick, which in 53 percent of cases was cut with compressed air.

"However, compared to galvanised steel, mild steel has a wider range of uses," Pierandrea Bello adds. "Thin sheet metal represents just 65 percent of the total, while the rest are medium and large thicknesses. The use of compressed air is making its mark."



Among the other materials, it is interesting to examine aluminum, which has a balanced mix of thin and medium thicknesses. The performance of cutting with nitrogen and with compressed air is similar. The percentage of sheets cut with air is constant, close to 50 percent, whatever the thickness.

Pierandrea Bello says: "But let's also examine the case of stainless steel. Compared to other materials, the percentage cut with compressed air is lower, but we're still talking of around 30 percent of the total sheet metal."

Compressed air and its fields of application

Interesting data, but is it sufficiently accurate for steering the investments of those looking for a laser system suited to a specific production context? At this point, a second question springs to mind: how is compressed air used in the various fields of application?

"In the HVAC world, 92 percent of sheet metal is thin," Pierandrea Bello explains. "The reference material is galvanised and reaches a share of 78 percent of the total. This is the ideal combination for compressed air, which in this sector has a 57 percent share of the total. In our experience, we can say that compressed air is the most common assist gas in the HVAC world."

"A similar situation can be seen in the world of refrigerators. 95 percent of the sheet metal machined is thin. The reference material is again galvanised and reaches a share of 63 percent of the total. In this sector, too, the material/thickness combination is ideal for compressed air, which has become the assist gas most commonly used by our customers, who cut 55 percent of their sheet metal with ACUT."

"The metal furniture sector has some peculiarities which set it apart from HVAC and refrigerators. The percentage of thin sheet metal is below 82 percent of the total, a much lower share. The reference material is mild steel, which reaches a share of 84 percent of the total. Despite these differences, in the metal furniture world too, air has become dominant, with 61 percent of the sheet metal cut."

"I would also like to say a few words about the complex sector of job shops, which is much more varied than the industries we have just mentioned both in terms of the mix of thicknesses and the materials used."

Among job shops, nitrogen remains the most commonly used gas, but compressed air is making its mark. Today 25 percent of sheet metal in our sample is cut with air."

To conclude

"All in all, compressed air is becoming increasingly popular with our customers," Pierandrea Bello explains. "For some materials and thicknesses and, in some industrial sectors, it is already the cutting technology most commonly used by our customers and we believe the share will increase further."

For this reason, too, Salvagnini is working on several developments that will soon be available to provide cutting with compressed air with a whole series of intelligent functions that are already available for other technologies.

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Precision fabrication and prototype evolution with Prima Power 3D fibre lasers

Prima Power Laser Next and Rapido 3D Laser cutting machines

From humble beginnings to top supplier of precision metal fabrication, prototype manufacturing and short-run production for Tier 1 suppliers and OEMs in the Midwest, Duggan Manufacturing looks back on 20 years of hard work, smart investments and great customer service with Prima Power at its side.

Friends Rodney Westich and Tony Pinho had many years of experience in the automotive industry and a common goal: to build a prototyping business that would better service their customers. In 2000, they took a leap of faith and asked friends and family for money for their new venture. They purchased a few used machines and began operating an automotive specialty sheet metal prototype and limited production manufacturing company out of a former dairy barn and welding shop in Almont, Michigan in the USA.

From the onset, Duggan strove to take on challenges like labour-intensive and tight-tolerance parts that few competitors wanted to tackle. While not always the most desirable, these jobs became an opening for a new, hungry company to create a solid reputation for going the extra mile and giving unprecedented attention to detail: an approach that carried over to Duggan's DNA and remained unchanged over the years, as it grew to today's 90 employees working in a main facility of 72,000 sq ft and a satellite building of 28,000 sq ft.

"We devised a plan to get business rolling and, from that point on, it's been a steady

reinvestment plan for the latest machine technology," explains Rodney Westich, founder and Principal. "We put as much money back in the company as possible." A large part of that investment plan has been dedicated to Prima Power 3D fibre lasers.

Rodney Westich continues: "When we began our search for lasers, Prima Power was very helpful and open. They arranged for us to visit other customers who were doing laser tube cutting and we knew we were looking at something special. Their lasers are versatile and robust, with high uptime but if there is a problem, Prima Power's service department responds quickly and with excellent telephone support."

Duggan purchased a 2 kW Prima Power Rapido fibre laser in 2010 and another in 2011. The machine is equipped with a fibre laser source with different powers, according to the type of production. The fibre laser with high-energy efficiency, eco-compatible use and no maintenance gives the greatest benefits in large series production. Many applications take advantage of this source, resulting in lower cycle times and reduced cost per part.

"We had such great results with the two Prima Power Rapido fiber lasers, there was no second-guessing in what we were going to do when we needed a production laser with a turntable," says Duggan's president, Tony Pinho. "We purchased the Prima



Power 4-kW Laser Next in 2016. We are not a huge company, but our three Prima Power lasers allow us to punch above our weight, meaning we have much more influence than we anticipated, because they give us the same attention that you would expect for a large customer with multiple machines."

Time was tight when Duggan purchased the Laser Next. Tony Pinho adds: "Prima Power coordinated everything, from getting it built in Italy to shipping and installation. They shortened the initial schedule from 24 weeks from the order to 14, which really helped us."

"In 2010, we were the first sheet metal prototype company in the area to have fibre lasers," continues Rodney Westich. "It was the best choice for us because it reduced maintenance, overhead costs and even the required floor space. Our three Prima Power fibre lasers comfortably replaced five CO₂ machines, as they wore out and keep us competitive. This type of key investment definitely helped us grow."

Duggan now serves a wide variety of industries, including automotive, battery technology, defence, aerospace, printing, racking and material handling, off-highway trucking, and robotics. "Prima Power equipment allowed us to diversify," concludes Tony Pinho.

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Unifabs strengthens 'design to delivery' offer with investment in new AMADA machine tools

Nuneaton-based Unifabs has installed a brand-new AMADA REGIUS high-speed CNC fibre laser profiling centre with load/unload automation and storage. The company, which is targeting 25 percent growth in 2022, says the machine has already improved laser cutting speeds by 50 percent for certain parts. To further improve its 'design to delivery' offer for customers, the company has also placed an order for a new AMADA HRB-ATC, the first mid-range press brake in AMADA's portfolio to feature automatic tool-change capability.

Founded in 2007, Unifabs has grown into a £12 million turnover business with 125 people. It supplies precision sheet-metal parts to an enviable customer base of blue-chip manufacturing companies across a host of industries.

"Our goal is to be much more than just a supplier of sheet metal fabrications and parts," says managing director Tom James.

"We want to be a manufacturing partner to our customers, supplying a start to finish service. Whether we're supplying sheet metal components just in time to a manufacturing line, or controlling the entire production process on a contract manufacturing basis, we operate as an extension of our customers' business."

65 percent growth

Unifabs has seen growth of around 65 percent over the past two years and today operates from a single site with five factories that total 52,000 ft² of manufacturing space. "We don't specialise in one particular sector, but strong performing industries right now include HVAC, catering equipment and construction," says Tom James. "To ensure timely deliveries to our customers, we continuously invest in the latest manufacturing technologies."

A case in point centres on the company's laser cutting capacity, which was recently struggling to keep pace with rising demand. "Even though we have an AMADA FOL-AJ 4 kW fibre laser with AS LUL loading system

and an AMADA EML-3610NT punch-laser combination with MP loading system, we were still outsourcing a lot of laser cutting," explains Tom James. To help improve lead times for its customers and regain control of its parts, Unifabs decided to invest in another laser cutter.

Maximising productivity

"We looked at different models but, along with the increased processing speed we really liked the automated setup features on the AMADA REGIUS, which we knew would help to reduce setup/inspection time and maximise productivity," says Tom James.

Automatic inspection on the REGIUS utilises technology such as the AMADA i-Nozzle Checker to assess nozzle damage and circularity. If the nozzle requires changing, against a predetermined set of parameters, this will happen automatically via the machine's 16-station nozzle changer, negating the need for subjective operator judgement. A further function of the i-Nozzle Checker is automatic alignment of the nozzle centre if or when required.

Installed in November 2021, the AMADA REGIUS at Unifabs is primarily processing mild steel, galvanised steel and zintec from 1 to 8 mm thick. The machine features an AMADA ASLUL-3015 for the automatic loading and unloading of sheets and the storage of raw material, ensuring uninterrupted production runs and optimal machine utilisation. Typical batch sizes are in the region of 50 to 200. At present the company is running a double shift during the week, plus a weekend shift.



"The machine is very easy to use and has several process monitoring systems that do much of the work for operators," says Tom James.

REGIUS features AMADA's new i-Process Monitoring system, which checks the wavelength of reflected light in real time to provide a reliable indication of good or poor cuts. Automatic head collision recovery is a further function of i-Process Monitoring. Machines without this function simply stop and issue an alarm, wasting valuable time.

More power and faster parts

"The REGIUS is a 6 kW laser, whereas our other AMADA laser capacity is 4 kW," says Tom James. "Combined with the more intelligent head movement, we find that any parts over 4 mm thick are around 50 percent quicker to cut, shortening lead times for customers without any compromise in quality. It's a great step forward for Unifabs and our partners. The REGIUS is also more efficient and uses a lot less power than our AMADA FOL laser cutter, such is the advance in technology."

The high-specification REGIUS CNC fibre laser profiling centre is not only the fastest in AMADA's portfolio, but the first to integrate a number of key technologies: linear drives in all axes; the company's all-new laser integration system and variable beam control technology.

Beyond laser cutting, Unifabs offers extensive sheet metal fabrication



capabilities that include design, CNC punching, CNC bending, welding, powder coating and final assembly.

Automatic tool change

Bending is a core business function, which is why Unifabs has placed an order for a new AMADA HRB-ATC. Adding to the company's existing seven AMADA CNC press brakes, HFE and HFP models, the HRB-ATC is the first at the company with automatic tool change capability.

"We manufacture a lot of samples, prototypes and small batch runs to help get components ready for serial production," explains Tom James. "We have 10 people in our CAD team, so a lot of our work comes from the product development side of our business. However, these parts often have long setup times, so we're really hoping that the new press brake's ATC capability will have a big impact on throughput in this area. We'll program a prototype part offline using AMADA software, send it to the new HRB-ATC and hopefully be folding metal within a few minutes."

AMADA's HRB-ATC features a full size ATC, offering exactly the same number of tool storage racks as the company's



high-end HG-ATC press brake. The machine comes with a package of AMADA tools based on an assessment of the customer's manufacturing requirements. Importantly, the HRB-ATC is completely compatible with AMADA AFH standard tool sets. As a result, any existing customer using these tools can load them manually to the new machine if desired.

Direct customer benefits

Tom James concludes: "The new AMADA investments support our growth strategy

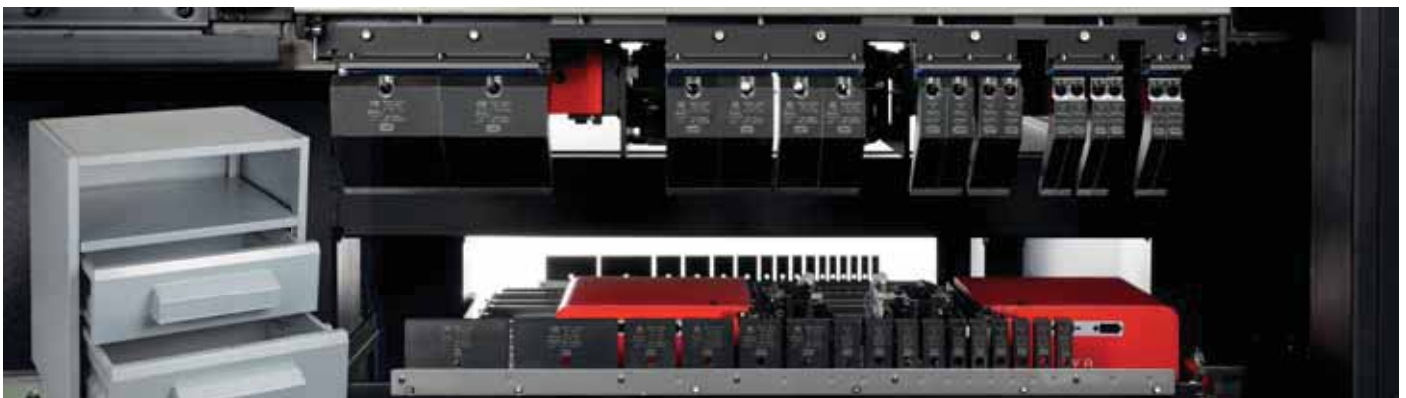
and mission to continue as a trusted contract manufacturing partner to our customers. While our customer service and communications set us apart from competitors, it's our investment in new technology that can impact factors such as lead time, providing a direct benefit for clients."

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Rapid growth prompts further TRUMPF machine investment

Staffs Laser, which since its inception just three years ago has grown into a £4 million turnover company with 25 employees, has installed its second 6 kW TRUMPF TruLaser 3030 fiber laser cutter. The two TruLaser 3030 machines operate alongside one another at the company's new 40,000 ft² facility in Eccleshall, Staffordshire.

"Previously, we were running a TruLaser 3030 fiber and a TruLaser 2030 fiber on single shift, but we are getting busier and busier all the time," states the company's founder, Eddie Hopkins. "One of our specialities is short lead times, regardless of order quantity there is no minimum. To maintain this USP moving forward we opted to part-exchange our 2030 for a second TruLaser 3030 fiber, which has more power and speed, and introduce a second shift for laser cutting."

Eddie Hopkins says it would take 51 seconds to change the beds on its previous TruLaser 2030, but it takes just 17 seconds on the 3030: "Since we perform around 100 pallet changes a day, saving over 30 seconds each time, it soon adds up to around a couple of hours over two shifts," he explains. "We can do a lot with two extra hours."

Staffs Laser does not focus on individual sectors, but serves industry as a whole. Current buoyant sectors include rail, yellow goods, street furniture and construction. The company processes all material types,

including mild steel, up to 25 mm thick, stainless steel, 25 mm, aluminium, 25 mm, copper, 10 mm, brass, 10 mm and some titanium.

"Having the latest laser cutting technology allows us to be extremely competitive within the market," states Eddie Hopkins. "TruLaser 3030 machines are ultra-reliable, which means we can always supply customers with the highest quality products, on time. With TRUMPF features such as BrightLine, high-quality cut edges in thick materials, CoolLine, constant-temperature cutting in thick materials, Flyline, ultra-productive hole grid production and TwinLine, common-line cutting, we can cut parts that we previously thought impossible."

The Highspeed Eco function is another game-changing benefit, generating savings in gas consumption of up to 70 percent during high-speed cutting, without any compromise in quality.

Eddie Hopkins says: "Fibre lasers utilise a shorter wavelength with the laser beam, which allows them to transfer energy into the material at a faster rate and hence cut quicker. This allows us to be more competitive than other suppliers who use older CO₂ lasers."

Along with investment in new TRUMPF laser cutting technology, the company's move to new 40,000 ft² premises in August 2021 has provided a further boost. Staffs



Laser previously utilised four separate units totalling just 9,000 ft² of floor space. Now under a single, much larger roof, the company has optimised its work flow. The two TruLaser 3030 fiber machines sit next to one another on the shop floor and provide high levels of flexibility. This attribute is important for Staffs Laser as, like many subcontractors, it typically only has three to four weeks visibility on incoming work. Agile software is also critical to cope with a large amount of batch sizes in the region of 30-50 off.

"As well as newly-installed MRP software, we use TRUMPF TruTops Boost software for 2D/3D design and programming, which is brilliant," states Eddie Hopkins. "The auto-nesting functionality saves a lot of time for our planning staff. I've tried used auto-nesting before in other software suites and found that nesting manually actually turns out to be more efficient and gives better material utilisation, but this certainly isn't the case with TruTops Boost."

Aside from laser cutting, Staffs Laser offers a myriad of secondary processes, including folding, drilling, tapping, rolling, bar bending, welding, vibratory deburring and sandblasting.

"Within our new unit we're also planning to introduce powder coating over the coming months, which will save outsourcing this operation and reduce lead time," adds Eddie Hopkins. "Hopefully we can soon offer a complete bespoke package to our customers."

He concludes: "We always get very good service and aftercare from TRUMPF, which is another reason, on a long list, not to look elsewhere."

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B&P Fabrications grows with more gas from MSS Nitrogen

Leicester-based B&P Fabrications has recently upgraded its high-pressure nitrogen generation system with the latest specification MSS Nitrocube systems. Having successfully grown its business over recent years and added more powerful laser cutting equipment to its fleet, more nitrogen was needed to keep up with the growing demand.

The original MSS Nitrocube systems had given many years of reliable supply, so it was a natural step for B&P to ask MSS for a suitable upgrade solution. Chris Fenwick, MD at B&P comments: "The old nitrogen system has given us excellent service but we decided it was time to increase the system capacity. Space was very restricted on site, so we needed a high output solution with minimal footprint and maximum storage capacity."

MSS supplied the Nitrocube 7 system, which is a dual generation system that provides 100m³ Nitrogen/hour. This is combined with multiple bundled high-pressure storage with capacity of 2,300m³ @300bar.

The new Nitrocube 7 system provides high pressure nitrogen at 99.98 percent purity, which is an ideal assist gas for all general laser cutting work. The latest generation Nitrocube is more efficient than ever, using 25-40 percent less energy to generate higher purity nitrogen than achieved with older systems. The system



supplied to B&P is one of the highest output systems supplied in the UK to date and features very powerful dual Nitrocube technology.

This is a dual Nitrocube system, providing a minimum of 50 percent operating redundancy for any system outage for service or breakdown, so it gives a great level of confidence to the customer. The new system also features MSS's unique touch screen control panel that allows remote system performance and status monitoring.

Chris Fenwick says: "The installation work went extremely smoothly, MSS planned all aspects of the work to minimise disruption and got us back up and cutting again exactly as had been planned. On site nitrogen generation works very well for B&P, as it gives us control over our supply and helps with our push to reduce our carbon footprint."

MSS sales director Chris Smith states: "This was a challenging installation and I'm very pleased how well it went. We were able to provide B&P with a very cash friendly rental option that allowed them to upgrade their old system without any significant impact on their current capital budget.

"The latest generation MSS Nitrocube is the most compact and most flexible system available anywhere in the world. We have over 400 systems like this installed in the UK already and the popularity of this product is growing very quickly in a number of important overseas markets as well. This latest product incorporates all we have learnt from high pressure nitrogen systems for laser cutting applications over the past 20 years."



MSS was formed in 2003 with the aim of offering a complete service to the laser cutting industry, with the company's excellent reputation for servicing all makes of laser cutting machine providing the springboard for its growth.

MSS Lasers has become a leading specialist in the sale of fully reconditioned laser systems and a UK market leader in the supply of high-pressure nitrogen generation equipment to the laser industry.

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Taylor Made see the light with new laser investment

A strong order book has led a Thatcham-based manufacturer to invest in new state-of-the-art laser equipment and move to a new facility.

Taylor Made Fabrication (TMF) has invested in a Mazak OPTIPLEX NEXUS FIBER 3015 III to improve processing speeds and increase production capacity in order to meet demand.

TMF director Ray Baker says strong demand led the company to approve the investment: "We're always busy and, given our levels of demand, we felt that it was important to upgrade our laser cutting technology. Our previous unit was becoming slower and needed more maintenance to keep operational. We can't afford any downtime or let customers down, so the new investment, which has coincided with our move to a new facility, is very important for the future of the company. Mazak's OPTIPLEX NEXUS ticks all the boxes for us in terms of price, performance and capacity."

The OPTIPLEX, equipped with a powerful 3.0 kW laser, has dramatically improved



production throughput as Ray Baker explains: "We've been able to make significant improvements in processing speed and also begin processing thicker aluminium and stainless and mild steel which has opened doors for us with new customers."

Founded in 1992, TMF provide a wide array of services in the general contracting space alongside its precision laser cutting offering, including metal fabrication, punching, folding, welding and guillotining. The company manufactures for multiple industries, producing parts to order through its fully-equipped CNC machine workshop and online CAD/CAM facilities.

"One of the main things that stood out

about the OPTIPLEX NEXUS was the flexibility offered by its twin pallet design, as opposed to our previous machine, which was only equipped with a single pallet," adds Ray Baker. "As we work in general subcontracting, we're always busy. Being able to save time on loading in new sheet metal while we take out the completed workpieces has made a significant improvement to our productivity."

Alan Mucklow, managing director UK & national distributor sales at Yamazaki Mazak, comments: "Mazak is a byword for quality in the laser processing market and we're pleased to have helped Taylor Made Fabrication upgrade their existing machinery and take on new business. The OPTIPLEX NEXUS FIBER 3015 III was designed to offer market-leading performance and precision, while also being extremely energy-efficient."

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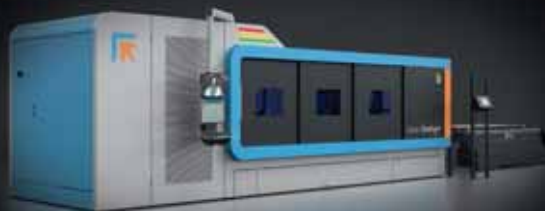


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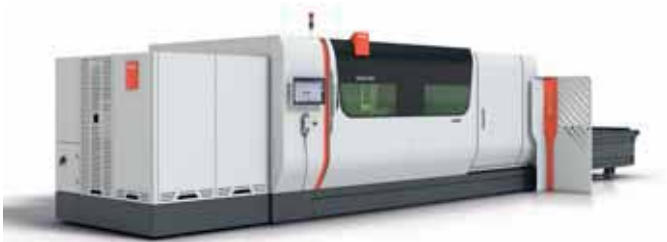


Further additions strengthen Team FC

The goal of FC Laser has always been to provide a world class service to current and future business partners. To ensure this continues long into the future, it has made further additions to its extensive capital equipment capability portfolio and production facility.

The Bystar 6225 offers fast and precise cutting for maximum productivity, ensuring unrivalled production efficiency. High-speed cutting in a class of its own, with up to 15 kW of laser power provides unbeatable precision cutting of 3 mm to 15 mm thick mild steel with an average 50 percent speed advantage over 10 kW output. Providing maximum flexibility for large volume or individual piece customer requirements, aluminium, non-ferrous metals or steel, the high-performance Bystronic cutting head excels with maximum precision in both thin and thick sheets and profiles.

The unique BeamShaper provides clean cutting edges and high process reliability in a wide variety of steel sheet qualities, up to 30 mm. With the Advanced Applications option, 15 kW of laser power now enables expanded applications in steel and aluminium of up to 50 mm. Using a 21.5-inch touch screen, Bystronic's ByVision cutting software is as simple to operate as a smartphone. With its wide range of automated solutions and maximum machine efficiency, process reliability is guaranteed even during unmanned operation.



The new Bystar 6225 Bystronic fibre laser



With the ByTower® loading system, material handling is at a minimum to maximise production efficiency, while the compact storage tower provides many efficiency benefits which include: automatically loaded and unloaded shuttle table, which ensures the entire process is significantly more efficient; frequently used materials are immediately available because they are stored and directly accessible, significant reduction in labour intensity; the shuttle table is freely accessible.

Extraordinarily flexible and simple to operate, the storing of raw material and removal of processed sheets is easy and efficient, while the return transfer of cut sheets is automated.

FC Laser's philosophy is simple: invest in the best people, technology, and materials. With these, it can create working practices to ensure it delivers to customers. The quality of its products and service delivers those products to a standard that exceed customer expectations.



Installation of a ByTower automated loading system

FC Laser employee ownership trust

All members of FC Laser have an added incentive to push the business forward, primarily because they own it. FC Laser is one of under 500 businesses in the UK completely owned by its employees. Every member of the business has a vested interest in its success and this level of drive is passed onto every one of its customers.

FC Laser is committed to helping its customers translate laser cutting into real business value. It has invested in cutting edge technology to ensure it delivers cost-effective solutions. The company looks to build strong relationships with all of its customers to ensure it understands their needs and always delivers.



Above image supplied by Abacus flooring

Team FC will celebrate its 10 Year anniversary by doubling its site size to over 40,000 sq ft. Currently in stage two of development, it will be fully operational in June 2022

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Bringing Nukon's precision laser cutting technologies to MACH

Ingenium Integration Ltd, the sister company of UK-based tube bending machinery specialists Unison Ltd, will be showcasing the Nukon range of precision fibre laser cutting systems at MACH 2022.

Visitors to the stand will be able to see a Nukon Eco Speed Pro Line 315 4kW 2D fibre laser machine in action and discover why Ingenium Integration believes Nukon machines are the ideal choice for first-time laser users, businesses adding value to in-house manufactured products and subcontractors requiring high-performance machines for the most demanding of laser-cutting applications.

"For such premium quality machines, Nukon fibre lasers are incredibly accessible," comments Ingenium Integration sales manager, Steve Haddrell. "Several models also have an extremely compact footprint, making them well-suited to production environments where floorspace is at a premium. Additionally, companies buying a Nukon fibre laser cutting system from Ingenium Integration can expect to receive the same uncompromising levels of service and

support as enjoyed by users of Unison tube bending machines."

High spec standard features

The Nukon fibre laser range includes 2D, 3D (5-axis) and laser tube cutting machines. High spec standard features include: nLIGHT fibre lasers with adaptive beam optimisation and Lantek Expert software, one of the most advanced CAD/CAM nesting software packages on the market today.

Available in a range of power options and sheet sizes, Nukon's 2D fibre laser machines combine high performance with high-efficiency. 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. 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.

Before being appointed as Nukon's exclusive UK and Ireland distributor in 2021, Ingenium Integration spent time searching the market for a range of high-quality, accessible laser cutting technologies that would be of significant interest to manufacturers. Steve Haddrell concludes: "We believe we have found such a product range in Nukon."

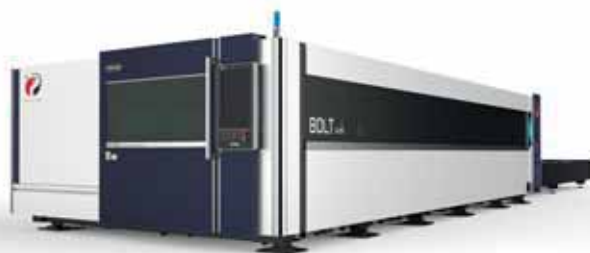
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Tight weld-flatness tolerance secures multiple sales of PTG dual weld-head FSW machines to electric vehicle OEMs

Just two years after the launch of its range of Powerstir 'dual weld-head' friction stir welding machines, UK-based Precision Technologies Group (PTG) has reported achieving double-digit sales of these specially developed FSW technologies for electric vehicle OEMs.

Designed specifically for use in the volume production of automotive battery tray floor assemblies from extruded aluminium panels, the company's dual weld-head process is aimed directly at manufacturers of skateboard chassis structures and ensures that a tight weld-flatness tolerance is achieved during battery tray floor construction.

PTG has been a leading name in the manufacture of friction stir welding machine tools for transport applications ever since its Powerstir range was launched at EMO Hannover some 20 years ago. More recently, however, it has used its considerable knowledge of the FSW process to assist automotive OEMs in producing lightweight, robust and aesthetic components for both Battery Electric Vehicles (BEV) and Plug-in Hybrid Electric Vehicles (PHEV).

"We are delighted to have achieved this level of sales for our new dual weld-head Powerstir machines in such a short space of time and during such a challenging trading period for manufacturing industry," comments PTG sales director, Mark Curran. "Clearly, the benefits of the PTG Powerstir dual weld-head process have made us a

major contender among organisations that are looking to invest in advanced FSW technologies for the manufacture of electric vehicles."

Ensuring a tight weld-flatness tolerance

A tight weld-flatness tolerance, as provided by PTG Powerstir dual weld-head machines, is essential to ensure that each EV battery cell sits perfectly level within its housing. The PTG dual weld-head method achieves an even and stable welding process, something that is made possible thanks to PTG's unique 'matched' dual-force control systems and balanced upper and lower head welding parameters. The result is exceptionally stable friction stir welding by both the upper and lower weld heads, producing matched weld seams with balanced heat input. This, in turn, minimises post-weld distortion and equips each welded assembly with a significantly improved flatness tolerance when compared to existing conventional single-side FSW techniques.

High-output production cell

As aluminium extrusion lines usually produce panels of 300 mm to 600 mm wide, PTG has also developed a fully automated, high-output Powerstir FSW production cell for the rapid friction stir welding of multiple extrusions, to create single structures for fabrication into battery tray floors. These structures are typically up to 2.4 m wide.

"Our dual weld-head FSW techniques,



whereby both sides of an extrusion are welded simultaneously, not only remove the time-consuming process of lifting and turning extrusions between welds, but also allow for equal heat dispersion which results in minimal distortion," explains Mark Curran. "In the PTG Powerstir dual weld-head FSW process, typically four to 12 individual child-part extrusions are brought together for assembly. Following gantry loading, each extrusion is automatically positioned and clamped ready for friction stir welding, after which the partially completed vehicle component is automatically repositioned, ready for the next panel to be welded in place.

"In addition to providing automotive OEMs with a state-of-the-art means of joining metals and achieving extremely high-strength results, it is also important to consider that in many instances, the use of friction stir welding also allows for reduced wall thickness; an important aspect in reducing vehicle weight," he adds. "As the friction stir welding process generates very little heat, the crystalline structure of the metal remains unchanged, retaining its original strength. There is no need for inert gas, no need for heat-treating post weld and no requirement for additional surface finishing."

PTG is widely considered to be a leader in the development of FSW technologies for transport applications. Organisations involved in the manufacture of aerospace components and the production of aluminium carriage panels for high-speed trains were among the first to recognise the benefits of Powerstir friction stir welding.



Working with 5000 and 6000 Series aluminium alloys and magnesium alloys from 3 mm to 6 mm in thickness, PTG is currently developing new FSW processes for several automotive OEMs. Through the use of industry standard CNC systems, equipped with PTG Powerstir software, data-logging and interpolation technologies, 2D welding, guided by laser tracking, can be carried out on precise tool paths with force control ensuring consistent welded seams. QR codes are used to identify each extrusion before welding commences. Each completed panel is then DMC coded to identify the panel, for complete and ongoing traceability throughout the manufacturing cycle.

Coolant units and body panels

In addition to building Powerstir machines specifically for the production of battery tray floor assemblies, PTG is also creating FSW techniques for the production of coolant units, control box panels and car body panels, as well as body panels and components for commercial vehicles. Through its recently opened friction stir welding research centre, the company is also assisting a number of organisations in

developing FSW processes for specific manufacturing challenges.

High-strength joints with minimal Heat Affected Zone

Friction stir welding combines frictional heat with precisely controlled forging pressure to produce extremely high-strength joints that are virtually defect free. Due to the very low welding temperature, mechanical distortion is practically eliminated, with minimal Heat Affected Zone (HAZ) and an excellent surface finish. Friction stir welding transforms the parent metal from a solid to a plasticised state. This occurs during a process that involves mechanically stirring the materials to be joined together, to form a high integrity, full-penetration welded joint. The Powerstir FSW process is effective on flat plates, cylindrical components and even on parts of irregular thickness. Although used primarily for joining aluminium, the Powerstir process can also be applied to magnesium, copper, titanium and steel alloys.

Incorporating the brands of PTG Holroyd, PTG Powerstir Friction Stir Welding and



Holroyd Precision Rotors, PTG has established itself at the forefront of high-precision machine tool design, build and supply for specialised applications. The range includes advanced machine tools for the production of complex helical components such as compressor rotors, pump screws and high-accuracy gears, and Powerstir machine tools for friction stir welding advanced alloys used in transport applications.

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Ready for every challenge

The iWave from Fronius is an intelligent, high-end series that sets new standards in quality, flexibility and connectivity. The TIG power source enables perfect weld seams to be produced on all weldable materials. It also possesses multi-process capability and comes with a host of innovative features. The modular system design assures a customised solution whatever your welding requirements, both now and in the future.

Fronius developed the iWave to enable the very best TIG weld quality and flawless results to be produced on different metals. The innovative Option CycleTIG provides maximum control over the arc and targeted heat input. Further highlights include improved ignition control and greater ease-of-use with intuitive operation.

Whether welding pressure vessels, pipes or the most demanding requirements in medical technology and food and drink production, in fact all applications where avoiding pores and temper colouration is critical, the iWave is the perfect choice. The series is available as of now in power categories 190 A to 500 A.



Multiprocess capability is important if you are switching between different welding tasks on a day-to-day basis. The new iWave really proves its worth here with sophisticated TIG technology and is ideally suited for manual metal arc welding, even with cellulose electrodes. The Multiprocess PRO option is a real winner, giving the user unlimited access to all MIG/MAG processes in power categories from 300 A. This makes the iWave a multi-talented all-rounder producing outstanding welding results with all welding processes.

"The iWave provides flexibility in that customers can individually choose the

specific functions they actually need from a range of modular welding packages. The customer also has the assurance that they can add to the range of functions as and when needed," reveals Manuel Rimpl, head of strategic product management at Fronius International GmbH. Starting with standard TIG or standard MIG/MAG applications, the iWave enables upgrades to the full Fronius range, including the Cold Metal Transfer (CMT), Pulse Multi Control (PMC) and Low Spatter Control (LSC) Welding Packages.

The iWave supports the main communication standards and is ready for Industry 4.0. Modern wireless connections give welders greater freedom and security, allowing them to exploit the full potential of the device. Peripheral devices, such as remote control or the high-tech Vizor Connect welding helmet, can be wirelessly connected via Bluetooth.

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Emerson marks 75 years of innovation in precision cleaning and welding technologies

Branson combines breadth of technologies and a problem-solving approach to deliver advanced solutions to automotive, medical and electronics industries worldwide

Emerson has celebrated the 75th anniversary of its Branson™ brand, a name that has become synonymous with ultrasonic technologies for plastics and metal welding and precision cleaning. The Branson portfolio has been a leader in the industry with expanded offerings beyond ultrasonics, developing nine other material joining technologies including laser, vibration and infrared welding.

Emerson marked the anniversary at its new \$49 million global headquarters for welding and precision cleaning technologies that opened in January. The new facility bolsters Emerson's continued innovation in advanced design, engineering and joining technologies that support such complex and fast-growing industries as medical devices, existing and new bio-based plastics packaging, electric cars and next-generation batteries.

"We are extremely proud of our history and how we revolutionised the use of ultrasonics in so many remarkable ways," says Vernon Murray, president of Emerson's assembly technologies business. "Our goal has always been to deliver proven performance, unequalled expertise and the broadest technology portfolio for material joining and precision cleaning applications. We look forward to continuing our stewardship in the field as we make advancements that benefit everyone."

The Branson brand traces its history to Norman G. Branson, a research engineer who founded a company in Danbury, Connecticut, in 1946 to harness the power of high-frequency ultrasonic energy for cleaning and degreasing applications as well as non-destructive testing and gauging. But it was ultrasonic welding, developed in 1963 at Branson Sonics and Materials and acquired by Emerson Electric Co. (Emerson) in 1984, that represented the real breakthrough for the company and for manufacturing. It set in motion a monumental change in the way plastics and later metals were joined.

Since its beginning, Branson has been driven by the spirit of innovation and today

ultrasonics is just one of many cleaning and joining technologies offered by Emerson's Branson portfolio. Other welding methods include spin and vibration welding, staking and swaging and a new patent pending "dynamic mode" of ultrasonic welding that can automatically adjust itself to part-to-part variabilities and unique materials. "Clean welding" approaches, such as Contoured Laser Technology, Clean Vibration Technology and Contoured Infrared Technology are being adopted with ever greater frequency.

Continuing the commitment

Given this depth of technical resources, Emerson application engineers are able to utilise a process-neutral approach to help manufacturers evaluate, select, implement, and optimise the right joining solution, regardless of the application or complexity. This high level of customer support is enhanced by the technological capabilities available at the new 146,000 sq ft Branson headquarters. The facility includes an expanded research and development lab, increased manufacturing space, a dedicated training workspace for seminars, and training classes, technical services and other resources.

The 75th anniversary represents a milestone that Emerson will recognise throughout the next several months as the company continues its path of inventiveness, delivering advanced Branson products to solve critical industry challenges.

For more information about Emerson's welding, assembly and cleaning solutions, visit: <https://www.emerson.com/en-us/automation/welding-assembly-cleaning>

Emerson, headquartered in St. Louis, Missouri (USA), is a global technology and engineering company providing innovative solutions for customers in industrial,



commercial, and residential markets. Its automation solutions business helps process, hybrid and discrete manufacturers maximise production, protect personnel and the environment while optimising their energy and operating costs. Its commercial and residential solutions business helps ensure human comfort and health, protects food quality and safety, advances energy efficiency and creates sustainable infrastructure.

Emerson is where technology and engineering come together to create solutions for the benefit of customers, driven without compromise for a world in action. As a global innovator, the company has a deep legacy of solving the most complex challenges facing modern life. It combines advanced technologies, expertise and an insatiable curiosity about the world around us to create sustainable solutions for the essential customers it serves.

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