

**Mills CNC at MACH 2020
Hall 19 - Stand 100**

Let's Go!

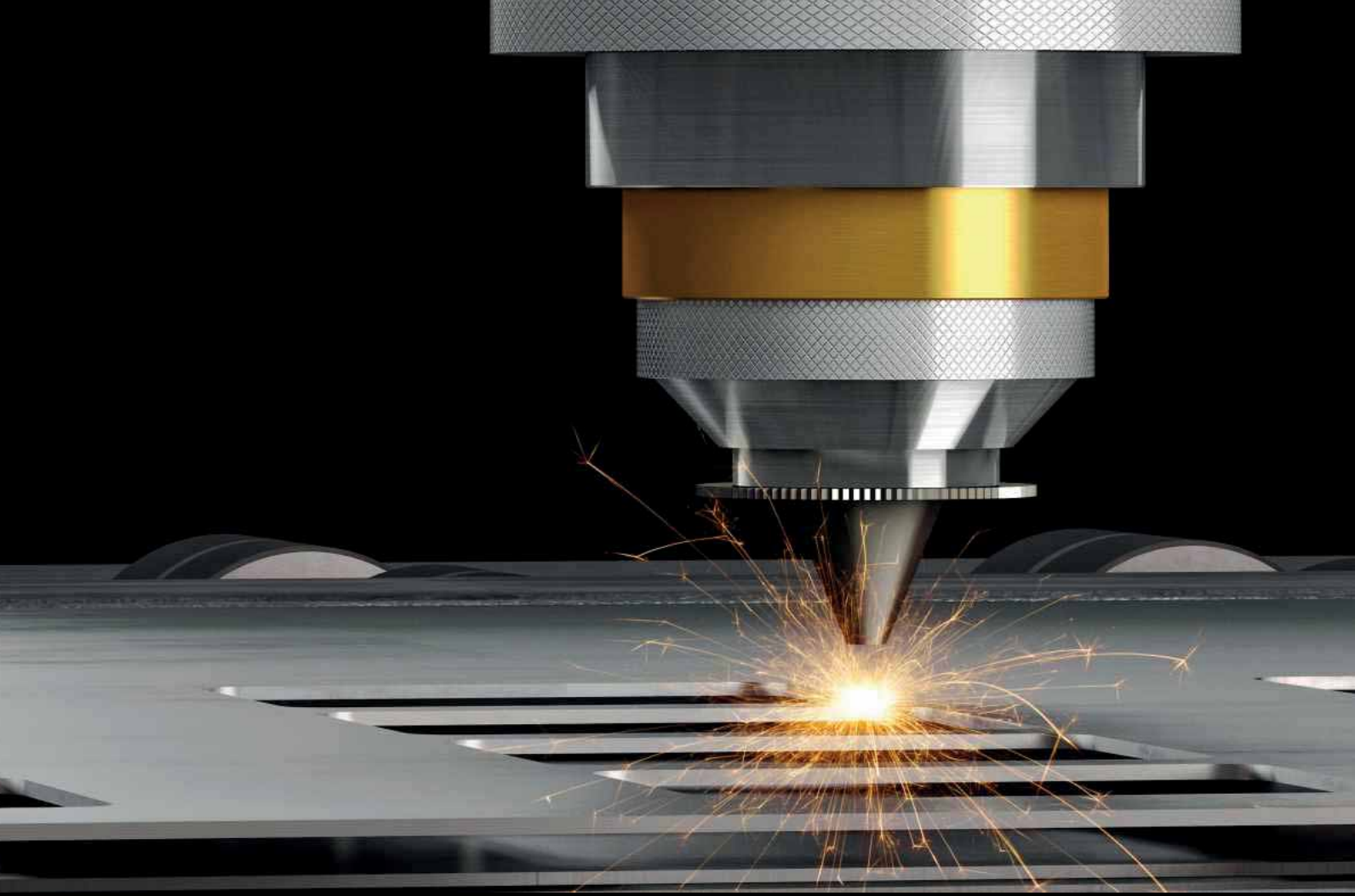
We're on our way to MACH 2020.

And, from the largest stand at the event, are showcasing 18 Doosan machines (many of which are making their UK debuts), an advanced SYNERGi automated manufacturing cell and a range of our latest Doosan cobots.

If you're looking to get your productivity, performance and profitability back on track we look forward to welcoming you onto our stand.

**To find out more about Mills CNC at MACH 2020
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- WORKHOLDING

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Let's go!

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, is showcasing a range of advanced machine tool and automation solutions on its stand at MACH 2020.

The 18 Doosan machines being exhibited feature a number of new models that are making their UK debuts at the event and include the DEM 4000, a compact, high-productivity vertical machining centre equipped with a high-speed 7.5 kW/8,000 rpm spindle and a 20 position ATC.

The DEM 4000 shares pride of place on Mills' stand with the company's latest high-performance 5-axis machining centres. The Doosan DVF 5000, first introduced into the UK in 2018, is integrated with a large-capacity Automatic Work Changer (AWC) for increased productivity. It is taking centre stage at the show alongside the DVF 6500 and the DVF 8000, two new models from Doosan's DVF, 5-axis range.



All three machines deliver unrivalled speed, accuracy, flexibility and process reliability. They are equipped with direct-drive spindles, up to 22 kW/18,000 rpm and are supplied with integrated thermal compensation systems for increased and long-lasting precision.

Many of the machines being exhibited feature in-built automation as standard, like the TT1300SYY and TT2100SYY twin-turret, twin-spindle turning centres with dual Y-axis capability on their upper and lower turrets.

Indeed, automation is a major theme underpinning Mills' attendance at MACH and is a key characteristic of the technologies being exhibited by the company.

A flexible, automated SYNERGi 25 manufacturing cell comprising a high-productivity industrial robot and a Doosan DNM 4500 vertical machining centre, powered and controlled by Mills CNC proprietary SYNERGi software, is being showcased.

From a collaborative robot technology perspective, a number of advanced Doosan cobots will be exhibited on the stand. These cobots, with their best-in-class dexterity and torque sensing capabilities, will be equipped with different end effectors, including integrated vision systems and will be performing multiple machine tool tending and pick and place operations.

Tony Dale, technical director at Mills CNC, comments: "We're making an Olympian effort to ensure that MACH 2020 is a landmark event for UK and Irish component manufacturers. Everything is well on track to make this year's show relevant, inspiring, memorable and rewarding for visitors.

"If you're a component manufacturer looking to compete and win on the global stage, visit our stand and get your performance, productivity and profitability back on track."

Mills CNC Ltd Tel: 01926 736736
Email: sales@millscnc.co.uk www.millscnc.co.uk

Stand: 19-100

A fertile environment for exhibitors to do business

MACH 2020 is being described as “the unmissable event for manufacturing technology suppliers”



Following on from the huge success of MACH 2018, which has already had upwards of £200 million worth of business attributed to it, the next edition of the show is looking to build on that success.

James Fudge, head of events at the Manufacturing Technologies Association (MTA), says: “MACH remains the market leader in the UK for manufacturing technologies exhibitions because we continue to refine our show and create a fertile environment for our exhibitors to do business.

“For the 2020 show, we have added new zones to the floor plans, so you will be able to continue to see a complete picture of the UK’s manufacturing sector. We have listened to our visitors and exhibitors to ensure we have the right balance of technologies. It is the unmissable event for manufacturing technology suppliers.”

Demand for space at MACH 2020 is in excess of what it was at the same point in advance of MACH 2018. The sales process for the show started during MACH 2018,

which saw a 50 percent increase in exhibitors re-booking on site to ensure they had space at 2020.

New zones

For MACH 2020, new zones have also been added to the floor plans to give a fuller picture to the UK market. These include a new Automation Zone, as well as a branded new Training Zone. The Training Zone, alongside the already established Education & Development Zone, will enable visitors to get a flavour of what a career in advanced engineering is like.

The Training Zone will present a clear picture of how visitors can upskill their current work force. With this in mind, MACH 2020 is pleased to announce that the University of Wolverhampton’s School of Engineering, based at its £10 million Telford Innovation Campus, is the first institution signed up to attend.

The University has a growing reputation for excellence in aerospace engineering and motorsport and is the only University race team to compete in the national Formula 3 Championship. Facilities at Telford Campus include a high value manufacturing suite, composite materials lab, wind tunnel and additive manufacturing suite.

James Selka, CEO of the MTA, says: “We are delighted to confirm the University of Wolverhampton will be at MACH 2020. It is

our mission to keep pushing boundaries within the sector and the only way to do this is through high-quality education and application of those skills. Wolverhampton has a growing reputation as a top-class institution and shares our values for promoting, developing and harnessing the skills of UK engineers.”

Syed Hasan, head of the school of engineering at the University of Wolverhampton, says: “We are really pleased to be attending MACH 2020. It is the perfect platform for us to showcase the excellent facilities and the range of engineering and manufacturing courses we offer at our Telford Innovation Campus.

“Manufacturing Technology is something we’re very focused on and being at the UK’s market-leading exhibition will provide additional opportunities for us to engage with future talent in order to help address the skills gap in the manufacturing and engineering sectors.”

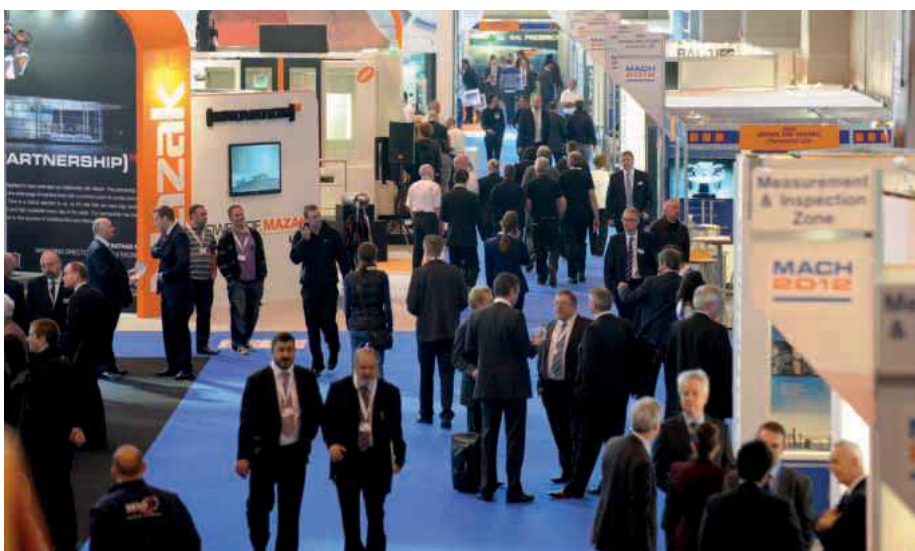
One-stop shop

MACH remains a leading exhibition due to the amount of live working machinery running at the show and the fact it has the widest selection of equipment on display. MACH 2020 will take place between 20th-24th April at the NEC in Birmingham and it is now the right time for manufacturing technologies suppliers to start formulating their plans for how they’re planning to be there.

The MTA was pleased to see that the recent budget announcement included the expansion of the Annual Investment Allowance from £200,000 to £1,000,000. This was a specific request from the MTA and will make investing in new equipment at MACH 2020 more cost-effective for the vast majority of visitors.

The show provides exhibitors with a real return on their investment by delivering an engaged audience with real purchasing power.

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





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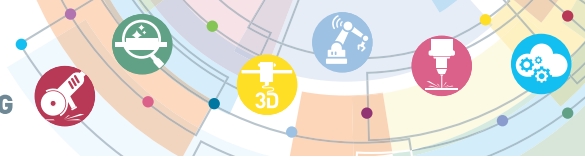


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MAPAL adds creativity to tool design at MACH

Introducing additive manufacturing to the realms of cutting tool manufacture offers design, performance and tool life benefits that in many circumstances are beyond the possibilities of traditional production methods. For some time, MAPAL has been introducing new 'additively manufactured' product lines and at MACH 2020 this will continue with a host of new additive solutions on its stand.

By reducing the weight of PCD cutting tools through additive methods, MAPAL is achieving significantly higher cutting data. As 3D printed cutting tool structures can be designed and manufactured to minimise weight without compromising strength or integrity, MAPAL engineers are increasingly pushing the boundaries of cutting tool design and development and this will be evident at MACH.

Demonstrating how MAPAL uses the advantages of 3D printing, the company will demonstrate its new bell tools with brazed PCD inserts. Frequently used in the hydraulic and automotive sectors, bell tools are the first choice for external machining of hose connections on turbochargers where complex contour requirements must be met with precision. This means that cutting tool production must be equally precise to ensure customers can achieve their cost-effective, precision machining requirements.



To meet the needs of end-users, MAPAL has optimised the existing, conventionally manufactured bell tool by integrating selective laser melting process into its manufacturing processes. This allows the inside of the cutting tool to be modified and, as a result, the tool is at least 30 percent lighter and tool life is increased by upwards of 40 percent, due to the enhanced vibration damping characteristics of additive manufactured tool designs. Customers using MAPAL's additive manufactured tools are witnessing productivity improvements in the region of 50 percent.

Additionally, MAPAL experts are using the 3D printing technology to optimise the cooling channels, ensuring that cutting fluid is delivered to the cutting area via the most efficient possible route. Using selective laser melting, the new tool geometry is printed on a highly precise tool body with an HSK-63 connection. The additively manufactured tool body is subsequently machined to provide the precise platform for the PCD inserts to be brazed into place and then cut to shape using a laser.

With additively manufactured cutting tools, reliable chip breaking and optimal machining performance is a necessity. This is why MAPAL will also be using the showpiece UK manufacturing event to introduce its newly developed inserts for the chip guiding stage when machining steel. When undertaking the fine machining of steel, long chips can prove detrimental to

machining performance and surface finishes, especially when machining with tools that incorporate guide pads.

To prevent long chips from wrapping around the tool and creating a negative impact on surface quality, MAPAL has introduced the new line of inserts with chip guides. The new chip guiding stage combats these very problems, credit to the new geometry design. With a special geometry that has been designed and optimised with extensive FEM analyses and practical testing, MAPAL now ensures that chips are broken reliably. This prevents automated workflows and production environments from being disrupted. The chip guiding stage is compatible with all indexable inserts with AS leads.

Furthermore, the new chip guiding inserts are available with a wide variety of coatings to support the machining of a vast selection of material types. For more information on how the MAPAL tool design engineers can



create additive cutting tool solutions for all your bespoke manufacturing requirements with inserts that guarantee performance and consistency, please visit the team at MACH.

UK subsidiary MAPAL Ltd was founded in Rugby in 1993 and since then it has ensured fast, direct contact to customers in Great Britain for sales and service. As well as offering engineering and other services from the MAPAL range, the company also has a production unit to be able to offer direct service and short reaction times.

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SCHUNK to demonstrate automation competence with live robotic cell at MACH

SCHUNK will be demonstrating why it is a leader in gripping systems and clamping technology with a live demonstration at MACH. On its stand in Hall 20, SCHUNK will highlight its automation integration credentials with a live demonstration that will coordinate a machining centre with robotic loading, unloading and measuring.

The automated machining cell will see components loaded into a FANUC RoboDRILL machining centre from a racking system via a FANUC robot and subsequently removed from the machining centre and loaded to a Renishaw Equator™. The machine bed of the FANUC RoboDRILL will also be equipped with SCHUNK's VERO-S zero-point clamping technology, which will clamp components for the machining process. The Equator gauging system enables process control by delivering highly repeatable, thermally insensitive, versatile and reprogrammable gauging to the shop floor. Designed for speed, repeatability and ease-of-use for manual or automated applications, the Renishaw Equator system will be working in complete synergy with the FANUC robot and SCHUNK in gripping systems and clamping technology.

The base table of the Renishaw Equator on the SCHUNK stand will be loaded with the SCHUNK NSL mini 100-2 clamping station. The SCHUNK NSL mini is a compact stationary clamping system that has an extremely compact area of 199 mm by 99 mm by 30 mm. This compact clamping configuration provides sufficient space for the robot to load parts into the working area of the Renishaw Equator. This compact design also enables larger workpieces to be loaded into the spacious workspace of the Equator and gives the Equator plentiful space to measure all sides of the loaded workpieces.

Despite the compact design of the SCHUNK NSL mini, it offers a powerful clamping force of 1,000 N and this pull-down force is extended to 3,000 N with the SCHUNK NSL mini Turbo variant. The spring-loaded location system with



cylindrical clamping offers precise short taper centring that is combined with the form-fit and self-retaining locking that is the hallmark of the SCHUNK quick-change pallet system.

The multiple components in the automation cell at MACH 2020 are clamped in pallets that are all fitted with the SCHUNK NSR Robot modules. The NSR system is a maintenance-free robot coupling system for pallet handling that provides easy adaption to robot arms of all kinds. The compact, quick and easy to integrate pallet handling system allows automated machine loading to be located extremely close to the machine table, robot module and loading station. The SCHUNK NSR Robot modules can be operated with a system pressure of 6 bar, which ensures that additional pressure intensifiers are not required. From a positional and repeatability perspective, the NSR has been designed with a very easy joining process that ensures a repeat accuracy of 0.005 mm.

The SCHUNK NSR Robot modules have a patented dual-stroke system that guarantees the highest possible pull-down forces to ensure that robust and rigid clamping minimises vibration. This is enforced by a form-fit self-retained locking system that maintains the full pull-down

forces in the event of a pressure drop. Manufactured from stainless steel and completely sealed, the SCHUNK NSR Robot modules guarantee a long service life with maximum process reliability and stability.

Beyond this cell, that will undoubtedly appeal to manufacturers that are pursuing the benefits of automation, SCHUNK will also be demonstrating its vast range of clamping technology. Visitors to the stand, will be presented with a complete range of lathe chucks, jaws and steady rests, toolholders, quick change pallet systems, pneumatic, hydraulic, vacuum and manual clamping systems, digital technology and much more.

SCHUNK offers the world's largest assortment of gripping systems and clamping technology from one source, and with 2,550 SCHUNK grippers, the largest product range of standard gripper components on the market. The entire gripping system portfolio comprises more than 4,000 components.

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Stands: 20-360, 20-362

Conversational programming of trochoidal milling and jig grinding

HEIDENHAIN has incorporated new software into its TNC control systems, widely fitted by machine tool OEMs to their machining centres and mill-turn centres, that allows complex trochoidal milling routines to be programmed conversationally on the shop floor, without having to download the cycles from a CAD/CAM station. The Optimised Contour Milling (OCM) functionality, which is a new option available for the company's TNC640, TNC 620 and TNC 320 CNC systems, will be demonstrated for the first time in the UK at MACH.

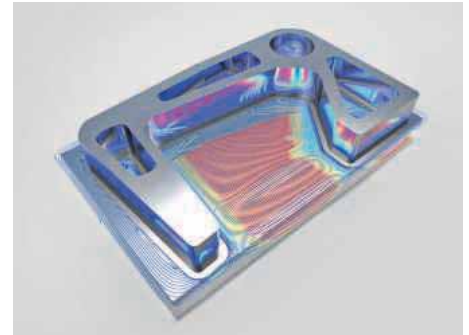
The OCM algorithm takes conventional ideas for trochoidal milling, traditionally used mainly to achieve high material removal rates when slotting and considerably expands the range of application. In addition to the roughing of any open or closed pocket or island, the software also offers cycles for finishing the floors and side walls.

The milling tool's wrap angle can be limited to reduce heat generation and prolong cutter life. As cutting forces are

lower, delicate and thin-wall parts can be machined with greater accuracy and even spindles with low power and torque can be used successfully. Moreover, as the milling cutter occupies less of the area of a slot or pocket during machining, accumulation and re-cutting of chips is minimised. This is particularly important for features that are deep in comparison with their width.

The control automatically calculates the best tool paths for maintaining constant cutting parameters. The subsequent machining operation runs with continuously optimised cutting values, resulting in increased machining speed and a noticeable reduction in tool wear. A sample part produced recently in Germany showed just how effective the new milling strategy is. OCM lowered the machining time and raised tool life by a factor of three compared with conventional milling strategies.

New grinding control capabilities have also been added to the TNC640 to extend complete machining possibilities. The CNC was already able to control milling and turning of components in a single setup on



prismatic machining platforms. However, the latter are increasingly adding grinding capability to extend the scope of one-hit production. At MACH, HEIDENHAIN will show for the first time in the UK that this metalcutting process can also be programmed conversationally and controlled.

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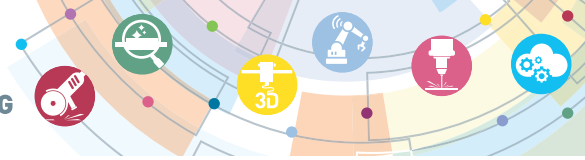


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Guhring offers a thread of success at MACH

When it comes to holmaking and threading, Guhring is undoubtedly an industry leader with a product range that stretches beyond convention. At MACH 2020, the Birmingham manufacturer will reside in Hall 17, on a 100 sq/m stand that will introduce the very latest milling, threading, holmaking and special cutting tools alongside established product lines.

The Guhring portfolio of holmaking products has long been an industry benchmark in terms of the quality and diversity of options for end users. However, MACH will not only be used to promote new drilling lines, but also the impressive range of complementary technologies such as the threading and countersinking lines. Making a debut appearance at the exhibition will be the new MTMH3-Z 'Drifter' series of helical drilling thread mill products. Capable of thread milling in material up to 66HRC, the new Drifter series combines core drilling and threading in a single operation.

The exciting new MTMH3-Z Drifter delivers excellent machining results and process reliability when wet or dry cutting all material types up to 66HRC. With two oil grooves on the shaft to provide optimum cooling and a left cutting geometry that stabilises performance during climb milling, the fine grain high-performance carbide MTMH3-Z gives stability and performance



that are unrivalled. With a shank diameter from 3 to 12 mm and a neck relief from 5 to 40 mm, the new thread milling series is suitable for creating threads from M2 to M16 on a material range that includes all steels and stainless, duplex, cast and graphite iron, aluminium and Ti alloys. To simplify the process for end users, Guhring has also developed its CNC Guhro Thread Mill software that is free to download for Guhring customers.

For manufacturers more inclined to use traditional threading methods, Guhring will be showing the PIONEX Series of taps at MACH. Following on from an extremely successful MACH debut in 2017, the return of the PIONEX is testament to the success the line has generated in the marketplace. The high-performance tapping line incorporates a polygon shape that generates 30 percent less torque that coincides with a geometric change of the taps. The PIONEX thread-formers are based on a newly developed powder-metallurgical cutting tool material that demonstrates a higher wear resistance than previously reached. The new Pionex Series includes 45-degree helix geometry with a reduced rake angle, back tapering and improved relief; all this culminates to provide unprecedented performance and swarf removal. The new Pionex is available with metric threads in course or fine pitch as well as UNC, UNF, BSP in all diameter and pitch variants with a complete line of special thread designations also available upon request.

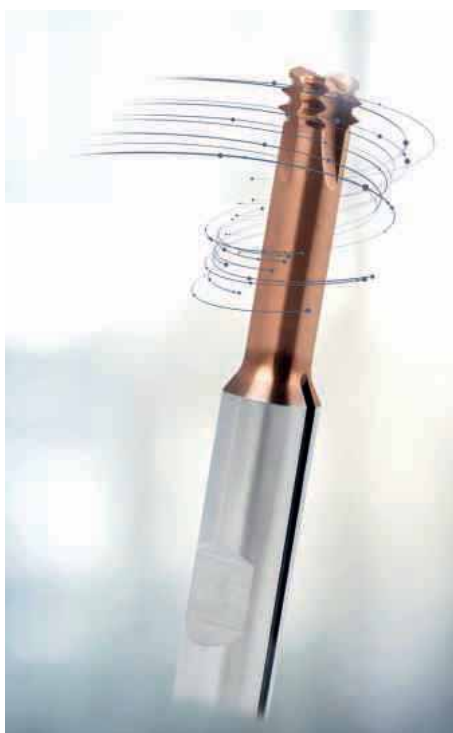
Matching the performance of the Guhring drilling and threading lines, the new SpyroTec Series of Twisted HSS and HSCO countersink tools will also be presented at

the exhibition. As a 'world-first', the SpyroTec countersinking series incorporates a unique spiral fluted geometry with convex cutting edges. The benefit of this exciting new geometry design from Guhring is that the 90-degree countersinks can comfortably cut virtually all material types with improved concentricity, precision and performance.

The axial and radial forces that occur during countersinking operations are both reduced by more than 60 percent due to the newly developed geometry of the SpyroTec cutting edges. The convex radii of the cutting edges combine with the variable helical pitch to provide stable, low-vibration, low-noise and high-performance chatter-free countersinking. The specially designed TiAlN coating ensures higher wear resistance and a high-temperature hardness that guarantees longer tool life for nearly all materials and applications. The standard SpyroTec programme is available with 14 dimensions that range from 6.3 mm to 31 mm diameter with a 90-degree countersink that conforms to DIN 335 form C. The SpyroTec is available with a number of shank lengths to suit the requirements of the end user and for the purposes of convenience, boxsets with a range of diameters are also available. For further details on any of the new threading, countersinking or holmaking products that are available from Guhring, visit its stand at MACH.

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Stand: 17-400



MMMA Metalworking Village at MACH

The Metalforming Machinery Makers' Association (MMMA) Metalworking Village at MACH fills the largest area the Association has ever taken at the event with 25 members exhibiting. The Metalworking Village covers 650 sqm, one of the largest areas of any exhibitor at MACH. The village will demonstrate technologies, services and products across many sectors of UK manufacturing. The Association is very proud to boast over 25 individual companies, seeing the largest number of exhibitors from the MMMA in twenty years.



The Association has gone from strength to strength and over the last two years many changes have been implemented including an upgraded website, increasing focus on social media platforms and an increase in member benefits. Membership levels remain positive and with an upwards trend. There are currently 44 members, covering many manufacturing sectors within UK manufacturing.

With the MMMA hosting its specialist metalworking exhibition, within MACH 2020, it provides a fantastic opportunity for its members to showcase skills, services and technologies to visitors across manufacturing UK. Within the Village, visitors will be welcomed to call on each member stand to discuss and discover what is available and how it could help them in improving production to gain more orders and increase profitability.

Members exhibiting include: Bruderer UK, Esprit Automation, Cotswold Machinery Sales, Worcester presses, Schuler, Presscare, TMA, Roemheld UK, Industrial Clutch, Kaller Gas Springs, Press Techniques, Helm Instruments, Anton Saws, Qualimach, Wilson Tool, Pressform machinery, Ortlinghaus, Decade Monitoring, Group Rhodes, Oerlikon Balsers, Voith Turbo UK, Formit, Raybould Machinery, Ross UK and Aida SRL UK.

There are further members who are attending MACH 2020 and exhibiting within the main halls including Kuka Robotics and A W Precision.

Momentum is increasing as we move closer to MACH 2020 and visitor registrations are at an all-time high with overall exhibitor numbers up. Once at the show, take time out to visit the Metalworking Village.

The MMMA, to this day, is still the only UK Association solely dedicated to the sheet metal forming industry.

The Metalforming Machinery Makers' Association (MMMA) is dedicated to representing the sheet metal forming industry in the UK.

Its main objective is to promote the interests of companies involved in the manufacture and sale of metalforming machinery



and ancillary products, including high speed presses, hydraulic presses, straightside presses, manual die clamping, coil handling lines, servo forming, benders and stackers.

It provides advice, guidance and support on everyday issues in order for its members to thrive in today's global marketplace and continue to supply machinery to customers in the automotive, aerospace, construction, renewables, security and white goods sectors.

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Phibo is a renowned company in the field of digital dentistry and promotes growth and expertise with the aid of innovative solutions that accompany and simplify daily life and improve patients' lives.

In addition to products such as implant systems and CAD/CAM prostheses, Phibo also offers services and digital solutions. Phibo is currently a leader in Spain and plays an important role in the Latin American market and various European countries. The individual prostheses are produced near Barcelona, Spain and in Bogotá, Colombia, using selective laser melting and/or milling. A key component of the process is the REGO-FIX powRgrip.

The company has developed, produced and sold dental products for more than 30 years with a key focus on research and scientific innovation. Over 8,000 customers, more than five million implants produced and 2.5 million CAD/CAM customised prostheses are a testament to the company's success.

Implant system production facility

When it comes to standardised production of implant systems, Phibo uses calibrated titanium rods as a raw material. These rods are then mechanically machined to produce a variety of products such as implants, pins, and clinical instruments. "Phibo currently has a portfolio of more than 2,000



references for standard products," says Josep Pujol, COO of the Phibo Group.

It's worth mentioning here that the process for treating the surface of Phibo's patented implants is an important step in enabling flawless osseointegration.

Production facility for CAD/CAM solutions

While the implant systems are standardised products, the prostheses produced using CAD/CAM are fully customised.

The CAD/CAM processes have become indispensable in modern-day dental technology and, as a pioneer in the industry, Phibo has been using them for more than ten years and produces thousands of prosthesis units daily in a production run of 24 hours. Thanks to this technology, prostheses can be fully customised for an optimal fit and look.

This process begins with the impression, which can be taken digitally, provided the dental technician has an intraoral scanner at its facility, or the traditional way using materials such as silicone, which is then followed by digitisation. In both cases, the prostheses that Phibo produces are designed in the laboratory using CAD software. Phibo produces these prostheses from a variety of materials such as cobalt chrome, titanium, and zircon. In the case of cobalt chrome, the process begins with laser sintering, with the material then mechanically machined in different machine tools equipped with the REGO-FIX powRgrip.

The prostheses are machined at a high speed on over 20 machining centres, with CNC and five axes and with spindle speeds of up to 60,000 rpm. The HSK-32 connectors are used at all machines. "When machining, we need to maintain precision of 10 µm,"



emphasises Eduard León, production manager for CAD/CAM at Phibo. The Phibo CAD/CAM technology can be used with this level of precision thanks in large part to the REGO-FIX powRgrip clampings, which Phibo has been using since the beginning. The reason for the launch was the purchase of a second machine with computer numerical control, as up until that point only ER collets, manual system, had been used. Productivity and precision needed to increase to keep up with company growth. The idea was also to reduce the number of toolholders, simplify clamping and create a durable system. Tests were then carried out, with powRgrip ultimately securing the victory. Why? Because the system not only has the simplest design, but also works faster and more precisely than the rest. This has helped to reduce downtime significantly. What about the durability? To this day, Phibo is still using the same clampings that it purchased more than ten years ago. These work with the unchanged precision and service life of the tools. "If you work carefully and keep everything nice and clean, you'll have a product that maintains precision for many years to come," explains Oscar Velilla, CEO of GerSwiss Ibérica Technology, which represents REGO-FIX as a distributor in Spain.

He continues: "In the case of traditional clampings, which are tightened by hand, the thread is exposed to a certain level of wear and deformation. If you use the powRgrip collet, there's just about no wear with clamping and releasing, which is why the same level of precision can be guaranteed even after thousands of clamping cycles."

Optimal surface quality

Phibo's CAD/CAM technology can be used to manufacture a huge variety of products. While each tooth and every prosthesis is unique, it has been possible to standardise some processes, thus enabling batch production.

"We're familiar with the service lives of tools and we know how much machining can be carried out," emphasises Eduard León. Over the years, the CAD/CAM technology has optimised the machining strategies and manufacturing processes at Phibo. These analyses took the powRgrip clampings fully into account. HSC machining has played a key role in optimising processes and reliability with high system concentricity of 3 µm.

To this day, Phibo's CAD/CAM technology features an extensive range of devices for analysing HSC processes and guaranteeing that the target values are achieved and the processes optimised. powRgrip continues to help coordinate process parameters with a high degree of precision and thus achieves consistently high quality efficiently and with a low range of tolerance. "The surface quality that we achieve by damping vibrations is ideal for us," adds Eduard León. As a collet-based system, holder and collet, powRgrip offers this vibration damping as a significant benefit over thermally and directly clamped toolholder systems, resulting in optimal damping and thus a considerable reduction in vibration behaviour during use.



Benefits that speak for themselves

According to Eduard León, the powRgrip's key features are its reliability and ease-of-use. Tests are not necessary as long as the system is used carefully. Having carried out millions of CAD/CAM processes individually, Phibo can look back on a high degree of reproducibility and system concentricity.

Eduard León concludes: "A long service life with high quality and precision. Those are the strengths of the powRgrip."

Rego-Fix is an internationally active, family company in its second generation. Today the company, based in Tenniken, Switzerland, is one of the leading manufacturers of tool clamping systems and enjoys a worldwide reputation in the metalworking industry. As a result of its global sales partner network, with locations in Switzerland, the USA and Asia, Rego-Fix is optimally positioned and present all over the world. With pioneering product inventions, Rego-Fix has developed from a small company to a global solution provider for tool clamping systems. Each product is developed with the aspect of increasing productivity and produced with Swiss quality. Rego-Fix products can be found particularly in the areas of vehicle and aircraft construction, mould construction, mechanical engineering, medical technology and watch manufacturing.

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Amputee bonds with son thanks to 3D printed bionic hand

For 21 years, Danny Florence has lived with one hand, but when he became a father, he decided to apply for an Open Bionics Hero Arm. With the help of the maxon driven prosthesis he can now build a strong bond with his son.

At the age of five, Danny Florence lost both legs, a hand and most of his fingers. He recalls: "I remember always being outside on my bike or my rollerblades and one day my ankle started hurting. I went to bed and during the night began to hallucinate and my body started spasming," he had contracted meningitis.

Danny Florence was put into an induced coma and doesn't remember anything until he woke some eight weeks later. During that time, doctors had to amputate his limbs to save his life. He had to learn how to talk and drink again and get used to the pain. When he became aware he had lost his legs his first thought was that he wouldn't be able to ride his bike anymore.

He explains: "Mum took me to the hospital every day for two years to have physiotherapy as part of my rehabilitation. The doctors gave me basic leg prosthetics after three months and, after a while, I learnt to walk with them. These days I use a powered wheelchair as I can't walk far. I didn't do anything about my lack of a hand until I reached eleven or twelve and became self-conscious about it."

Unfortunately, the hospital could only offer two options; a body-powered prosthetic with a gripper or a 'mannequin-like' hand with no functionality. After a couple of days wearing the heavy passive prosthesis, Danny Florence decided to stop using it: "It looked worse than not having a hand," he states.

"I've always managed well with only one hand but when my son Joshua came along ten months ago, I realised how much more I could do with two." Both he and his partner Danielle had anticipated having issues with dexterous tasks like nappy changing and getting the baby dressed, but Danny Florence hadn't realised how much not doing these things would affect the bond with his son.

He had heard of a company called Open Bionics. The Bristol-based company is a multi-award-winning designer and manufacturer of affordable prosthetic limbs and is responsible for producing the world's first medically certified 3D-printed bionic arm.

Open Bionics has worked with maxon since its inception in 2015. maxon designed and produced the actuator for the digits in the Hero Arm, each finger uses a maxon DCX 12 L motor. The actuator consists of a DC motor driving a customised gearbox and lead screw and nut, developed for the speed of each user.

As muscles generate electrical signals when they contract, they create movement when connected to the electrodes in the prosthetic. Adult hands use four DC motors and, as they are so much smaller, a child's hand uses only three. As space is limited, Open Bionics chose maxon's DCX 12 mm as it is the most compact



DC motor with the highest power density on the market. The company were also able to get samples quickly delivered by using the maxon online Configurator.

Although Open Bionics offer Hero Arms in various designs, including ones from Disney, Danny Florence opted to go for the sleek black cover to match his legs: "When I was younger, I was given skin-coloured tights and padding to make my legs look 'real' but they snagged a lot and it wasn't practical. I used to park in the disabled bays and get abuse from people not realising I didn't have any legs, now I wear shorts all the time and don't get any abuse.

"These days prosthetic designs look much better and all my nieces and nephews think I'm bionic." He admits being terrified at how his son is going to react to his new hand: "He loves my prosthetic legs, he gets all excited and laughs when I put them on and likes to touch them."

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VxWorks Cert Edition IEC 62304 for medical device development

Wind River has announced IEC 62304 medical standard compliance for the latest release of its VxWorks® Cert Edition. The real-time operating system for safety-critical applications is designed and developed to the highest achievable safety levels accepted by worldwide certification authorities and now includes a full suite of safety certification evidence across sectors, including automotive, avionics, industrial, and medical.

With this latest certification evidence assessed by auditing body TÜV SÜD, the Wind River RTOS for medical is compliant for use in applications requiring up to IEC 62304, Class C compliance. It is the standard for medical device software, software life cycle processes. The commercial off-the-shelf software, along with associated evidence package, is designed for safety-critical medical devices, helping manufacturers reduce or even eliminate the validation efforts around SOUP (Software of Unknown Provenance).

“From surgical robots to smart hospitals, new technology is revolutionising healthcare, bringing new safety and security

concerns that must be addressed with stringent industry regulations and standards,” says Amar Parmar, senior director of medical at Wind River.

“Developing secure, safety-compliant medical devices requires a balanced blend of regulatory awareness, proven components and efficiency of design practices. Wind River has addressed each of these concerns with the latest release of VxWorks Cert Edition.”

This latest medical certification evidence builds on Wind River’s 20-plus years of experience in safety certification software products and demonstrates the company’s commitment to helping medical technology developers accelerate time-to-market and reduce costs with next generation software solutions.

With its comprehensive software portfolio, Wind River supports a diverse range of medical device manufacturer journeys from design to development to deployment, whether teams require open source and need Linux, or an RTOS, or both. This flexibility allows companies to deliver innovative products that leverage the latest



community driven innovations, while meeting the safety, security and reliability requirements for mission-critical applications. Wind River is a leader in delivering software for the intelligent edge. The company’s technology has been powering the safest, most secure devices in the world since 1981 and is found in more than two billion products. The company offers a comprehensive portfolio supported by world-class global professional services and support and a broad partner ecosystem.

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Hammer-IMS thickness measurement system

Innovative technologies are at the heart of Orfit Industries in Wijnegem in the Antwerp region of Belgium. The company develops and produces the most precise and reliable thermoplastic materials for medical devices that improve patient treatments around the world. Recently, Orfit installed a Hammer-IMS thickness measuring solution for its high-temperature thermoplastic extrusion line.

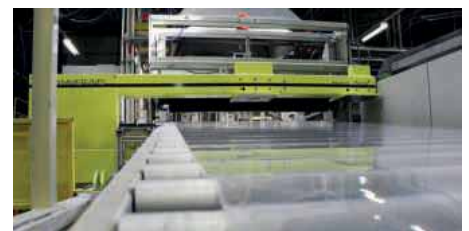
Bram Moons-Baitel, plant manager at Orfit Industries, says: “By keeping a closer eye on extrusion thickness, Orfit minimises material waste and maximises the quality of its orthotic and prosthetic product lines. Our orthotic fabrication materials are used for patients in physical rehabilitation and prosthetic socket materials for amputee patients.”

The thermoplastic extrusion process is very sensitive. Changing environmental conditions influence the thickness of the extruded sheets. Previously, Orfit tried a fixed laser-based measuring system. Unfortunately, the use of the laser sensor faced problems when measuring certain

material colors and transparency levels. Also, the sensor was unable to adequately withstand the heat in the early extrusion process stages. Orfit was committed to extensive manual thickness measurements to keep the extruded material variants within specifications.

Bram Moons-Baitel explains that he was glad to hear about the emerging M-Ray measuring technology of Hammer-IMS: “After installing our new Hammer-IMS system in our thermoplastic extrusion process, things really changed. First of all, the measuring system can be positioned right after the chilling rolls to measure the hot, freshly extruded sheets. The Hammer-IMS system verifies material thickness variations caused by variations in the extrusion bank which may slightly shift under varying pressures.

“Thanks to two scanning M-Ray sensors operating with high standoff distance, there is sufficient transversal material coverage without risking overheated sensors. By measuring 9 metres more upstream in the process, we can promptly adjust extrusion



parameters locally to maintain correct thickness and avoid significant amounts of material waste.”

Bram Iliens, Hammer-IMS product and development engineer, adds: “The contactless M-Ray technology, based on electromagnetic millimetre waves, supports fast and accurate measurements. The M-Ray wave travels from the transmitter to the thermoplastic material, penetrates it and continues its path to the receiver. The time delay of the M-Ray wave, caused by the material, results in the thickness measurement of the material.”

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EDGECAM powers Tridan's 5-axis machining

With customers in the aerospace, motorsport and medical sectors demanding faster turnaround times and tighter tolerances, subcontractor Tridan Engineering says 5-axis work, programmed by EDGECAM, has become a major part of its manufacturing process.

EDGECAM programs a total of 16 Mazak CNC machines, of which six are 5-axis, including a Variaxis i-500 with a Pallettech automation system.

One of the biggest challenges facing the production process is keeping up with ever-changing tooling for its range of components across several industrial sectors. For example, the company manufacture aerospace parts including frame racks, wing actuators and wing braces for the Bombardier Airbus as well as motorsport components such as gearbox transmission systems and differential cases for rally cars, along with a number of medical components. Paul Coupland, machine shop manager, says: "We work with two main tooling suppliers, ITC and Iscar and they're improving their tools all the time. EDGECAM provides us with the optimum machining strategies every time the cutting tool is updated, including those for powerful 5-axis programs.

"EDGECAM programs all our machines to their absolute top tolerances. We regularly have a 2-micron tolerance on most of our jobs and we can guarantee that they're manufactured to that required high precision every time."

The combination of 5-axis machining with the CAM software's powerful and game-changing Waveform Roughing



Strategy has been a major influence on how they now machine components. Everything is now done with the Waveform trochoidal milling and tooling strategies have changed to take a full flute length cut.

Lead production engineer Mark Proctor says they've had some spectacular results with it, but admitted they were nervous at first about the prospect of ramping up feeds and speeds and using the full flute length: "When we were told we could machine a piece of S143 stainless steel at eight metre a minute, we thought the cutting tool wouldn't last two seconds."

However, he says once they saw the resulting faster cycle times and, that the tool was safe from damage, they made the decision to do all their Waveform roughing at the machine's fastest feed rate: "For instance, we needed a finished component that's only 20 mm thick, coming from a six-inch S143 round billet, which means there's an awful lot of metal to cut away. For that job we used a 12 mm cutter for a 24 mm depth of cut and the job ran for ten hours before the cutting tool needed replacing."

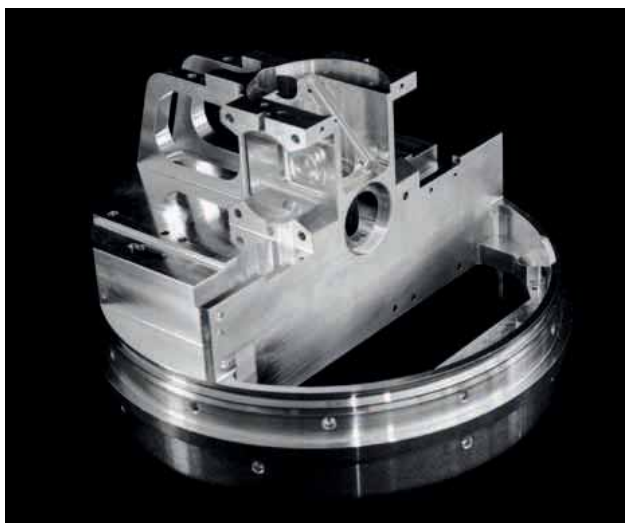
Overall, the company which is based in the Essex seaside town of Clacton-on-Sea, ships around 9,000 parts a month to customers around the world; anything from small components to workpieces up to 1.6 m, both as single units and in large batches. Almost every part they produce goes through EDGECAM.

Mark Proctor says EDGECAM is even better since it included a button to unhide the stock underneath: "In earlier releases it wouldn't see the stock underneath, but it's now an even better cycle with this option."

Describing 5-axis machining and automation as the way forward for Tridan Engineering, Paul Coupland says the recent acquisition of the Mazak Variaxis with a Pallettech automation system adopts both of those aspects: "5-axis is definitely the future for us, as it enables us to machine much faster than 3-axis can, through the 'Done In One' capability, without the need for additional setups. The automation system on the Variaxis can manage six pallets, which is perfect for our needs. We can add six pallets at any stage of the operation to keep it going. It also means we can carry out lights out machining. Depending on the job, it can run constantly for between eight and 14 hours without any manual intervention."

Currently operating from premises of 26,000 sq ft with 66 employees, growing order books mean the company, which was founded in 1968 and is now owned by the Langham Group, is now looking to take what he describes as their next natural step. Paul Coupland concludes: "We've recently bought a third of an acre next door and are planning to double the size of our machine shop."

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Economical solution to producing prismatic and rotational components

It has been estimated that there are an enormous, one followed by 60 zeros, drug combinations covering chemicals, genomes, proteins, peptides and natural compounds that could be screened in an effort to find optimal and even personalised treatments for diseases. It is a fantastically large number and failure rate is high.

That is why pharmaceutical companies both large and small are interested in cost-effective, High-Throughput Screening (HTS), particularly as preclinical development accounts for 40 percent of the typical US\$2.5 billion cost of bringing a new drug to market.



Hooke Bio is leveraging the expertise of its multifunctional team to produce the first prototypes of a so-called Enigma HTS platform, which aims to use 3D cell cultures to generate more reliable data than current drug screening technologies at higher throughput than existing systems on the market.

One step that the firm has taken in the machine shop producing the stainless steel and aluminium components for prototype Enigma systems has been to purchase a German-built Hermle C 250 5-axis, vertical-spindle machining centre (VMC) through sole UK, Ireland and Middle East agent Kingsbury.

Hooke Bio's R&D engineer Shane Devitt explains: "We wanted a 5-axis machine to produce components in one hit rather than two, as we need to hold tolerances down to ± 5 microns and that is difficult if a part has to be reclamped.

"Even with a drilled hole, where the accuracy of the diameter is defined by the cutter rather than the machine, it can have a slight offset if it has to be drilled from either side to meet in the middle and that causes a dramatic alteration to fluid flow.

"Unlike when early prototypes were being made at the University of Limerick on a 3-axis VMC of another make, work is now automatically repositioned in-cycle using the rotary axes of the Hermle. It allows us to hold the accuracies we need and there is no tolerance build-up."

Hooke Bio's choice of a trunnion-type 5-axis VMC rather than one with a B-axis spindle or knuckle-type table swivel was down to the ability of the trunnion design to hold tighter tolerances. The C 250 was selected following a visit to Kingsbury in Gosport and a trip to Hermle's production plant in Gosheim, Southern Germany, where the medical company's engineers were impressed by machine demonstrations and the build process.

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Diecaster starts to automate its machine shop

Andover-based MRT Castings, which has long used robotic systems in its aluminium diecasting foundry, has started to introduce automation in the machine shop following the arrival of a Japanese-built Brother Speedio M140X2 5-axis mill-turn cell. It is fed automatically with raw material from an interlinked Feedio robotic handling system from the same manufacturer, the first to be installed in the UK. The turnkey cell was supplied in April 2019 by sole sales and service agent Whitehouse Machine Tools.

One-hit machining is the watchword at the diecasting firm to keep production costs down and remain competitive on world markets, as well as to avoid tolerance build-up and hence maximise component accuracy. A user of Brother 30-taper, 4-axis machining centres since the early 1990s, the company now operates twenty, half of which are equipped with a pallet changer. In addition, there are three twin-spindle CNC lathes with driven tooling on the shop floor.

MRT's managing director Phil Rawson says: "Our unwavering pursuit of single setup production means that we sometimes find ourselves processing parts on our lathes that entail only one-third turning, with the remainder of the cycle taken up by prismatic machining using live tools in the turret.

"It is an inefficient method of milling and drilling, as the rotational speed and power of the limited number of tools in a lathe are considerably lower than those of the spindle on a machining centre, which also has the benefit of access to more tools.



"So, we decided to invest in a mill-turn machine and identified the Brother M140X2 as ideal for our needs. It has a powerful, 16,000 rpm, face-and-taper contact spindle and a 22-tool magazine plus a turning table with a 55 Nm direct-drive motor powering a 2,000-rpm turning table.

"When not performing a turning function, the C-axis table together with the A-axis trunnion can be employed to position a component in the two rotary axes for 3+2 prismatic machining, which is needed for most of our components."

To leverage the high productivity potential of the M140X2, the plan is for any rotational part that requires a majority of milling and drilling in its cutting cycle, whether machined from a casting, billet or bar, to be put onto the 5-axis machine. The Feedio system equipped with a 6-axis ABB robot is capable of handling billets up to 80 mm diameter or aluminium castings up to 120 mm diameter and delivering them to a hydraulic chuck on the machine table.

A vision system and built-in PC allows the robot to detect where on the upper inlet conveyor of the Feedio the raw material has been placed, so the billets or castings do not have to be aligned on a grid or in a tray. After machining, components are returned to an output conveyor that, to minimise the footprint, is positioned below the first rather than to the side.

Phil Rawson continues: "Until recently,

we operated a day shift with a few hours' overtime in the early morning and evening. The new Brother cell has added to this by allowing us to run lights-out for up to eight hours, depending on component size and cycle times, as well as unattended during the day."

The first contract to be fulfilled in the automated cell is a family of aluminium bodies for a range of LED light fittings. Prototypes were produced on twin-spindle lathes with live tooling, but as only around 30 percent of the machining is rotational, it is better suited to production on the M140X2 mill-turn. Cycle time has been almost halved from 15 to eight minutes, thanks to the higher power of the 16,000 rpm milling spindle and its rapid acc/dec, tool change in less than one second, up to 30 m/min cutting feed rate and 50 m/min rapids.

The production team at MRT had been looking for some time at different possibilities for automating its Brother machining centres to increase the efficiency of producing parts in batches of typically 500 to 1,000-off. According to Phil Rawson, such medium size volumes do not lend themselves readily to automated solutions, which normally require expensive, dedicated, hydraulic clamping fixtures in the machine tool. However, he pointed out that the M140X2 already has a hydraulic chuck and therefore the workholding function is

already in place, so no extra fixtures are needed. It is therefore the ideal machine to trial automation in this type of production environment.

To assist in finding the best robotic handling configuration to go with the machine, MRT enlisted the help of the Manufacturing Technology Centre in Coventry. After researching the market, towards the end of 2017 its advisers concluded that a conveyor system and a teach-in programmed, vision-enabled, 6-axis robot with interchangeable 3D-printed grippers would best suit the types of components produced and machines in use at Andover. Coincidentally, that was just when Brother launched the Feedio system at EMO 2017 in Hannover.

Phil Rawnsdon adds: "It was a perfect fit for our needs, which was to acquire a standard, compact, entry-level cell that does not need complex robot programming or workpiece trays, delivered and commissioned by a single-source supplier, in this case Whitehouse Machine Tools.

"Feedio is suitable for retrofitting to all our Brother machining centres, both non-APC and twin-pallet types, allowing us to reduce operator attendance and

maximise production hours during the day. Quality is enhanced, as workpiece loading is more consistent.

"In addition, we are able to extend our single day shift by taking advantage of lights-out running into the evening or even overnight, raising output without increasing our headcount. Importantly, all our operators are supportive of introducing new technology like this."

He went on to cite other advantages of the automation system. At present, the LED lighting components are still produced by first completing Op 10 and then reloading them for Op 20. However, they could be produced in one hit if a turnover station were to be introduced. Alternatively, one Feedio could serve two machining centres carrying out both operations simultaneously. There are also possibilities to integrate other functions such as component deburring and washing.

Phil Rawnsdon concludes: "We see automation as the future for our company. Aluminium billets have been machined so far but the suitability of automatically handling castings is being investigated.

"We plan to target a wide range of different components for production in the



new mill-turn cell and will be looking in particular at parts where turning content is less than half of the cycle time."

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OPEN POSSIBILITIES

Additive manufacturing and 5-axis machining of larger workpieces

A new 5-axis machining centre with integrated laser deposition welding capability for accurate, reliable, cost-effective, complete production of complex components in one hit has been introduced by DMG MORI. The LASERTEC 125 3D hybrid is intended for the manufacture, maintenance and repair of workpieces up to 1,250 mm in diameter by 745 mm high and weighing up to 2,000 kg.

The company launched this technology in 2013 with a smaller model, the LASERTEC 65 3D hybrid, since which time the global manufacturing group has become a leader in supplying machines for additive production of metal parts. Gradually the machine range has been extended, first with the LASERTEC 4300 3D hybrid combining additive manufacturing using a powder nozzle and turn-mill machining in one work area and then with powder bed machines in the LASERTEC SLM series.

Based on the machine tool builder's rigid monoBLOCK platform, the LASERTEC 125 3D hybrid offers high dynamics, rapid build rates and excellent repeatability. Automatic changeover between laser deposition welding and simultaneous 5-axis milling in a single setup reduces processing times by up to 80 percent. Such savings are helped by eliminating the need for heat treatment as a separate process step due to the machine's ability to deposit material with a hardness of up to 63 HRC.

The alternate use of laser deposition welding and simultaneous 5-axis milling is beneficial for improving production processes or enabling new component geometries, an example being the manufacture of closed impellers. Another strength of the hybrid machines is the

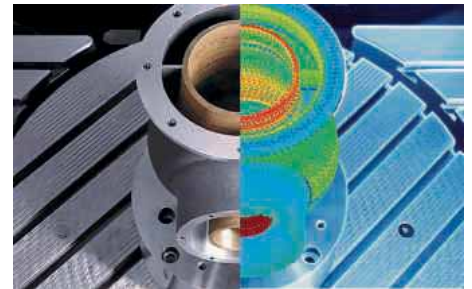


production and repair of hot and cold forming and forging dies.

The LASERTEC 125 3D hybrid can also produce lightweight structures that reduce the weight of parts by up to 90 percent. A selling point of laser deposition welding is the possibility it offers to change between two materials quickly under CNC. So, for instance, hard surfacing to reduce wear can be carried out in one area and corrosion-resistant welding for environmental protection may be carried out in another. Alternatively, the cooling characteristics of a part can be significantly increased. As an illustration, a die casting mould can be produced by starting with a bronze core that dissipates heat effectively and welding onto it an outer skin of tool steel.

In the past five years, such machines have emerged as a key procedure for economical repair and recoating. The damaged area is first prepared by milling before the repair is carried out by laser deposition welding. The part is then finished in a final milling process, all in a single setup. The individual processes are thus combined in one machine, without compromising other production resources. Due to precise process control, the weld material deposited is of very high quality. The service life of repaired inserts for a die casting mould, for example, is three times longer than if it had been repaired by manual welding.

Another use of the procedure is in areas where top priority must be given to plant availability and reduced maintenance times. These include industries such as oil and gas as well as the chemical, pharmaceutical and energy sectors.



As with its sister models, the LASERTEC 125 3D hybrid can be integrated into a CAD/CAM process chain that contributes significantly to raising productivity. High-performance hybrid CAM software for powder nozzle technology, developed especially for DMG Mori by Siemens NX, enables end-to-end programming of repairs with users able to change seamlessly between machining and laser deposition welding during programming. The process steps are sent to the machine in one program and executed alternately in automatic operation.

AM Assistant is part of the innovative software and hardware offer. It includes an integrated thermal imaging camera for continuous monitoring, either of the entire component or defined areas, monitoring of the melt pool size and temperature, or monitoring of the clearance between nozzle and component.

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5-axis machining centres from Heller

The HELLER F-series 5-axis machining centre is the right choice for anyone wanting to perform numerous functions on one machine and produce reliably, not just today but in the future too. Solid machine construction, sound process experience and a wealth of milling expertise have come together to produce the machining centres. The machines offer 5-axis machining with maximum output and top quality, even during continuous operation.

Machine concept

Only the perfect combination of strength and light weight creates a machine design that guarantees the best surface quality and a long tool service life. As with all Heller machines, the main components of its F-series 5-axis machining centres were also



computed by means of the FEM method. The result is a machine bed optimised for stiffness and a weight-reduced column. It is highly dynamic with perfect precision.

Spindle units

Optimised process stability in 5-axis machining is also a question of the right spindle. The F-series 5-axis machining centres offer a choice of swivel heads and tilting heads. No matter whether heavy-duty machining of cast iron or steel or high-volume machining of light alloys, the F-series offers the ideal solution for customer requirements.

Tool management

In 5-axis machining, work is undertaken daily with a broad range of tools and large tool geometries. With the F-series 5-axis machining centres, users can continue to be flexible and rely on short tool setting times, short downtimes and short idle times.

Workpiece management

It is of course possible to configure the machining centre to suit particular

requirements. As a workshop machine with large work area, ideally suited for single part production, or as a production machine with pallet changer and the corresponding automation solution for series production, the machine can be tailored to meet an individual's needs.

Automation

Automation solutions from Heller are individual concepts that are developed specifically for production facilities. Customers' requirements are analysed and a solution is provided that allows them to work to maximum capacity. Standardised solutions are used wherever possible. The F-series 5-axis machining centres are prepared for pallet and workpiece automation.

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Accuracy is everything

Precision engineering for aerospace and automotive sectors demands a proactive approach to complex part verification. Italian subcontract manufacturer, R. Busi, made a strategic decision to move to 5-axis Coordinate Measuring Machines (CMMs). Renishaw 5-axis measurement heads have enabled the company to meet the verification needs of increasingly complex part designs and deliver the tolerances and repeatability it demands.

R. Busi operates from a 22,000 sqm facility in Mezzanino, Italy, where its factory houses 40 production machines including lathes, 5-axis vertical milling machines and 4-axis horizontal machining centres. It employs 40 production personnel working in two shifts.

As a part of its continual improvement philosophy, the company made the decision to move to 5-axis CMM part verification.

Any evolution in the part verification process had to be capable of supporting the high production throughput levels achieved at the R. Busi factory. A migration to 5-axis CMMs needed to avoid introducing any obstacles or bottlenecks in operations.

At the same time, the 5-axis measurement technology adopted by the company had to provide the flexibility required to verify a highly diverse range of parts produced for a wide range of different industrial sectors.

Accuracy, of course, was an absolutely vital criteria in selecting a 5-axis metrology solution. It would need to meet the most exacting standards of the aerospace sector where 100 percent part verification is a prerequisite consideration.

The unique 'head touches' of the PH20 5-axis touch trigger system enables R. Busi to take measurements by moving just the head, rather than the CMM structure. Measurements can be taken faster as a result, with improved accuracy and repeatability. Its 5-axis motion also reduces time spent indexing the head. This combination of factors typically results in a 3-fold improvement in throughput over conventional systems.

For certain part measurements R. Busi also made use of Renishaw's REVO 5-axis measurement system. The introduction of 5-axis measurement technology has had a



wide-ranging impact on R. Busi's precision manufacturing operations as Paolo Orlandi, head of quality at R. Busi, explains: "In short, having three 5-axis CMMs operating in a dedicated measurement room means we not only get extremely precise measurements, we get them very rapidly as well. By dramatically increasing measurement speed and significantly reducing production machinery downtime, the business has gained a serious productivity advantage."

Renishaw plc

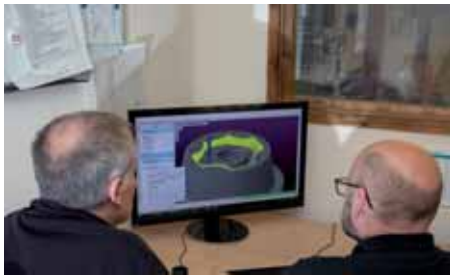
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Rail demand drives investment at Ferrabyrne

Ferrabyrne is a specialist moulding company predominantly producing bonded rubber to metal technology and suspension systems for the rail industry and commercial vehicles. The Littlehampton-based business manufactures as much as possible in-house, including the design and production of mould tools. Recent growth in demand from its rail customers, driven by refurbishment of existing rolling stock to extend its service life and new projects, meant that the company's toolroom had to meet unprecedented production challenges. There was a need for improved and increased machining capacity.



"The rail market is very active at present and this has led to unprecedented demand for our products. Customers such as Hitachi, Siemens, Bombardier, CAF & Stadler are very active in the UK and Europe at the moment," says Mike Wood, Ferrabyrne's project director. "Development of new rolling stock has led to an increased number of new vehicles that our customers are bringing to market and it is a privilege to working with them. We have invested heavily in rapid prototyping to ease pressure at the design stage, but our toolroom was

faced with major production challenges. We would typically produce one mould tool every two to three weeks, at present we have a waiting list of over 40 mould tools with a similar number of assembly tools. Therefore, additional toolroom machining capacity was a priority for us, hence the need for investment."

As products have developed in size and complexity, the demands on the mould tools has also increased and the need for a machine capable of meeting these challenges has led Ferrabyrne to XYZ Machine Tools and its XYZ 2010 vertical machining centre.

Part of XYZ's heavy-duty range, the 2010 VMC is a box slideway-based machine built on solid Meehanite castings, with the machine weighing in at 20,000 kg. One feature that attracted Ferrabyrne to this machine is its 1,000 mm of y-axis travel, which is supported on six hardened box ways. "As our work was increasing in size, we were finding that we were having to shuffle work around on our existing machines in order to fully machine them. So, having the large Y-axis was an important part in our decision making and while we did our research the XYZ was the only machine of this type that could give us that," says Phil Nell, Ferrabyrne's tooling design engineer.

"Our requirements also included a need to be able to quickly set up jobs for one-off and low-volume production and the XYZ gives us that ability, in combination with our WorkNC and Autodesk software which help us to create complex toolpaths quickly for download to the Siemens control."



Prior to placing the order for the XYZ 2010 HD VMC, the team from Ferrabyrne visited an XYZ showroom for a demonstration and whilst there, attention was drawn to the ProtoTRAK lathe, in particular the new ProTURN RLX 425 with a 1.25 m bed length. This machine features the brand-new RX ProtoTRAK control.

"I used ProtoTRAK when it was first introduced and we have an XYZ SLV turret mill in the toolroom with one of the older EMX controls on it, so I was interested to see the new control and I have to say its brilliant," says Phil Nell. The impact that the new control had on him and his colleagues saw them go away to produce a justification for the purchase of the RLX 425 which included the elimination of an existing CNC lathe.

Phil Nell concludes: "The benefits of the RLX 425 have fully justified our commitment to purchase it. We did have some resistance from people who were used to the old machine, but the simplicity and ease of use of the ProtoTRAK control quickly won them over. Our efficiency producing low-volume parts has improved, as we can load DXF files for more complex jobs to the control, but still program many jobs at the machine and quickly be in production. The thing that won most over was the TRAKing facility whereby we can verify programs before pressing cycle start, this gives a lot of confidence to the operators and it is a perfect machine for our toolroom work."

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Cost-effective access to multi-tasking machining savings

Starrag UK has announced a machine rental scheme for its Bumotec range of multi-axis mill-turn and machining centres. It will provide potential users with a cost-effective way to capitalise on the benefits of multi-tasking, single setup machining using world-leading machining technologies for the production of complex small to medium-sized parts.

The scheme allows customers to avoid relatively high upfront capital expenditure yet immediately benefit from the machines' ability to drastically reduce lead times by completing a range of different tasks in a single setting.

As with all machines offered by Starrag UK, the Bumotecs can be configured exactly to suit users' needs in line with Starrag's engineering precisely what you value strategy for dedicated throughput or for smaller batch work and at an affordable monthly rental payment, with an option to purchase at any time.

The scheme applies to the s191 and s181 Bumotec machines which are ideal for users in the medical, watchmaking and jewellery

sectors. In one example, the 5-axis s181 turn-mill machining centre machined a surgical hook complete from 25 mm titanium bar in under 14 minutes, compared with 20 minutes by conventional single-station machining.

Machining on the s181 is based around an innovative two-workstations concept; equipped with five driven tools, the second workstation works on the rear side of one part whilst the main spindle completes another part. With two tools simultaneously cutting, the result is significant reductions in cycle times. The machine's tool breakage detection system, which also operates in 'hidden' time, encourages optimised uptimes too.

With a footprint of just 3.5 m², the s181 has a 30,000 revs/min HSK-40 tool spindle, optionally 40,000 revs/min, can handle bar of 32 mm diameter and has a 90-tool magazine. In addition, a 20-pallet storage system enables uninterrupted 24/7 production.

Starrag Group is a global technology leader in manufacturing high-precision



machine tools for milling, turning, boring and grinding workpieces of metallic, composite and ceramic materials. Principle customers are internationally active companies in the aerospace, energy, transportation and industrial sectors.

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Specialist plastics machinist doubles turnover in four years

Nothing but rotational plastic components are machined in batches from 30 to 20,000 at the Hertfordshire factory of subcontractor Plastic Turned Parts (PTP), which in four years to the end of 2019 doubled turnover and invested more than £750,000 in six new CNC turning centres. Five of them were delivered by Citizen Machinery, four Cincom sliding-head lathes and most recently a Miyano fixed-head model, bringing the total number of lathes on-site from this supplier to nine.

There are also three further turn-mill centres of different makes in use for machining bar and billets up to 65 mm and 150 mm in diameter respectively. A Haas CNC mill has been utilised since 2005 for occasional second-operation work where expedient and also for destructive testing.

All except two of the Citizen lathes are fitted with the company's default option bar magazines from Italian manufacturer Lemca, represented in the UK and Ireland by sales and service agent 1st Machine Tool Accessories. A fixed-head Miyano on site for chuck work has no barfeed and there is one 16 mm capacity Cincom slider with another make of bar magazine that PTP's managing director and owner Jonathan Newis wishes he had not acquired, as it is temperamental.

He says: "To enable us to achieve sustained business growth, we only use the best production equipment on the market. That applies to everything in use on the shop floor including the barfeeds, which is why there are seven Lemcas in use here.

"We particularly like their Elite model fitted to our smallest capacity, 12 mm sliding-head lathe, which has a big bore kit to allow it to take 16 mm diameter bar. The magazine can be swapped over in a matter of seconds from gravity bar feed to



walking-beam operation for reliably advancing smaller stock below 6 mm diameter."

He also singled out for praise an Lemca Boss 338-HD Superfast feeding a 20 mm capacity slider. Turning flexible plastic bar is an esoteric art, one of the problems being that, unlike metal bars, thinner stock sags under its own weight both within the magazine and in the space between it and the lathe. Through 1st MTA, the Italian manufacturer modified the barfeed to include solid panels rather than standard cross struts for supporting the plastic bars along the length of the magazine. Produced also were bespoke clamping blocks to ensure that small diameter bar remains horizontal in the gap between where it leaves the barfeed and enters the turning centre.

Furthermore, in the Siemens touch-screen control fitted to the Lemca Boss there are three standard programs that can be called up according to the mode of lathe operation, whether it is standard Swiss-type turn-milling, guide bush-less machining, or turning of thinner bar with the clamping blocks in use.

Jonathan Newis adds: "We bought our first new Citizen slider in 2007, a 16 mm capacity machine, to replace the cam machines. In all that time the barfeeds have

proved to be reliable and well built, which translates into absence of vibration and hence high dimensional accuracy of machined components as well as good surface finish."

The original lathe from 2007, which is still in use today, is fitted with a Genius 118-37. Like all Lemca barfeeds, it has a double bar pusher to reduce the overall length of the magazine, saving factory space which is in short supply on the subcontractor's shop floor. Another barfeed in use is the Smart 320 on a second 16 mm slider, featuring snap-in guide channels for rapid bar changeover and a self-centring bush at the front to guide the bar.

There is also a KID short magazine feeding one-metre bar into a 51 mm capacity Miyano fixed-head lathe. Not only does it consume less space than the three-metre bar magazines on site, but it also has the benefit that the absence of a gripper means that the remnant is small. It is easily pushed out of the front and ejected, avoiding the job of extracting it from the back of a full-length magazine and so maximising spindle uptime.

Jonathan Newis's focus on buying the best production equipment extends to the turning machines, hence the majority of them are from Citizen. The latest four to be installed feature the Japanese



manufacturer's LFV two-axis oscillating chipbreaking software that is especially helpful when turning plastics, many of which tend to produce bird nests of long, stringy swarf. The main culprits are polyethylenes and thermoplastics, while fluoropolymers also have a tendency to string.

Jonathan Newis explains: "With either of the two LFV software modes switched on when turning these materials, swarf is broken into short lengths that do not wrap around the component or spindle. We can even program the ideal length of swarf through P1 and P2 codes that set the frequency of oscillation so that, at the other end of the scale, unnecessarily small plastic chips do not build up and clog the machine.

"It results in higher productivity and lower



labour costs, as we no longer have to include regular breaks in programs, typically hourly, to stop the lathes for swarf to be cleared from the working area. Lights-out running also becomes possible, leading to higher profitability and allowing us to quote more competitive prices and win extra business.

"Associated difficulties like stringy swarf rubbing against the component and generating heat that can melt the plastic is similarly avoided, as is scrap resulting from broken drills and misalignment when picking up a part in the sub-spindle during part-off."

Regarding tooling, he shared insights into pragmatic machining of plastic materials. Inserted carbide tools are mainly employed and the sharpest varieties designed for machining aluminium are preferred. Single-point turning tools can leave burrs and sometimes result in poor surface finish, especially when machining grooves, chamfers, radii and thread ends, so form tools are frequently used for turning such features.

The combination of lemca bar magazines feeding Citizen lathes, coupled with the subcontractor's specialism and long



experience turn-milling only plastics to within ± 50 microns and sometimes tighter, continues to underpin the firm's success. This is despite the materials' difficult-to-predict behaviour on normalisation after machining, which can cause expansion or contraction. In addition to working for OEMs, PTP regularly receives jobs from metalworking subcontractors that do not have the experience or patience to machine plastics, especially to tight tolerance.

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TDT machine tools partners with CMZ

TDT Machine Tools has struck a new partnership deal with CMZ, the Spanish manufacturer of high-quality lathes and turning centres. With immediate effect, TDT Machine Tools is able to offer CMZ machines across the central belt of the UK. This area extends coast-to-coast from Lincolnshire in the East, to Wales in the West, taking in the East and West Midlands, including Hereford and Worcester and extending as far north as Sheffield and Doncaster.

The move sees TDT Machine Tools bolster its already extensive portfolio with a range of high-specification lathes based on robust build quality. The agreement is yet another example of reputable machine tool builders placing their trust in TDT, which is enjoying a fast-growing reputation, not just for sales, but for comprehensive aftersales support.

CMZ has been manufacturing class-leading lathes for more than 70 years. This family business, founded in the town of Zaldibar, near Bilbao, has grown exponentially in recent years to acquire global prestige in the machine tool sector.

CMZ manufactures almost 500 lathes per annum, all of which are designed to offer a life cycle of over 20 years. Over the past three years, growth at CMZ of seven percent, 16 percent and 23 percent, highlights the increasing popularity of the company's machines.

Phil Terry, sales director at TDT Machine Tools, says: "As many within the machine tool industry are aware, CMZ is a hallmark for quality. These machines are built to last for decades, without any compromise in precision or reliability. Importantly, we can supply standard CMZ lathes from factory stock in one week, which compares favourably to the five weeks typically required for machines from the Far East. Even CMZ lathes built to customer specifications are available on short lead times."

TDT Machine Tools is able to offer the full CMZ range, which extends from small two-axis lathes, through to 18-axis triple-turret high-productivity turning



centres featuring sub-spindles. Swing diameters of up to 950 mm and 3,250 mm between centres, can be provided. As a further mark of quality, CMZ lathes feature high torque, high power, oil-cooled integrated spindle motors. The machines are Industry 4.0 compatible and can be fitted with CMZ own gantry-loading automation if required.

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Doosan vertical lathe investment proves to be instrumental

New Doosan vertical lathe investment is more than instrumental in helping leading precision subcontract specialist consolidate and grow its aerospace business

Mills CNC, the exclusive distributor of Doosan machine tools in the the UK and Ireland, has recently supplied a new, large-capacity vertical turning lathe to Unilathe Ltd, a leading precision subcontract specialist based in Stoke-on-Trent.

The machine, a FANUC controlled Doosan VT1100, was installed at Unilathe's 82,000 sq ft facility in August 2019 and has been positioned adjacent to another Doosan VT1100 machine to create a flexible, high-productivity vertical turning cell.



Since being installed, the new Doosan VT1100 vertical turning lathe has been used to machine a range of complex, high-precision and performance-critical components for customers operating in the aerospace, oil and gas, off-highway, mining, rail and special industrial equipment sectors.

These components, machined in small batches, are large, heavy and awkward-shaped. They are made from hard and difficult-to-machine materials that include titanium, inconels, nickel-based alloys, Heat Resistant Super Alloys (HRSA) and Jethete, a corrosion-resistant, hardened and tempered steel, to name but a few.

Investment rationale

Unilathe is a company committed to continuous improvement and has an ongoing programme of making strategic investments in its people, plant and equipment as well as its systems and processes.

A primary objective behind the new VT1100 investment was Unilathe's desire and determination to secure new aerospace business.

Andrew Sims, Unilathe's managing director, explains: "We have been active in the aerospace sector for a number of years and have an international reputation in the sector for quality, lead time fulfilment and cost competitiveness.

"Our ambition is to significantly grow this side of our business and to strengthen our position in the supply chain."

"Our efforts have been and are focused on repositioning Unilathe

in the sector. We want to move away from being perceived as a company that only offers first and second stage machining of castings and forgings to one that can machine and deliver high integrity components from start to finish to aerospace customers, similar to what we provide for customers in other sectors and industries."

Integral to the success of Unilathe's repositioning strategy is ensuring the company has access to high-performance machine tools that deliver excellent cutting performance and unrivalled process reliability.

A strategic audit undertaken by the company examined its internal machining capabilities and revealed that its future aerospace ambitions would be well served by strengthening its vertical turning capacity and, in particular, by acquiring an additional vertical lathe adept at undertaking roughing, semi-finishing and finishing operations on aerospace components like rings, seals and rotor shafts.

Andrew Sims continues: "We pride ourselves on machining high-quality components within budget that are delivered on time, every time. To do this we rely on proven machine tools that are fast, accurate and flexible."

The Doosan decision

Unilathe is no stranger to Doosan machine tool technologies supplied by Mills CNC. In addition to its first Doosan VT1100 vertical lathe the company has, in recent years, also invested in a large-capacity Puma 480 lathe and a large and powerful DBC 130 horizontal borer.

Andrew Sims says: "We are an advocate of Doosan machine tools. They perform well, are reliable and represent good value. The fact that they are backed by Mills CNC's applications and after-sales service and support, makes them even more of an attractive proposition.

"Our first VT1100 machine has proved to be a good investment, so when we were looking to increase our vertical turning capacity it was natural that we contacted Mills and enquired about acquiring a second machine."

Andrew Sims concludes: "We needed the new machine to be delivered and installed quickly - and Mills did not disappoint. Eight weeks after order confirmation the new VT1100 was delivered to our facility. Since its installation in August, the machine has been working virtually around the clock and hasn't missed a beat.

"Our VT1100 vertical turning cell has dramatically improved our capacity, productivity and machining flexibility and is a critical resource in helping us leverage new business opportunities in the aerospace sector."

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Mazak posts strong machine orders and looks forward to 2020

Yamazaki Mazak has posted strong results for machine orders in the UK and Ireland and is looking forward with confidence to 2020. The growth has been achieved across all sectors and machine classes with particularly positive performances in general subcontracting, aerospace and the oil and gas sector.

2019 saw a strong performance from Mazak's 5-axis machines, specifically the VARIAXIS series and the INTEGREX i-series. The company has also reported robust growth in the HCN series of horizontal machining centres, particularly in the oil and gas sector and the UK-built QT machines.

Mazak's laser division also continued to make inroads into the UK market with a strong order book that has led to continued increase in market share.

Alan Mucklow, managing director UK and Ireland, states: "2019 has been an excellent year for machine orders in the UK, with a continuation of the recovery in the oil and gas sector, a strong showing in aerospace

and a resilient general subcontracting base that has continued to invest in new technology.

"I'm also delighted with the performance of our laser division, which continues to build its position in the UK market."

Looking forward, Alan Mucklow is bullish about prospects for 2020, particularly with the range of new technologies that will come to market in the new year and the recent investments in the UK manufacturing facility coming fully online.

He concludes: "The EMO machine tool show in Hannover last autumn always drives the introduction of new technologies in Europe for the two years following each show. Our own follow-up Open House, EMO Encore, was an outstanding success with more than 600 visitors over the three days and UK machine users can look forward to seeing many of these technologies, including our new CV5-500 5-axis machine which will be made in the UK, new gear



cutting technologies and our new artificial intelligence CNC, at MACH in April 2020.

"Over the course of the year we have also made significant investments in our Worcester manufacturing facility, including two new INTEGREX robotic manufacturing cells that will come fully online in the new year and give us significant extra manufacturing capacity. We believe we are in a strong position going into the new year."

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Family business enhances its factory with Haas

G Zero Machining Services is a family-run engineering business. Led by managing director Shaun Hackney, with his sons Andrew and Steven and son-in-law Cameron alongside him, the team has enjoyed huge success in its first few months of trading.

After Andrew Hackney began writing programs for other companies, he realised there was also a demand for expert CNC machining. He knew his customers wanted their parts manufactured in the UK, rather than risk quality issues and lengthy lead times when sourcing from overseas. The family came together to create G Zero and found an ideal premises sitting on the edge of the Peak District National Park in Derbyshire.

With the first order secured, Shaun Hackney gave his local Haas sales manager a call. He explains: "We'd all worked on Haas machines before, so we knew what we were getting. We really like the Haas control, because it's so user friendly and identical on each machine, it makes the work so much easier to have that continuity."

With its first investment G Zero purchased

two Modular Mini Mills, a VF-2SS Super Speed vertical machining centre with 5-axis trunnion rotary table and an ST-10 lathe. These were followed a few months later with a second VF-2SS, purchased to open the working envelope without the need to remove the trunnion.

The VF-2SS has a 12,000-rpm spindle and high-speed 24+1 side mount tool changer. The Modular Mini Mill packs a 40-taper spindle into a small footprint, with a range of bolt-on production enhancing modules.

"The machines are the perfect size," enthuses Shaun. "We don't want to machine anything larger than handling size, so they fit everything we want to do and they're fast."

"The ST-10 is a lovely machine to use. We were all novices when it came to turning, but we've come a long way in a short space of time. Haas allowed us to bank our training, so when we were ready the engineer came to us for three days and guided us step by step."



Shaun Hackney concludes: "We're very pleased to have brought Haas into our factory. We always wanted to buy new to guarantee the accuracy of the machines. The price was great and the after sales has been brilliant, their support has been invaluable."

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Leading safety technology manufacturer calls for greater awareness on dust

The damaging effects of harmful particulates found in construction material manufacturing and at construction worksites across the globe is becoming a major cause for concern, alerts leading safety technology company, Trolex.

Construction dust inhalation has been linked to several diseases, such as asthma, lung cancer, chronic obstructive pulmonary disorder (COPD) and silicosis. According to research by the Health and Safety Executive (HSE), silica inhalation is linked to the deaths of 500 construction workers per year, while around 4,000 people die each year from COPD as a result of occupational hazards.

Joanne Poole, international sales manager at Trolex, states: "Although many people in the construction sector shrug off the risks posed by dust inhalation, it's a very real danger. Construction workers are attuned to the necessity for PPE such as hard hats, high-vis clothing, protective footwear and so on, but not necessarily aware of the health risks posed by what they may be breathing in, particularly if they are involved in work such as cutting and grinding.

"The perceived wisdom 'it's just dust' is something we need to address, as ultimately it's not just dust, fine particles from inert materials and hazardous particulates, such as asbestos and silica dust, can cause serious long-term health problems."

HSE (UK) identified the three main types of hazardous particulates found on construction sites include silica dust, wood dusts and lower-toxicity dusts. The Control of Substances Hazardous to Health (COSHH) regulations set a limit on the amount of these dusts that workers can breathe, which is estimated to be around a 40,000th of a teaspoon.

Environment Protection UK notes that smaller dust particles found in industrial locations can travel further distances, so that even employees not directly on site can suffer from the damaging effects of dust inhalation. Smaller particles also travel further into the respiratory system too, causing even greater long-term health damage.

"Although employers must carry out monitoring to comply with the minimum health and safety standards, a lot of the dangers lie in the dust that we can't see, making it even more vital workers do as much as possible to educate themselves on the hazards posed by particulates and the need for effective monitoring of their working environment," adds Joanne Poole.

Trolex developed its pioneering AIR XD Real-Time Dust Monitor, which uses lab-grade precision laser technology to continuously measure particulates of multiple sizes in harsh and hazardous environments, helping employers make informed decisions on how to ultimately improve air quality and protect the health of its workers.

Currently, 18,000 new cases of work-related respiratory illness are recorded every year in the UK, according to the Labour Force Survey. Most serious health conditions, caused by breathing in dust particles, are as a result of repeated exposure over long periods of time, as it starts to build up in the lungs. Unfortunately, this means that by the time that the health effects become noticeable, the damage caused may be life-threatening.

Joanne Poole concludes: "Construction dust may appear



harmless, but we can't stress enough the long-term damage this can have on healthy people in the workplace. We want to encourage employers to protect their employees and their work environment through education and the deployment of effective health and safety measures, which can range from the use of a simple face mask to sophisticated particulate monitoring equipment, such as the AIR XD."

Trolex has over 60 years' experience designing high-quality monitoring equipment for use in the world's toughest environments.

The company is a global supplier of gas and dust detection, connector solutions and safety and infotainment systems to the mining, industrial and transportation sectors. Its products are deployed in over 100 countries by some of the world's leading corporations to protect their people and assets, maximise efficiency and improve the experience of workers and passengers. It offers the latest in wireless gas and dust detection technology and ex connectors and provides fully engineered solutions to meet the diverse needs of its customers.

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Lowering the risks with the right Personal Protective Equipment (PPE)

Arco's reputation is built on creating solutions with people in mind and working with customers to provide the widest range of Personal Protective Equipment (PPE) that meets the needs of employers and employees everywhere.

It's range of PPE includes the biggest names in the field, products known and trusted by employers and employees around the world, as well as exclusives that offer great performance with extra value.

Every Arco PPE product has been expertly assessed to ensure it does what it should. If a product doesn't meet both legal requirements and the company's own stringent standards, then it is not stocked. This assures customers that when they buy PPE from Arco, they are buying products that work.

Arco stores stocks a wide range of personal protection products. You can compare products and prices, ask expert staff to demonstrate product benefits, browse and take PPE purchases away on the day.

The business has been built on providing personal protective equipment for people in their workplace. Head, eye, hearing and respiratory problems occur when people at work are exposed to a hazard without wearing the correct protective equipment, or when using badly fitted equipment.

On the Arco website pages you'll see the most comprehensive range of PPE that can be found in the UK, from a safety helmet through to sophisticated fall prevention and arrest equipment, all backed by the expertise of the Arco team.

Arco's mission is to keep people safe at work. The fourth generation, family owned business is committed to delivering that mission through its core values. These values are more than just statements; they define its reasons for being in business and what it means to be part of the Arco family.

By investing in its own people, the company is able to offer expert advice and support to its customers. Since 2008, it has trained over 150 Arco staff in a range of professional health and safety qualifications, including IOSH and NEBOSH certification. It will continue to provide training to its

teams so they can offer practical support and sensible advice. The company offers the widest range of PPE in the UK. Its National Distribution Centre (NDC) holds an impressive 22,000 products and its network of over 40 branches cover the UK and Ireland, ensuring customers can source what they need when they need it.

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ITC launches new product lines at Manufacturing Supply Chain Ireland

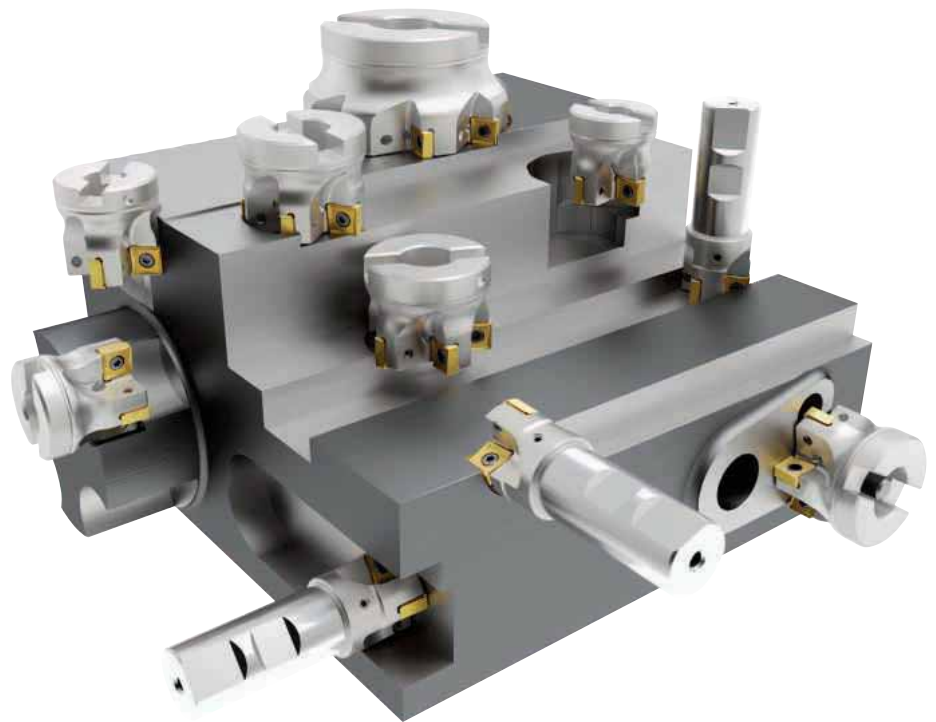
The Manufacturing Supply Chain Show at the Citywest Convention Centre in Dublin was the very first opportunity for Irish manufacturers to see the new 2020 cutting tool launches from Industrial Tooling Corporation (ITC). Using the January event as the launchpad for its new innovations, the Tamworth-based cutting tool manufacturer invited engineers to visit its stand to witness the next generation of cutting tool technology.

The new additions to the ITC portfolio that received a world premiere at the Manufacturing Supply Chain Show included the new ITC 6071 Series of solid carbide end mills. This stub-length end mill has been specifically developed for the high-performance machining of steel and aerospace grade alloys such as titanium and inconel. ITC has evolved the geometry design and extensively trialled this in the marketplace to introduce an end mill line that surpasses all that went before.

With an unrivalled reputation for aluminium machining, ITC has further extended its line with the arrival of the new 3202 3-flute long series and the optimised length 3203 Series ball nose tools. Perfect for profiling and reaching difficult to access surfaces, the 3202 and 3203 offer manufacturers the complete solution for cutting aluminium and aerospace grade alloys. Complementing the new additions is the much-anticipated arrival of the 4204 Series of long length 4-flute square-end milling cutters with a chipbreaker geometry.

Supporting the new ITC product lines at the showpiece event were the latest arrivals from Widia. Representing Widia in the UK and Ireland, application experts from ITC were on-hand to discuss the benefits of the new Widia product lines. Some of the latest Widia tools on show included the new VSM890-12 face and shoulder milling series. The new VSM890-12 is hailed as one of the very few 8-edged double-sided milling lines with genuine 90-degree milling.

The new high-performance milling line generates superior metal removal rates on a complete range of materials when conducting face, shoulder, Z-axis plunging and contour plunging and 100 percent radial engagement slotting. The new



VSM890 series is available with a 32 mm diameter Weldon end mill configuration while the shell mill tool bodies are available in diameters from 40 mm up to 250 mm with a cartridge face mill providing a 315 mm diameter.

The VSM890 was alongside the impressive Widia 70NS Victory X-Feed Series of high-feed end mills that have now been extended to cater for the machining of stainless steel and heat resistant alloys. The extension provides manufacturers that machine challenging materials, with all the benefits the 70NS demonstrates on steel, cast iron and a host of other material types. The 70NS Series provides a significantly increased radial engagement when compared to ball nosed end mills and this geometry revision has been optimised for circular plunging, 3D machining, face milling and pocketing applications on heat-resistant alloys and stainless steels.

Complementing the 70NS and the VSM890 at the Dublin event was the new Widia range of 4U50 and 4U80 shallow pitch roughing cutters. Perfect for stainless steel and high-temperature alloys, the new solid carbide end mills demonstrate reliable,

consistent performance at higher machining parameters when conducting prolonged machining cycles on challenging aerospace grade materials.

Designated as shallow pitch roughing tools for high material removal rates in the aerospace industry, the new Widia 4U50 and 4U80 Series is available with four or six cutting edges. They come with a harmonically designed flute geometry and the choice of a short cut length, 4U50 Series, for superior rigidity or a regular cut length, 4U80 Series, with both enhanced cutting performance and stability when conducting heavy-duty roughing.

ITC, of course, had a comprehensive display of existing product lines alongside the new innovations. The stand also displayed a myriad of new innovations from Widia as well as a selection of BIG KAISER toolholding and clamping technology.

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Expanding the options for efficient holemaking

Dormer Pramet has extended its range of Hydra replaceable head drills, launched a solid carbide drill for aluminum and added a new spotting drill.

Providing a highly cost-effective option for large diameter drilling, the Hydra program supports structural and general engineering applications. Its range of solid carbide heads, for steel, stainless steel and cast iron, are married together with a hardened steel body.

Existing body options, 3xD, 5xD and 8xD, have been expanded with a 12xD for deep hole applications and a 1.5xD option for improved rigidity in shallow hole and plate drilling.

Providing consistently high performance, even after numerous head changes, the range of bodies incorporates coolant holes to improve cutting efficiency and swarf evacuation. The exact fit between head and body maximises tool rigidity for superior hole accuracy and precise tolerances.

Also, one body can fit multiple solid carbide head sizes, reducing inventory requirements. In addition, heads can be easily changed without removing the body from the spindle, minimising machine downtime.

Meanwhile, Dormer Pramet has extended its Force hole-making assortment, with a solid carbide drill for all types of aluminum, from soft to abrasive grades.

The flute and cutting geometry of the new Force N range features a 32° helix angle. This helps to break swarf into small



manageable chips and reduce exit burr, which can occur when drilling soft materials.

Offering high metal removal rates and reduced thrust forces to improve hole quality and productivity, Force N is available in 5xD and 8xD lengths with through coolant. Dormer Pramet's existing assortment of solid carbide drills includes Force X for use across a variety of materials and Force M for stainless steel.

Finally, the company has launched a new solid carbide drill for fast and accurate spotting. The R125 has a 150° self-centering

point geometry, making it ideal for use with high performance drills with point angles around 140°.

Providing consistent performance and repeatability in all materials, a multi-layer TiAlN coating ensures longer tool life, improved cutting-edge stability and wear protection.

Milling a deeper path

Dormer Pramet has expanded its milling assortment for die and mould and general machining applications with several introductions.

This includes the new double-sided SNGX11 insert for high feed milling with up to 1.7 mm depths of cut.

A strong main cutting edge ensures high levels of durability and process security, especially when machining corners inside a pocket. With eight cutting edges, the square shaped SNGX11 also represents an extremely economical solution.

Suitable for copy milling, helical interpolation, ramping, progressive plunging and face milling, the SNGX11 is available in two geometries. M is for machining steel, but also hardened steel and cast iron. MM provides a smoother cut and is more suitable for stainless steel, soft steel and super alloys.

The range is supplemented by the new SSN11 cutter, available in diameters from 32-125 mm, with intermediate sizes for die and mould applications. All cutters feature a special through-coolant design to further improve process security and a high overhang to support deep milling up to 10xD.

Meanwhile, Dormer Pramet has added to its ADMX07 milling program with a new F geometry for finishing and semi-finishing applications. This sits alongside the existing M, FA and HF geometries and targets light machining of stainless steel and low carbon steels.

Extremely suited to vibration sensitive machining, the chip breaker features a highly positive geometry with narrow peripheral land. This reduces chatter and enables a smooth cutting action without burrs on the machined wall.

Significantly, it also supports lower cutting forces which not only reduces energy consumption, but also prevents work hardening, meaning increased durability





and longer tool life. The ADMX range is a universal 90° tool suitable for a variety of milling applications.

New burrs target demanding applications

Dormer Pramet has expanded its line of carbide burrs with new tools for machining superalloys and bolt removal. The alloy specific range has been designed to meet the most demanding metal finishing needs in nickel and titanium alloys.

With an advanced cutting geometry, the alloy specific (AS) burrs support high performance grinding and a smooth, controlled cutting action for a consistent high-quality surface finish. This makes the range ideal for deburring and chamfering in maintenance, repair and overhaul

applications, in industries such as aerospace and power generation.

With nine different shapes available, the AS burrs achieve a faster cutting action with high stock removal and is included in a new set, P88006, which features a variety of styles.

Meanwhile, Dormer Pramet has launched a new range of burrs specifically designed to prepare the clean removal of broken bolts, without damaging the threaded hole or the component.

Suitable for automotive repair shops and maintenance applications, the new burrs are available in plain cylinder with end cut and 150° countersink cut styles. A variety of diameters and cutting lengths cater for different thread sizes, with long reach and tapered shank designs for easy access.

A specially developed cutting geometry supports the grinding of case-hardened threads and maximises the potential for drilling on the centre.

The new addition supports Dormer Pramet's existing assortment of burrs for steel, stainless steel, non-ferrous material, plastic, fibreglass, composites and general machining.

Dormer Pramet is a global manufacturer and supplier of tools for the metal cutting



industry. Its comprehensive product program encompasses both rotary and indexable drilling, milling, threading and turning tools for use in a wide variety of production environments. An extensive sales and technical support service operate from 21 offices, serving more than 100 markets worldwide. These are assisted by dedicated production facilities in Europe and South America and a highly developed distribution and logistics network.

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AluLine provides the complete package for non-ferrous machining

Team Cutting Tools from CERATIZIT has completely revamped its range of high-performance solid carbide milling cutters for machining aluminium and other non-ferrous materials. The new AluLine series is a complete package of cutters that extends to over 2,500 types covering rough and finish machining, with users having multiple choices of corner preparation with sharp, chamfered, radiused or ball nose styles all available. AluLine is available in diameters ranging from 2 mm through to 25 mm with a variety of flute and length configurations. They are available as standard products with the Team Cutting Tools guarantee of next morning delivery for any cutter ordered prior to 6:30 pm the previous day.

AluLine performance is enhanced through use of CERATIZIT's extremely wear resistant Diamond Like Carbon (DLC) which provides up to 80 percent of the hardness of natural diamond to protect from damage caused by built-up edges or abrasive alloy accretions in order to deliver extended tool life and elevated cutting data. Where the application demands it, uncoated cutters also available across much of the range as standard. Further enhancing customer choice is the wide variety of flute geometries with variable depth flutes, polished flutes and various flute lengths available.

"The completely new range of AluLine solid carbide cutters now provides the



widest choice for machining aluminium and non-ferrous materials thanks to the combination of substrate, geometry and DLC coating along with the ex-stock availability of such a diverse range of cutter styles. The addition of even more choice when it comes to corner radii, ranging from 0.3 mm to 4.0 mm, will be of particular interest to the aerospace sector. As part of the WNT performance series users of AluLine cutters can be reassured that they are purchasing a premium product developed to meet the highest demands placed on them," says Tony Pennington, managing director of CERATIZIT UK & Ireland.

Team Cutting Tools keeps you UP2DATE with latest developments

Team Cutting Tools from CERATIZIT has launched its latest UP2DATE publication containing 122 pages of the latest cutting tool developments from the CERATIZIT Group. The latest UP2DATE focusses on brand new developments and upgrades with indexable inserts from Cutting Solutions by CERATIZIT and rotary tools and workholding from WNT, two of the Team Cutting Tools product brands.

Key among the many innovations announced in UP2Date is the new CTPX710 multi-purpose insert grade from CERATIZIT. With the latest Dragonskin coating and carbide substrate, this new grade delivers outstanding performance when machining stainless steel and super alloys, but also across many other applications including non-ferrous materials. The result is that for

customers only one grade of insert now covers virtually every application that they may come across, saving cost and inventory while also simplifying the selection process for operators.

From WNT there is a wide variety of new products announced, including the full revamp of extremely popular SilverLine range of solid carbide milling cutters. With such a popular range as SilverLine, great care has been taken to ensure users see a marked improvement over the previous cutters. The result is typically 50 percent greater tool life in terms of metres of cut and 30 percent increase in process security. Several changes to the cutters are behind these increases, including updated Dragonskin coating, optimised core geometry and improved chip clearance. The MultiLock exchangeable head milling system is also brand new, providing significant advantages compared to solid carbide milling cutters when used in machining applications such as aerofoils and mould and die, where long overhangs are common. The requirement for less carbide to be used in MultiLock cutters, along with developments in sintering technology that eliminates the need for grinding of the cutting edges, means cost are lower and the environmental impact is reduced due to less raw material required in the manufacture.

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New alligator range has a ferocious bite

The 'Infinite Possibilities' mantra of the cutting tool experts at Quickgrind, has now been extended to its portfolio of 2-flute end mills. Creating what is now an unprecedented number of end mill solutions, Quickgrind has introduced its new Alligator Duo series of 2-flute end mills.

The Tewkesbury cutting tool manufacturer has launched its new Alligator Duo Series of 2-flute end mills with standard and aluminium geometries to meet the diverse application range of the manufacturing sector. The solid carbide Alligator Duo Series of end mills can be designed and specified to the requirements of the end-user as part of the range.

Not setting its stall on 'standard' catalogue dimensions, Quickgrind is offering the new Alligator Duo Series in a



complete range of lengths and diameters with the choice of a long reach and short flute geometry, a long reach and long flute or even as a stub length tool for optimal rigidity. This gives the end-user the option of additional reach with uncompromising levels of stability or stub length tools that can generate surface finishes beyond compare. Whatever the machining specifications of the customer, Quickgrind can meet the needs of the end user with a high-quality end mill that is delivered to a particularly short lead-time, a lead-time that is the envy of the industry.

The Alligator Duo is available with several geometry options to cater for applications as diverse as roughing, semi-finishing, finish machining and even profile machining. Quickgrind can also provide the new Alligator Duo Series with a square-end or ball nose configuration to cater for profile machining applications. In addition, Quickgrind can offer the Alligator Duo with a 'zero-dished' option for fine surface finish machining on flat surfaces.

The team at Quickgrind can deliver productivity gains by optimising metal



removal rates and tool life. The in-house experts achieve this by understanding customers' goals and then applying its proven processes and expertise to match client application requirements with the correct technology adoption.

By doing this, Quickgrind will improve performance from a productivity and cost perspective. When manufacturers realise that there is little cost difference between standard 'off-the-shelf' products and bespoke tailored solutions, that is when they become Quickgrind customers.

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T2500Z cermet grade for excellent machined surface quality from Sumitomo

Cermets are titanium carbide-based (TiC, TiCN) hard metals, meaning a compound of ceramic particles in a metallic binder. Compared to tungsten carbide, cermet has better wear resistance and less tendency to build up cutting edges.

Cermets, with titanium compound as the main component, have low affinity with iron, providing a glossy machined surface on ferrous metals. Cermets have also been attracting attention in recent years for using only a small amount of tungsten, which is a scarce resource.

Sumitomo's newly developed cermet substrate T2500Z with excellent thermal conductivity, improves thermal crack and notch wear resistance. Thanks to its Brilliant Coat® technology, T2500Z achieves excellent wear and adhesion resistance, providing stable and excellent machined surface quality in various work materials such as bearing steel, carbon steel and alloy steel.

Brilliant Coat has excellent lubricity and significantly reduces reactions with ferrous

metals. This greatly reduces the formation of built-up edges and thus significantly reduces the risk of fractures. Additionally, the wear resistance has been improved by over 1.5 times as compared to conventional products. T2500Z not only provides beautiful finished surfaces but also a longer tool life in the finishing process.

SUMITOMO ELECTRIC Hartmetall GmbH develops and manufactures a comprehensive range of cutting tool materials. It's headquarters in Willich near Düsseldorf organises the sales, logistics and marketing for Europe, the Middle East and Africa. Its customers are guaranteed competent technical advice via highly qualified consultants and application engineers. The European production facilities are located in southern Germany and in the Czech Republic.

The company is proud of its European Design & Engineering Centre (E-DEC) based in Lauchheim. 2,000 sq m of presentation, training, and meeting rooms were created to present theory-based trainings and



practical machinery presentations while the latest technologies enable demonstrations of tools and systems in action. Workpieces can be machined, the production processes can be optimised and together the acquired expertise can be evaluated and confirmed directly on the machines in the presentation centre. Customers receive the complete solution, which they can subsequently transfer to their own production.

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New tool for turning titanium can be monitored with sensors

A new insert geometry for grooving and parting off titanium has been introduced by German tool manufacturer, Horn. It ensures reliable chip breaking and a soft cut, leading to high feed rates and fast machining times. Additionally, tool longevity is increased by up to 60 percent. Type 224 inserts with the new WT geometry are available in increments of 2, 2.5 and 3 mm in carbide grade IG35 and are designed for Horn's H224 tool holders.

Coupled with this development, the Swiss group Kistler, working closely with Paul Horn GmbH, has developed a novel system for real-time monitoring of tools used in micro turning applications. The Piezo Tool System (PTS) consists of a force sensor inserted into the turning tool holder that provides information on the condition of the tool during cutting.

The small piezoelectric sensor, which can be replaced easily and quickly, can measure

even the tiniest of cutting forces to a high resolution. A machine operator is immediately able to identify a defect in the material being cut or a tool breakage, resulting in minimum scrap, maximum quality, lower production costs and increased productivity.

In micro turning applications, alternative measuring systems are not practical. Monitoring the drive power of the spindle motor is not able to detect the minute variations. Measuring acoustic emissions does not deliver satisfactory results consistently when small workpieces are being machined. Visual monitoring also has to be ruled out, as coolant together with the high rotational speeds would obscure the view of the machining process.

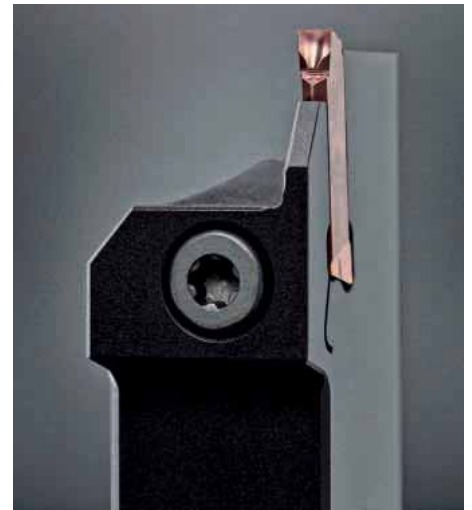
The new PTS solution is compatible with selected standard turning toolholders from Horn, does not require any adjustment to be made at the control and can be used on any lathe.

Boehlerit expands 3D milling system

Under a joint sales cooperation with Boehlerit, Ringwood-based Horn Cutting Tools has introduced to the UK market an expanded 3D milling programme for the tool and mould making industry.

The ISO 00P is a universal tool system for general mechanical engineering and mould making. As the inserts are mounted in a neutral position in the toolholder, they ensure a high level of contouring accuracy. Despite the neutral position, the edge geometry enables a soft cut to be achieved.

With the RHOMBItec system, Boehlerit is presenting a universal finishing tool for all standard materials and applications. The indexable inserts demonstrate high manufacturing precision and long tool life.



The axial and radial wiper geometry ensures high productivity, outstanding surface quality and vibration-free finishing, even at high depths of cut.

The BALLtec and TORROtec milling systems are multi-functional tools for achieving high productivity. They allow users to save on toolholders, as the ball nose copying tools are suitable for semi-finishing and finishing.

In addition, Boehlerit offers a wide variety of indexable inserts and toolholders. The carbide shank with brazed insert seat ensures excellent vibration damping, resulting in exceptional surface quality on the workpiece. The use of ultrafine carbides for the inserts ensures high wear resistance combined with elevated fracture resistance, which increases process reliability. All variants have an internal coolant supply.

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Collet for CoroChuck 930 maximises pull-out prevention

Cutting tool and tooling system specialist Sandvik Coromant has introduced a new collet for its CoroChuck® 930 high-precision hydraulic chuck. Designed to suit Weldon shanks, the new collet features a mechanical locking interface to prevent tool pull-out or movement when producing expensive components and/or machining with challenging cutting data.

Mats Backman, global product manager at Sandvik Coromant, says: "Being 100 percent assured of zero pull-out for Weldon shanks when producing high value-added parts, such as aerospace frame and engine components, is paramount in the highly competitive manufacturing arena. Production engineers and managers are under constant pressure to minimise scrap and maximise bottom-line profitability. These thoughts were the driver for developing the new collet."

The mechanical locking interface acts between the collet and chuck and between the collet and shank. Having confidence in no pull-out when both collet and chuck are

locked enables increased productivity in heavy-duty applications. Further benefits include easy assembly into CoroChuck 930 chucks, both slender and HD versions, while high run-out accuracy is assured with cylindrical clamping of Weldon shanks. In addition, coolant supply through the collet provides secure and reliable coolant delivery to the tool.

Ultimately, this new solution will benefit any machine shop seeking trouble-free machining in heavy applications. No pull-out or tool movement protects against the potentially sizable cost of reworking or scrapping an expensive component. Pull-out effectively changes the gauge length of the tool mid-cut, leading to the generation of features with incorrect dimensions or crash marks.

To provide an example of the potential gains on offer, a customer case trial saw CoroChuck 930, featuring the new collet, used for a milling operation on a CNC turn-mill machine. The objective was to produce a twin-screw from 42CrMo4 alloy



steel. At cutting data of 3,220 rpm spindle speed, 1,500 mm/min, 590 in/min, feed speed, 10 mm, 0.394 inch, axial depth of cut and 20 mm, 0.787 inch, radial depth of cut, the mechanical locking interface generated a stable process with no pull-out. In addition, productivity increased due to longer tool life.

Collets are available to suit an assortment of common Weldon shank sizes. Accessories include assembly tools and anchor screws.

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Kennametal makes hard turning more cost-effective

New KBH10B and KBH20B PcBN grades deliver higher productivity and lower cost-per-part

Kennametal has announced its latest innovation in hard turning-KBH10B and KBH20B PcBN grades, double-sided inserts for materials up to 65 HRC.

The new grades are specially designed to deliver higher productivity and longer tool life when turning tool steels and other hardened materials.

"Kennametal's new KBH10B and KBH20B grade inserts are an excellent choice for high-volume production of hardened gears, shafts, bearings, housings, and other drivetrain components, where tooling cost per part is an important metric," says Robert Keilmann, product manager for turning at Kennametal.

Polycrystalline cubic Boron Nitride (PcBN) mini-tipped inserts have long been recognised as a great option for reducing part cost when turning hardened steel components. Kennametal's new grades of PcBN inserts improve upon that value proposition by delivering increased productivity with a lower cost per part.

Patented ceramic binder structure and

TiN/TiAlN/TiN coating provides extreme wear resistance even at elevated cutting speeds. A gold PVD coating makes it easy to identify when an insert needs indexing, while the numbered corners assure that a machine operator won't inadvertently switch to a used edge.

Two edge preparations, in a trumpet style hone, for heavier and interrupted cuts and a light hone for continuous turning are key features. Both are free cutting, further extending tool life and generating surface finishes down to 0.2 Ra.

The PcBN mini-tips are offered in four insert shapes, three rhomboidal and one triangular, which means up to six cutting edges per insert.

With over 80 years as an industrial technology leader, Kennametal Inc. delivers productivity to customers through materials science, tooling and wear-resistant solutions. Customers across aerospace, earthworks, energy, general engineering and transportation turn to Kennametal to help them manufacture with precision and



efficiency. Through the skill and innovation of its people, the company delivers industry-leading tools and technologies that solve customer challenges and enable exceptional performance.

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Tungaloy's new R2 insert eliminates finishing processes

Tungaloy is expanding its TungForce-Feed line of indexable small-diameter high feed milling cutters to include R2 inserts that feature a corner radii of 2 mm. Available in diameters of 8, 10, 12 and 16 mm, the TungForce-Feed line ensures high productivity levels and it is an economic profiling solution for the mould and die industry when compared to conventional solid end mills and indexable tools of similar size.

When designing a CAM program for high feed machining of complex 3D profiles in typical mould making applications, it is common to use a theoretical corner radius for programming the insert radius. This method leaves excessive stock on the workpiece after machining, adding processes. To create the ideal platform for the subsequent finishing process, many job shops are using solid carbide square end mills with large radii in the roughing process. The new R2 inserts require no programming for the theoretical corner radius as its 2 mm corner radius leaves no uncut material on the machined surface. This ensures that the TungForce-Feed series makes a good replacement for costly solid carbide end mills, helping customers reduce tool costs.

With an insert design that is 10 percent thicker than competitor products, the TungForce-Feed line is built to perform at higher



machining parameters by withstanding fracture forces. Furthermore, the robust insert screws and seat design reduce screw neck shearing under high cutting forces. The insert design incorporates a positive inclination angle that promotes smooth chip evacuation that further reduces cutting forces by controlling chip formation, especially when shoulder and slot machining.

Perfect for face and shoulder milling as well as helical interpolation and ramping, the close insert pitch makes the TungForce-Feed line a formidable option for all your milling applications. The new series has been designed with a small entry angle for chatter stability that significantly improves efficiency and tool life even when machining in long reach areas.

The new R2 insert has an optimised geometry that gives it the potential to perform as a full profiling insert that is ideal for semi-roughing and semi-finishing processes. The free cutting geometry eliminates chatter and improves surface finish quality and, when this combines with the built-in side wiper that helps reduce burr formation on walls and corners while improving wall accuracy, the TungForce-Feed line proves itself as the ultimate performer for the mould and die market.

The TungForce-Feed line is available in two insert designations that include the AH3225 and AH8015 grades. The AH3225 grade incorporates nano multi-layer coating technology with three major properties for optimal cutting-edge integrity. This increases resistance to wear, fracture,



oxidation, built-up edges and delamination. The AH8015 designation has a hard coating layer and carbide substrate with a strong resistance to wear, heat and built-up edges, this makes it ideal for machining hard or difficult materials. The two grades provide optimal machining performance on materials from carbon, alloy, pre-hardened and stainless steels through to cast iron, titanium and heat resistant alloys.

Tungaloy is a leading manufacturer of carbide cutting tools, friction materials, wear resistant items, and civil engineering products. Headquartered in Japan, it provides its products to customers all over the world in automobile, construction, aerospace, medical, power generation, infrastructure, and heavy industries.

Continuous improvement of production technologies, combined with large investments in research and development, allows it to offer high-quality products that help manufacturing companies in a wide variety of industries increase their productivity.

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Walters's new HU5 geometry inserts put more performance into ISO M and S machining

With its new single-sided Tigertec Silver indexable inserts, with HU5 geometry specially developed for the heavy roughing of stainless steels and high-temperature alloys in the ISO M and S groups, tooling expert Walter GB says that as the inserts have a larger contact surface to the toolholder and therefore increased stability, than double-sided inserts, the user gains a number of advantages.

These include greater cutting depths, higher feed rates at low cutting forces thanks to the curved cutting edge and deep chip breaker groove, which consequently reduce machining temperature, improved metal removal, in one test 18.36 litres/hour instead of 10.71 litres/hour, increased tool life of up to 75 percent, courtesy of the variable rake angle in the area of the corner radius, which permits soft chip reforming.

The main cutting edge, which is protected by a negative chamfer, prevents fractures when machining hard edge zones and optimises the performance on, for example,

forged parts. Machining of components needing interrupted cuts and other demanding operations are equally viable. Customers machining materials such as AISI 316, Inconel 718 and titanium, in particular, will gain particular rewards.

Available in the standard basic shapes of CNMM, DNMM and SNMM, the HU5 geometry means Walter now offers 12 geometries in six grades, as well as tools with precision cooling and ceramic or CBN inserts for the ISO M and S workpieces.

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



It demonstrates its engineering competence at every stage of the machining process. As an innovative partner capable of creating digital process solutions for optimal efficiency, Walter is pioneering Industry 4.0 throughout the machining industry. With over 3,500 employees worldwide, together with its numerous subsidiaries and sales partners, Walter AG serves customers in over 80 different countries.

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LMT Tools develops partnership with Liebherr

LMT Tools, a leading specialist for the development and production of precision tools and Liebherr-Verzahntechnik GmbH, a leading manufacturer of CNC gear cutting machines and automation systems, are collaborating to continue the success story of the patented ChamferCut method. At last year's EMO exhibition, the two technology partners signed a cooperation contract for the new ChamferCut-CG (Collision Gear) and ChamferCut-IG (Internal Gear).

With the ChamferCut cutting method offered by LMT Fette, LMT Tools raised the process of chamfering and deburring gears to a new level some years ago. In close collaboration with Liebherr-Verzahntechnik GmbH, the tool specialist was responsible for launching the first evolutionary stage. Accordingly, the gear machine manufacturer based in Kempten has co-designed and supported development of this innovative technology, including in the form of specially developed gear hobbing and chamfering machine designs.

With the new ChamferCut-CG and ChamferCut-IG, this successful partnership

is now entering its second round. At EMO, Daniel Ehms, CEO of LMT Tools and Dr. Hans Gronbach, managing director of technology at Liebherr-Verzahntechnik GmbH, signed a corresponding cooperation agreement recording mutual exclusivity.

Liebherr already enjoys by far the largest penetration of the market for ChamferCuts offered by LMT Fette. Now, thanks to the new agreement, these latest extensions also enable users to benefit from the high degree of process and application competence as well as long-term expertise offered by these technology partners.

"We have already been linked to Liebherr-Verzahntechnik GmbH for several years by means of a very close and agile cooperation which goes well beyond a basic supplier-customer relationship," emphasises Daniel Ehms. "This strong partnership is also the result of similar values and goals which we share as companies and premium manufacturers driven by innovation. We are, therefore, particularly delighted that Liebherr is once again at our side with ChamferCut-CG and



ChamferCut-IG and joining us in designing technological progress."

Innovative technology, tailored machines and custom-fit solutions underline the comprehensive approach pursued by LMT Tools and Liebherr-Verzahntechnik GmbH in their joint activities. By developing their partnership, these technology partners will be linking their competences even more strongly in the future. The new ChamferCut tools also see this experienced team relying on consistent customer orientation, during process design and implementation, while supporting the customer to develop the very best manufacturing strategy.

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Rotary tables from Eppinger

Eppinger has entered into a new business sector for the first time. The manufacturer of innovative tool systems and toolholders presented a range of rotary tables for machine tools at the EMO exhibition last year. The new rotary tables are available with rotary plate sizes from 160 mm to 320 mm and are suitable for both initial installation and retrofitting of vertical and horizontal milling machines.

"We have used more than 30 rotary tables of different brands at our production sites for many years," says managing director Uwe Eppinger. "That's why we are well aware of the pros and cons of installation, flexible application, maintenance costs and decreasing accuracy."

The increasing degree of automation in production also requires a more compact design of the rotary tables which allows the use of suitable clamping devices without restricting the required travel distance of the machining axes too much.

Although the existing market is already highly competitive, Eppinger has decided now is the right time to offer an alternative solution: "Our rotary tables differ significantly from existing solutions. They have been used for some time in our own manufacturing where they gradually replace the third-party products," explains Uwe Eppinger. "We were not always satisfied with the products that have previously existed on the market.

"For our own production of tools, wheel gears and gear units we need the rotary tables that can be quickly and precisely positioned, which are extremely compact and suitable for fine grinding as well as for rough milling operations. In addition, they should be easily integrated into existing vertical and horizontal machining centres and used there in a flexible way. Since we could not find suitable rotary tables on the market for our specific requirements in this specific combination, we developed them ourselves."

The company was able to rely on its many years of experience in the design and manufacture of high-precision components for machine tools as well as in drive technology. Uwe Eppinger explains: "The

high requirements to the positioning accuracy and compactness could only be achieved with a preloaded drive system and integrated angle measuring system. When developing the rotary tables, we thought very hard to come up with an absolute innovation on the market."

The concept seems to work. An essential distinguishing feature to other rotary tables is the preloaded, backlash-free twin-engine drive which allows quick indexing even without clamping. Furthermore, an



integrated angle sensor on the rotary plate ensures the highest positioning accuracy even with changing loads. Although this principle is already used for larger rotary tables, the company discovered, for the first time, a more practicable solution to also implement this for rotary tables with rotary plate sizes from 160 mm to 320 mm."

Although the angle measuring system integrated into the housing measures the angle directly on the rotary plate and compensates for mechanical interferences, the preloaded drive makes it possible to set up a high control loop gain. Only in this way it is possible to make the bidirectional positioning extremely precise in the angular seconds range.

To integrate into already existing machines, the company relies on a

plug-and-play concept. This applies both to the connection of the rotary tables within the processing area of the machine, via splash-proof plug connector, as well as to the electrical connection to the machine control system, via a specially developed machine interface unit.

Thus, the rotary tables are suitable both for the initial installation as well as for the retrofitting of vertical and horizontal milling machines. When placing the rotary spindle, precision classes from 3 µm down to 1.5 µm

in lapped or ground execution are available, both for radial and axial run-out.

An obvious benefit is the multi-disc clamp which is installed as standard. It ensures a strong clamping at high machining forces, since it clamps the rotary plate directly. Apart from a high clamping torque, a high torsional rigidity is achieved which in turn ensures high surface qualities with changing cutting forces.

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Leader supports multi-axis manufacturing

Leader Chuck Systems has recently added the Exact Machinery range of precision CNC rotary tables and indexing units to its extensive product portfolio. The Taiwanese company has over two decades' experience, continuously developing new and innovative products to improve the manufacturing processes and productivity for precision engineering companies in every industrial sector. The ISO 9001 accredited 180-strong company produces over 3,000 units each year at its 4,800 m² state-of-the-art manufacturing facility.

The NCT, TRT and ERT range of worm and wheel drive CNC tilt and turn rotary tables are available in a wide range of sizes, from 125 to 500 mm diameter. They feature a wear-resistant design with high rotational torque, dynamic accuracy and easy installation and maintenance. Rotary tables expand any machining centres production capacity.

Mounted in either a horizontal or vertical plane, these tables are used to add 4th and 5th axis capability. Inside the rotary tables, the worm shaft and worm gear system define the accuracy and life of the table. Through the strict inspection and in-house machining of the worm system, Exact guarantees products optimal performance and high dynamic durability.

Material selection for the rotary tables includes special high-tensile aluminium-brass equal in strength to a steel alloy for the worm gear and a hardened alloy steel for the worm shaft. The combination of brass and alloy steel offers less friction so the rotational motor torque is transferred efficiently. The worm gear has a large pitch diameter that creates a large engagement area and less pressure on the contact surface, resulting in increased wear resistance.



The HC range of automatic indexing tables can be used with the worktable in either the horizontal or vertical plane, and are suitable for use on machining centres, rotary transfer machines and almost any type of manufacturing system. Sizes range from 200 to 500 mm diameter and up to 1,800 x 1,800 mm for the heavy-duty models. Rotation is by a worm and wheel driven via a servo motor, hydraulically clamped through a three-piece coupling that generates a resistance to high machining forces for outstanding positioning accuracy and rigidity.

Featuring a non-lifting, Hirth coupling design that has an exceptional holding force and a working surface that does not raise and lower during indexing, it allows a solid sealing system to prohibit swarf, chip or cutting fluid ingress into the housing for reliability and longevity. Hydraulic rack and pinion drive with built-in cushions ensure smooth operation with optimum cycle times. The table clamp and unclamp functions are hydraulic and monitored for safety by feedback switches.

Leader's managing director, Mark Jones, says: "Exact is a professional global supplier

built on a robust technological research and development foundation, complemented by a quality minded workforce using state-of-the-art manufacturing equipment and a stringent quality control system. Like Leader, the company is committed to finding a solution that achieves or exceeds customer satisfaction."

Exact's quality CNC tables are used in a wide variety of applications in the medical, aerospace and motorsports industries, in the manufacturing of oil and water pipeline valves and equipment and in job shops where flexibility is required. They are also used in the automotive, heavy goods and passenger transit industries, that demand critical tolerances with repeatability and reliability. Here, the cost-per-part is driven down by global competition, and these companies are looking to specialists such as Exact to provide increases in efficiency and productivity, giving them the edge by implementing process improvements.

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



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Gewefa expands programme of face and taper toolholders by 50 percent

Corsham-based toolholding specialist Gewefa UK has further expanded its programme of standard face and taper toolholders by 50 percent following the addition of a range of extended length holders that greatly increase the areas of application.

The Gewefa family of face and taper toolholders is among the most extensive available and now covers BT and DIN formats in SK30, 40 and 50 tapers to offer comprehensive application capability. The new length variants cover all formats including collet chucks, shell mills, face mills, shrink clamp and hydraulic chucks in standard or adaptor formats.

With face and taper, the crucial face and taper contact surfaces are precision ground to produce an exceptionally rigid tool/spindle surface contact while also optimising the clamping properties.

This creates conditions for improved cutter life, better maintained accuracy and cutting capability, all features that impact

positively on high speed and heavy-duty machining processes.

Gewefa has a long history as a manufacturer of face and taper tooling and as long ago as the mid 1970's it was manufacturing toolholders in this format for machines using Waldrich Coburg, Werner and Pfliederer and Ingersoll spindles.

Subsequently it developed its own comprehensive range which is completely interchangeable with other proprietary systems.

As Gewefa UK managing director Keith Warner explains: "Being an independent supplier, our toolholders are fully interchangeable with other systems giving the user the widest range of applications.

"In the overall scenario of toolholding, face and taper is increasingly popular in heavy duty and high speed applications. The enhanced surface contact with the chuck has direct knock on advantages in precision, rigidity and maintaining accuracy.

The new additions are listed in a



downloadable catalogue via the Gewefa UK website.

Gewefa UK Ltd was established in 1990 and has rapidly established itself as a leading independent supplier of toolholding and allied equipment. Based in Corsham, Wiltshire, Gewefa UK is a subsidiary of Gewefa GmbH.

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The strong one

System 3R's Delphin Zero Point is a proven, high-productivity clamping system ideal for heavy duty milling operations.

The system helps component manufacturers increase productivity levels by streamlining setups and reducing machine idle time. It is optimised to handle any type of machine tool, including those with T-Slot or grid pattern tables as well as machines with pallet changers.

Its design features flexible references to allow quick implementation of existing fixtures and pallets, which provides obvious economic and productivity advantages. It provides a clamping force of 60,000 N per chuck face with an accuracy of five microns.

Every production plant uses clamping elements, jigs, fixtures, reference pallet systems to be able to clamp the range of workpieces machined efficiently and economically. The Delphin modular zero-point clamping system allows the machine table to be equipped individually with position-determining chucks.

It thus allows the complete work area to

be used and offers substantial advantages in relation to reducing setting times and enhanced flexibility thanks to substitution of preset workpieces.

Consequently, it opens up entirely new options for manual and automated workpiece change. Machine runtimes are maximised by a reduction in setting times by up to 90 percent. The modernisation of existing machines is possible by retrofitting with Delphin.

Depending on the Delphin system, activation is either pneumatic or hydraulic. The control signals can be sent from the machine or from the robot to the corresponding machine valves which then perform activation of the Delphin system. There is also the option of activating a Delphin hydraulic unit directly by control air. On the Delphin BIG system, the control signals can be routed directly to the hydraulic unit. In this case, no valves are required on the machine for controlling the Delphin BIG chucks.



One major advantage of using hydraulic systems instead of pneumatic systems is controlled lowering of the workpieces during the clamping operation. The workpiece is lowered slowly onto the Z-supports, consequently protecting them. The Z-supports are cleaned during this clamping operation on the HHP/HCP chuck. This increases accuracy over the years and thus prolongs the service life of the Delphin chucks.

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LK Metrology introduces new range of compact CMMs with the latest multi-sensor technology

A range of CMMs has been introduced by British manufacturer LK Metrology offering high accuracy and repeatability in a compact footprint. Built at the company's factory near Derby, the new ALTERAC machines are available in three sizes, 7.7.5, 10.7.5, and 10.7.7, with the respective X,Y,Z axis movements being 700 x 650 x 500 mm, 1,000 x 650 x 500 mm and 1,000 x 650 x 650 mm. Typical applications are likely to be found in the aerospace, automotive, medical and other industries with demanding inspection requirements.

ALTERAC is equally at home in an inspection department or on the shop floor, especially as pneumatic mounts isolate the CMM well from nearby sources of low frequency vibration such as large machinery. The CMM control may be either stand-alone or integrated into the machine base with a keyboard on an arm at the side, giving the customer a choice that best suits the installation site. The latter option also facilitates relocation of the equipment once installed. The inclusion of Renishaw encoders with 0.05 µm resolution optical scales for high volumetric accuracy not only leads to outstanding metrology but also provides immunity to the ingress of contaminants.

Measurements taken with a touch-trigger probe at a series of points, ideal for acquiring information on dimensional accuracy, is increasingly being augmented by continuous-contact probing, analogue scanning and laser scanning to allow high speed collection of data on complex freeform surfaces. ALTERAC measuring machines are able to deploy all three types of sensor. Such flexible data acquisition boosts measurement throughput to avoid bottlenecks in the metrology department, provides a comprehensive awareness of component conformance, and meets today's manufacturers' requirement for a CMM that underpins concurrent engineering practices to speed time to market for new products.

The CMM structure has been optimised using computer aided solid modelling and finite element analysis, particularly within the bridge section and is finely tuned to maximise stiffness, reduce vibration and provide smoothness of axis motion, all of



which are fundamental to delivering high accuracy measurements. Such is LK's confidence in its design methods that it offers an unparalleled 10-year guarantee covering dimensional stability.

All guideways use LK-designed, low maintenance, preloaded air bearings of wrap-around design offering 3.5 times higher stiffness than standard air bearings. They run with a reduced air film thickness for low energy consumption and give repeatable measurement results, even at fast axis speeds. Friction drives provide smooth motion and exact positioning at continuously varying speeds, as well as zero backlash, overload protection and low maintenance costs.

Careful selection of materials in the machine construction includes, as with all LK CMMs, the use of ceramic for the moving bridge and spindle. It is more than three times stiffer than aluminium yet only one-third heavier by volume, resulting in higher machine acceleration and speed. Ceramic does not stress relieve like aluminium, leading to better long-term dimensional stability. The thermal expansion coefficient of ceramic, which is similar to that

of granite but four times lower than aluminium's, makes the structure highly resilient to thermal movement. Moreover, ceramic is three times harder than aluminium, so is more resistant to abrasive wear and indentation.

ALTERAC is available with LK's powerful CAMIO8 DMIS-based, multi-sensor software enabling programming and measurement based on 3D CAD data and comprehensive reporting.

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

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Baty vision system drives premier quality for Formula 1 powertrains

Kadel Engineering Ltd is using a Baty Venture XT 3030 CNC vision system to ensure the accurate manufacture of precision components for Formula 1 cars. Bowers Group supplied the business with the Baty vision system after Kadel Engineering Ltd decided to invest in a more sophisticated optical measurement solution, in order to meet the highest levels of quality, tight tolerances and fast turnaround demanded by Formula 1.

Paul Rollins, managing director at KADEL Engineering Ltd says: "Components are needed at short notice for the build of the F1 cars and are often required to be flown out to a race on the other side of the world. It is imperative that parts conform to the correct tolerances first time, as there is usually no time to remake or rework parts that do not meet those tolerances. Parts are rigorously checked by our customers and our quality and performance closely monitored.

"The Baty Venture XT acts as another inspector and an extra check, so it's near impossible for anything to slip through the net unnoticed. It can be used as an optical measuring machine and a CMM, so the combination effectively gives us two machines in one, which is just what we needed for the parts we manufacture. We felt that it would not only give our customers more confidence in our ability, it also enables us to take on more complex parts now we have the equipment to measure them. It's also very easy to use and the software is very user friendly. There's the added advantage that it's very small and compact and doesn't take up much room."

Located in Keighley, West Yorkshire, Kadel Engineering Ltd offers high quality milling and turning and has the capacity to manufacture both small and large batches of precision components in any material. Components produced include precision parts which make up the powertrains of Formula 1 cars.

Kadel Engineering Ltd has recently invested in a large quantity of machinery to improve its manufacturing processes and therefore wished to complete the loop by investing in measurement equipment in order to inspect the components made. As



regular producers of precision parts for Formula 1 cars, the business has to ensure that manufactured parts meet the very highest levels of quality. Parts must always meet very tight tolerances, typically within 0.010 mm, are often required in small batches, and with a constant flow of new parts required. Quality is of the upmost importance, as parts for the rapid Formula 1 business have an exceptionally fast turn-around and must be 100 percent correct.

After struggling to measure some key component features accurately and confidently, Kadel Engineering Ltd invested in the Baty Venture XT 3030 CNC vision system which can be used for both contact and non-contact measurement and includes advanced features for scanning and best fitting. It is also perfect for use as a visual inspection aid because it has a powerful zoom lens and good surface illumination.

The Baty Venture allows the business to measure features that were previously difficult to measure accurately. The non-contact scan facility has also enabled

operators to check very thin, delicate components. As there is no longer any need to handle the parts during measurement, the risk of distorting the part during the inspection process has been eliminated.

The Baty Venture XT is a bench top CMM machine, and therefore ideal for measuring small parts. Machine operators are able to inspect the components they make as they go along, before further verification by senior staff members. Kadel Engineering Ltd also uses the Baty Venture XT to easily measure geometric tolerances such as roundness and flatness, which were previously difficult and time consuming.

Paul Rollins concludes: "We are really happy with the service we received from Bowers Group. The delivery was very quick and efficiently handled and the training was very thorough too."

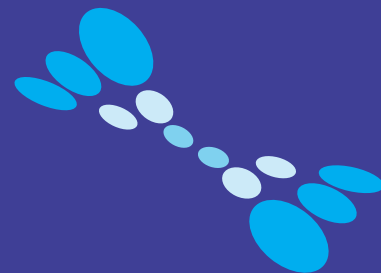
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Mitutoyo supplies 'vision of quality' to Fluorocarbon

Hertford-based Fluorocarbon Company Ltd is one of the UK's largest fluoropolymer processor companies. Since its inception in 1962, Fluorocarbon has grown to become a global supplier of PTFE and polymer related components and engineering plastics in stock shapes. The business also specialises in the precision machining of high-performance materials including, PTFE, PCTFE, PEEK, PFA, FEP nylons, plastics and ferrous and non-ferrous metals.

Operating from three manufacturing sites, two in the UK and one in Europe, Fluorocarbon serves a wide range of demanding industries, including the aerospace, oil and gas, chemical processing, medical, pharmaceutical, semi-conductor and telecommunications sectors.

For some time, Fluorocarbon's Hertford manufacturing facility has been engaged in the production of complex PTFE components for a prestigious global customer. These components have 50 slots along their length. In addition to the accuracy of the size and pitch of the slots being crucial to the parts' performance, every slot has four difficult to access, critical features, each with tolerances measured in microns applied to them. In the past, even though the components' methodical inspection routines were time consuming, the relatively low numbers being produced meant that Fluorocarbon's quality department was able to keep-pace with production.

Although, the situation changed dramatically when the demand for the components recently rocketed. As the vastly increased volume of components being produced was beginning to place a strain on

Fluorocarbon's inspection capacity, a search was made for a suitably precise, fast-acting, automated measuring system. After considering several alternative, high-tech options, an advanced Quick Vision Active, CNC vision measuring system was purchased from Mitutoyo UK.

Now installed and fully operational, thanks to its rapid CNC operating system, rather than tie-up a skilled operators' time in performing the slow, repetitive task of carefully inspecting each individual component, Fluorocarbon's new Mitutoyo vision measuring system is now accurately inspecting the previously difficult to measure components in a rapid, fully-automated way.

The company's quality staff now simply load a batch of five components onto a fixture located on the Quick Vision Active's stage, recall the components' inspection program and start a fully automated inspection routine. At the end of each measuring sequence, five fully detailed component inspection reports are generated, then a new batch of components is loaded onto the machine.

The remarkable speed of the company's new Mitutoyo vision measuring system means that each component can now be fully inspected in just two minutes when previously the same task more than 15 minutes. In addition, the impressive accuracy and repeatability specification of the Quick Vision Active has removed the human element from the components inspection process and has ensured that 'right first-time every-time' component inspection takes place.

Due to its ability to quickly and accurately inspect a wide variety of the company's other components, the Quick Vision Active has assisted in increasing the overall efficiency of Fluorocarbon's quality department.

Stephen Dixon, business line leader for engineering at Fluorocarbon Company, explains "As well as being BS.EN.ISO. 9001:2015 and AS9100D approved, Fluorocarbon has a long list of additional approvals.



We have earned a global reputation for our proficiency in machining complex components from challenging materials and also for our ability to supply consistently high-quality components.

"In order to solve our inspection capacity problem, related to our global customer's complex components, we considered solutions from several leading metrology companies. Although, following an in-depth practical demonstration, we found that Mitutoyo's Quick Vision Active was the ideal CNC vision measuring system for our demanding needs.

"In addition to being easy to program and use, as it is a non-contact vision related system, it is ideal for measuring parts that would deform under contact. Also, the Quick Vision Active provides the levels of accuracy that we require and the speed that allows it to make light work of the high volumes of the complex components now passing through our quality department."

Mitutoyo's Quick Vision Active combines the flexibility of a high-quality zoom lens with the speed of a state-of-the-art digital colour camera. The ultra-efficient Quick Vision Active benefits from CNC control, enabling high-speed, high-accuracy automated measuring routines to be performed.

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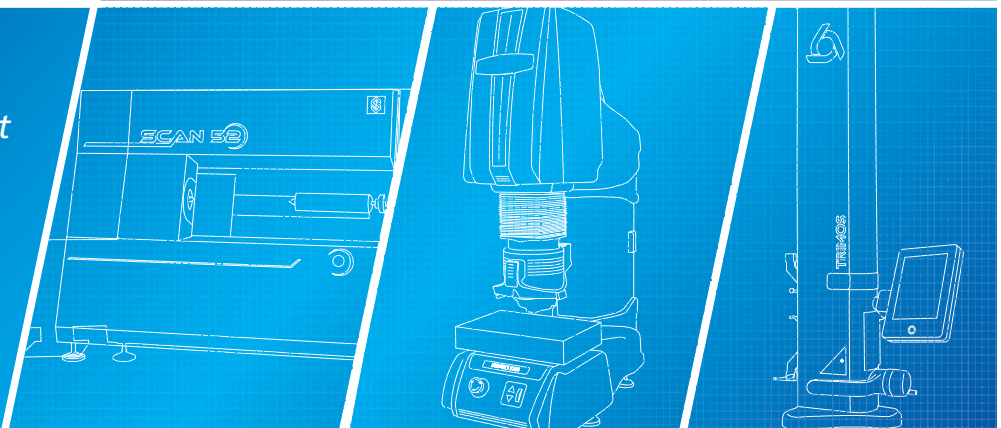
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Fablink makes Quantum leap with FARO

The UK-based Fablink Group is a privately-owned company specialising in the manufacture of cabs, pressings and assemblies to a number of global OEMs. Having commenced trading with just two employees in 2005, the company's impressive growth over the last 15 years, achieved both generically and through acquisition, means that Fablink's headcount has grown to over 700 people spread over five sites.

As a Tier 1 supplier, Fablink has built a strong reputation in delivering comprehensive design and manufacturing solutions to some of the world's largest OEMs within the automotive, truck, off-highway, power generation and material handling industries.

Based in Brixworth, Northamptonshire, Fablink's impressive technical centre provides a state-of-the-art provision to support customers' requirements related to design, prototype tooling and product development activities.

To help Fablink's inspection work keep pace with rising production levels and to improve the company's measurement capabilities, it researched into market leading measuring tools that had both tactile probing and scanning capabilities as well as having the generous measuring capacities to cover the large assemblies that Fablink manufacture. After witnessing several demonstrations, an order was placed with FARO UK for an advanced, 3 m measurement range FARO QuantumM FaroArm, fitted with a FAROBlu Laser Line Probe SD.

Glenn Wright, head of quality at Fablink, explains: "As we serve a range of challenging industries where consistent quality and competitive pricing are of paramount importance, it is vital that we remain at the cutting-edge of the technologies that support our quality ethos and our continuing pursuit of efficiency improvements. This is especially true when supplying the demanding automotive sector, where expectations of enhanced accuracy and increased efficiencies are a given.

"It was these factors and an increased workload that recently prompted our search for a hi-tech, large capacity technology that would boost our inspection competencies and further improve our efficiency levels.



After seeing three scanning systems from leading metrology companies perform demonstrations, we came to the conclusion that the FARO Quantum ScanArm was both the easiest and fastest system to use. We were very impressed with its accuracy, repeatability and the standard of the useable real time data it provided, alongside its ability to reduce our previous scanning times by up to 75 percent.

"As we received excellent training from the staff of FARO UK, our operators were soon able to undertake basic inspection routines. Then, as the FARO operating system is logical and easy to understand, our staff were soon able to undertake more complex measuring tasks.

Glenn Wright continues: "Although intended for use mainly at our Brixworth site, as the FARO solution is portable and quick to set up, it is available for use at our other sites. The Quantum has also proved invaluable for the regular inspection and calibration of our jigs and fixtures."

Ideal for companies that want to maximise manufacturing productivity, reduce scrap and waste levels and improve their production and quality control efficiencies, when launched, the Quantum FaroArm achieved an industry first by becoming the first Portable Coordinate Measuring Machine (PCMM) to meet the most rigorous ISO 10360-12:2016 standards.

Equally at home in a quality control department or on the shop-floor, the robust Quantum ScanArm is designed to deliver market-leading reliability and precision even in harsh environments. The lightweight and portable nature of the Quantum ScanArm enables it to be easily transported and set up quickly within remote areas. Dual hot-swappable batteries and its wireless operation for scanning also help to provide unmatched reach across the manufacturing floor.

The Quantum ScanArm enables plug-and-play 3D laser scanning integration with FAROBlu™ technology. The optically-superior blue laser technology has a shorter wavelength than a red laser and delivers improved scanning results with a higher resolution. The use of an extra wide scan stripe and fast frame rate boosts productivity by increasing coverage and reducing scanning time. FAROBlu technology makes it possible to seamlessly scan across diverse surface materials regardless of contrast, reflectivity or part complexity without any special coatings or target placement.

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New technology an eye-opener for Open House visitors

Some of the UK's most renowned engineers and manufacturers descended on Derbyshire to get a glimpse of new technologies expected to take the metrology field by storm.

Live demonstrations, hands-on challenges and multi-sensor measurement systems never before seen on these shores were the highlights of OGP UK's 2019 Open House, attracting dozens of visitors through the doors of its Innovation Centre in Foston.

The FlexPoint, the only Coordinate Measurement Machine (CMM) featuring multiple high-accuracy sensors in a VersaFlex cluster head, proved a major draw, as did the advanced Fusion 350 system and ShapeGrabber Ai620, a metrology-class 3D scanner capable of rapidly assessing complex surfaces with a high density of data points.

The Open House was followed by a two-day technical partner meeting, hosted by OGP UK for the first time and bringing together 26 representatives from 15 channel partners of parent company Quality Vision International (QVI), from all over Europe.



For most, it was their very first chance to see both the new technology and machines from across the OGP range including SNAP, Vantage and CNC models as well as to hear about developments in ZONE3 multi-sensor metrology software and to share valuable knowledge.

Tad Davis, vice president of operations in Europe at OGP Inc, flew in especially from the US for the open house and technical partner meeting.

He comments: "This really positive, successful event was particularly special because we were introducing newly released products in the FlexPoint and ShapeGrabber.

"We had great equipment, as well as great hospitality and facilities to be able to demonstrate all of our technologies. We couldn't have asked for a better venue, participation or more positive outcomes.

"The Open House gave visitors the chance to see brand new equipment and it was eye-opening for them to know that there are other technologies we offer that they may not have known about before."

OGP UK sales manager Graham Shaw adds: "With the most diverse range of machines that we've ever had onsite, our showroom looked stunning throughout the week and there was a real buzz about the place.

"Those who came along were given a unique insight into the many advancements in multi-sensor metrology technology."

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Parker Bioscience chooses IndySoft

Employing approximately 58,000 people globally, Parker Hannifin is a leader in motion and control technology. The company's products and services cover areas including, aerospace, climate control, electromechanical, fluid and gas handling, hydraulics, pneumatics, process control and filtration.

With lead operations located in Oxnard, California and Birtley, UK, Parker Bioscience Engineering and Filtration has over 50 years of experience in the provision of high-quality filtration products and services for applications within the life sciences, food and beverage, industrial processing and microelectronics markets.

The Parker Bioscience Filtration Birtley facility has recently undergone a multi-million-pound development programme. This considerable investment has resulted in the site becoming one of the world's most modern manufacturing sites for integrated bioprocessing solutions.

Essential to the efficient operation of the Birtley facility is the work of the company's Instrument Service Group. The group provide support by maintaining, testing and calibrating a wide range of customer equipment, including filter integrity testing machines.

Prompted by Parker Hannifin's philosophy of pursuing constant improvements, Andrew Harker of the Instrument Service Group recently searched for an effective asset management software solution that would streamline the group's processes,

increase productivity, help in maintaining data integrity and improve logistics. After considering the offerings from several potential providers, the solution was found in IndySoft software.

Andrew Harker explains: "The high-quality filtration systems manufactured by Parker Bioscience Birtley, are sold throughout the world. These systems perform

critical operations by accurately monitoring and validating the performance of our customers' filtration systems.

"The paper based system we were using to oversee the recall, processing, calibration, issuing of relevant certification and the return of our customers filter integrity testing machines, was only capable of handling our previously lower volume of work. As our installed base grew, the resulting increased workload began to show the limitations of the paper system.

"We needed to find a more efficient system that would speed-up our 'housekeeping' and calibration processes.

"I performed an online search for a suitable software system. After reviewing some of the available options and realising that they were not easy to adapt to our particular needs and were also relatively difficult to use, I came across the IndySoft Asset Management software. IndySoft appeared to tick all of our boxes, therefore I requested a demonstration."

Andrew Harker continues: "Given that the use of IndySoft would represent a radical change to the way the Instrument Service Group operated, we organised an in-house demonstration that was performed by the managing director of IndySoft Europe, Jake Bishop. The demonstration was completed in the presence of our Instrument Service Group operatives, our senior IT staff and several other potential company users.

"In addition to Jake Bishop demonstrating the software's logical structure, ease-of-use and speed, he was also able to clearly demonstrate the software's ability to streamline the



operations of the Instrument Service Group. In the course of the demonstration many other advantages were discovered. Having proved that IndySoft was ideal for use by our Instrument Service Group, colleagues from other departments began to explore issues related to their own functions. In the vast majority of cases, he was able to illustrate how IndySoft was able to help in these other areas too.

"As IndySoft is so easy-to-use, the software's installation and the change-over from our previous manual system was trouble free. As a result of IndySoft's in-house training and the software's very logical layout providing simple workflows, we were soon able to make use of the vast majority of the software's applications. Now, on the rare occasion that we come across a problem, we have access to IndySoft Europe's help line that is able to provide instant assistance and support."

For the past 20 years, IndySoft has been changing the way manufacturing businesses and commercial calibration labs have managed their assets. With a focus on calibration, tooling, automation, maintenance and repair, over the past two decades IndySoft has introduced multiple, innovative, new asset management solutions to its software.

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Riftek launches RF627WELD system for robotic weld seam tracking and measurement

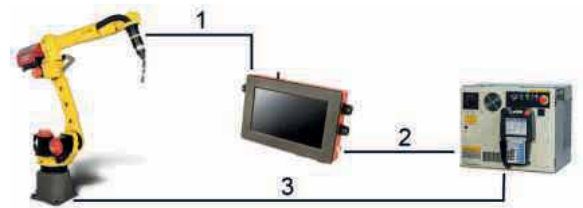
Recently launched by Riftek LLC, the optoelectronic measurement and systems manufacturer, and available with full support from its UK and Ireland distribution partner Ixthus Instrumentation, the new RF627WELD laser seam tracking and measurement system enables precise control of the welding head position in robotic welding systems. The system harnesses the advanced features of Riftek's Lamia application software, a choice of three PΦ627Weld series 2D laser scanners to suit the required measurement area and the RF017 series controller, or alternatively a PC, that interfaces with the customer's welding controller.

With the laser scanner mounted on the customer's welding robot close to the welding torch the scanning area, located directly in front of the welding electrode, is pre-calibrated with a supplied calibration plate. Riftek's Lamia software processes the 2D positional information received from the scanner to determine the exact coordinates of the welding joint which are then transmitted to the robot controller in real

time. In this way the robot controller is able to precisely align the position of the welding torch during the welding process.

Three PΦ627Weld series laser scanners feature Class 2M lasers offering various 2D scanning areas from around 22 x 24 mm to 65 x 180 mm. Linearity through each range is up to +/- 0.1 percent in Z-axis and +/- 0.2% in X-axis. Optional red or blue laser sources allow use with different welded materials and temperature ranges while various operating modes allow working frequency changes for optimal sampling rates. With an IP67 sealed aluminium air or water cooled housing, changeable toughened glass windows and a splash guard included these laser scanners are based on the well proven RF627 range that guarantees durability and offer vibration, shock and temperature ratings that meet the demands for heavy industrial use.

Riftek's multifunctional Lamia software application is designed to be used to



interface its laser scanning range with automated industrial systems to provide recognition, tracking and measurement of geometric parameters or objects in real time. Perfectly suited to welding joint detection, or for surface and dimensional profiling on a wide range of industrial processing tasks, the software interfaces with the client controller to transmit scanning results and data visualisation. Riftek offers a choice of protocols for communication with most common industrial robots.

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Aberlink CMM proves integral to manufacturing developments at Vert Rotors

Operating from a precision technology factory in Edinburgh, award-winning Vert Rotors is a pioneer of the revolutionary Conical Rotary Compressor (CRC) technology.

The innovative CRC technology, the first major innovation in the high pressure compressed air industry for over 40 years, has been integrated into the flagship Vert compressor range. The A100 compressor and the recently unveiled A150, both boast the ability to provide compressed air at market-leading low noise levels from a portable package, while still being capable of continuous operation.

With the ability to achieve higher pressures than existing technologies of the same size, the difference with the CRC technology lies in its ingenious step of rotating inner and outer rotors. As air travels along the rotors the volume of the chamber reduces, which in turn increases the pressure of the air.

It is this powerful and efficient technology that was recognised when the company was awarded the Made in Scotland award (2018) and Innovator of the Year award (2017).

The resulting pressure has a notably low noise signature, which means that Vert compressors are ideal for use in environments where people may be working in close proximity. Vert's primary target application is in laboratories and workshops and other environments where low noise is a distinct advantage. The compressors are a portable, plug and play solution which can quickly and easily be set up wherever air is required.

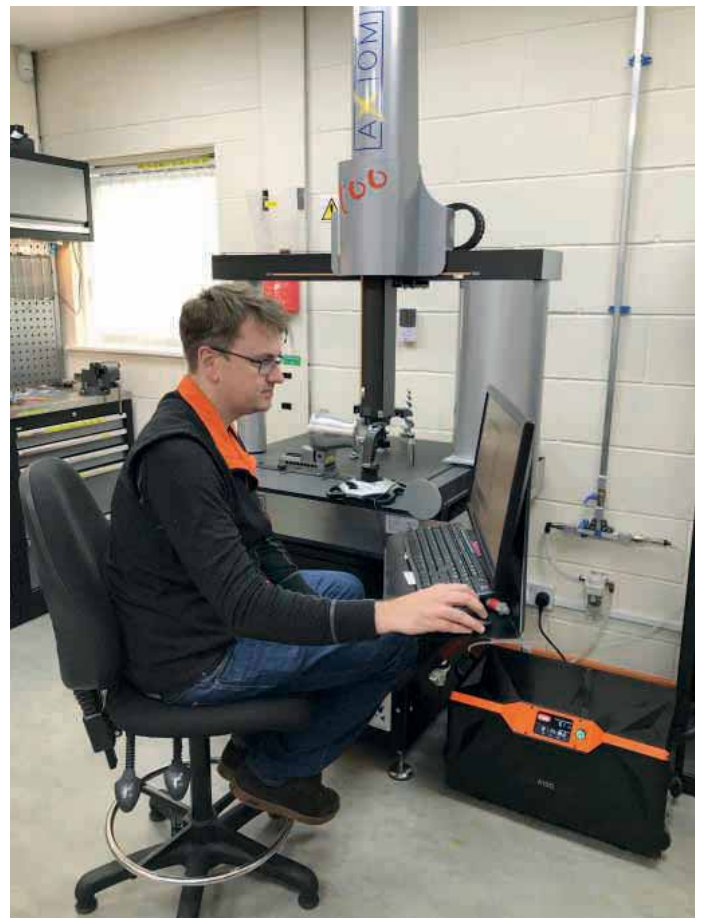
Established in 2013, Vert has experienced rapid growth in the last five years and has benefitted greatly by bringing all its manufacturing processes in-house.

Nicol Low, head of production at Vert, explains: "We have design, engineering, manufacturing, assembly and R&D all in one facility. We are able to produce all the parts we require for our compressors ourselves, without relying on subcon services. This enables us to carry out design iterations far faster than was previously possible. In particular, the inner and outer rotors are difficult to machine to the required tolerance, so we need to quickly evolve the manufacturing strategies to get those correct."

Due to the design and manufacturing complexity of the Vert technology, there was a real need to ensure manufacturing tolerances were as precise as possible. And so, the decision was made to invest in further, more advanced metrology.

Nicol Low continues: "The helical and contoured surfaces of the parts we produce are complex and we needed to ensure that machining accuracy was being achieved and maintained. We looked at all sorts of measuring technologies available, scanning, optical, but our initial search for a CMM was driven by a requirement for accuracy and reliability whilst also keeping an eye on price. As we discovered, Aberlink CMMs could meet all the accuracy requirements and are very price competitive."

Following an initial conversation with Aberlink, Vert sent three rotor parts to the company's Gloucestershire HQ for testing. Two parts were known to be out of tolerance and one that was removed from a performant compressor. It took only 10 minutes on one of Aberlink's advanced Axiom too CMMs to identify the compliant part.



Nicol Low says: "The report data we got back from Aberlink exactly matched the testing we had done ourselves, which was a big thumbs up from us. It was obvious that we could shortcut a lot of the existing manual measurement and lengthy performance testing, save on time and be confident that parts were accurate. It was a pretty easy decision in the end."

Installed in a temperature-controlled Q&A department the Axiom too CMM, since it was purchased by Vert, has been put to good use, providing rapid, accurate feedback on parts for the CRCs. It has also served a dual purpose; the CMM itself is powered by one of the very same A100 compressors that Vert produce, providing an example of how the Vert compressors can be put to use to power machines quietly within a workshop setting.

Nicol Low concludes: "The CMM has proved very reliable and the accuracy of the machine is equally impressive given the price. The Axiom too has been an important machine for our production and has been pretty vital to improve our compressor technology."

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Nuclear AMRC relies on Moore & Wright for critical weld shrinkage measurements

The welding team at the Nuclear AMRC is using a Moore & Wright caliper to accurately measure weld shrinkage on nuclear components. Measurements are carried out as part of Time of Flight Diffraction (TOFD) testing, an advanced non-destructive testing method widely used for weld inspection using ultrasonic probes.

John Crossley M.InstNDT, NDT technology lead at the Nuclear AMRC says: "We use the Moore & Wright IP54 water resistant calipers to measure weld shrinkage simply because they are the best tools for the job. All the shop floor welding team use the caliper on a daily basis when welding; it's perfect for the job, easy to use and provides good accuracy. We also ensure that the accuracy is maintained by carrying out regular in-house calibration to traceable UKAS standards."

Weld shrinkage must be carefully monitored and accurately measured as distortion of the weldment is commonplace during the expansion and contraction of the

weld metal during the welding process. Monitoring weld shrinkage is particularly important because it has a direct effect on residual stress in the weld, which can increase susceptibility to failure through corrosion fatigue, stress corrosion cracking and fracture. Each measurement is logged by the Nuclear AMRC, and parameters for tolerances strictly met in order for the part to be accepted.

The Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC) helps UK manufacturers win work across the nuclear sector. Located on the Advanced Manufacturing Park (AMP) in South Yorkshire, on the border of Sheffield and Rotherham, the centre's manufacturing innovation capabilities and supply chain development services are open to all UK manufacturers, from specialist SMEs to top-tier OEMs.

Ensuring the overall performance of the weld in service is absolutely critical, meaning that the welding team at the Nuclear AMRC



is required to identify any discontinuities in the welding profile, including careful measurement of weld shrinkage. This careful evaluation of the weld will determine acceptance or rejection depending on the required criteria.

John Crossley concludes: "The accurate measurement of weld shrinkage is really important to the work we do at the Nuclear AMRC. We carry out welding work for nuclear, offshore, and oil and gas applications, all of which require the highest levels of quality due to extreme conditions and safety considerations."

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Non-contact technology simplifies torque monitoring and aids efficiency

Monitoring torque in a drive shaft is one of the best ways of assessing the performance of plant and machinery. However, because drive shafts rotate, hard wiring a sensor into place usually requires the use of a delicate slip ring. An alternative solution is to use a non-contact radio frequency detector to monitor 'Surface Acoustic Waves' (SAWs), as Mark Ingham of Sensor Technology Ltd explains.

Torque imparts a small degree of twist into a driven shaft, which will distort SAW devices, small quartz combs, affixed to the shaft. This deformation causes a change in the resonant frequency of the combs, which can be measured via a non-contact Radio Frequency (RF) pick-up mounted close to the shaft. The pick-up emits an RF signal towards the shaft which is reflected back by the combs with its frequency changed in proportion to the distortion of the combs.

Electronic processing and calibration of the returned signal generates a precise, real time indication of the torque being

transmitted by the shaft. A SAW transducer is able to sense torque in both directions and provides fast mechanical and electrical responses. As the method is non-contact, it also offers complete freedom from slip rings, brushes and/or complex electronics, which are often found in traditional torque measurement systems. SAW devices also have a high immunity to magnetic forces allowing their use in, for example, motors where other analogue technologies are very susceptible to electronic interference.

SAW-based torque sensors have been used around the world and in many fields, from test rigs to wind turbines and generators based on tidal or river flows. They are used extensively in the high-tech world of the development of engines and gearboxes for Formula 1. Pharmaceutical companies employ them to monitor the pumps micro-dosing active ingredients into medicines and tablets. Torque feedback systems can be used by security firms to



determine the direction their movable CCTV cameras are facing so that they can efficiently watch premises under their protection.

Today, many are increasingly turning to torque monitoring to generate the vital operating and production data that maintains production and efficiency.

Sensor Technology Ltd
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OPEN MIND presents hyperMILL 2019.2

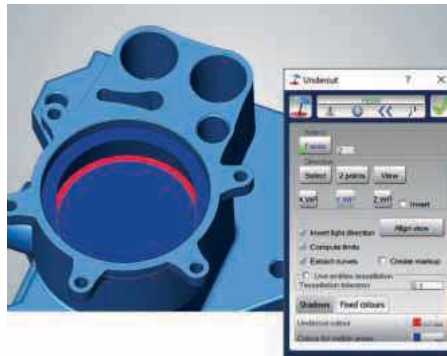
At the Northern Ireland Manufacturing & Supply Chain exhibition at the Titanic Exhibition Centre in Belfast, OPEN MIND Technologies will be demonstrating the latest version of hyperMILL® CAM software. At the end of February, the leading CAM developer will be introducing the latest features to its CAM system that has already won plaudits in the aerospace, medical and general subcontract sectors in Ireland.

hyperMILL 2019.2 has a range of new features including high-precision 3D finishing, 5-axis tangent machining, high-performance turning and new CAD-for-CAM technologies. OPEN MIND is integrating more and more functions that previously required extra CAD machining steps directly into CAM strategies to further speed up programming in Version 2019.2 of hyperMILL.

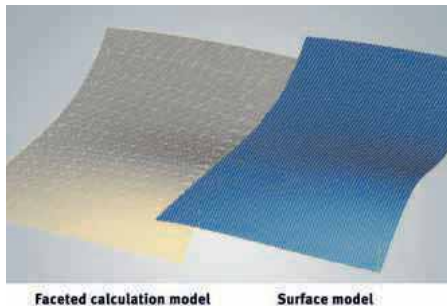
The previous version of hyperMILL already featured high-precision profile finishing. Now, hyperMILL 2019.2 offers a comparable function for 3D shape Z-level finishing. The 'high-precision surface mode' option ensures ultra-smooth surfaces with tolerances in the μm range. This saves time on post-machining finishing processes, particularly when applied to mould making. The 'Smooth overlap' function has the same effect for 3D profile finishing. The transition regions for steep and shallow machining have a small overlap including a slightly lifted cutter, resulting in perfect finishing with an imperceptible transition.

CAD functions directly integrated into CAM

In hyperMILL 2019.2, the hyperCAD®-S function 'Global fitting' is directly integrated into the CAM strategy in 5-axis tangent machining. With this function, multiple faces can be joined into one face with defined ISO orientation. The principle of using CAD



elements for CAM programming is also applied, for example, for automatic face extension. With the automatic face extension, the bounding surfaces are automatically extended during programming to improve the edges of the machined surfaces. This greatly simplifies programming, since these adjustments are made within the CAM strategy, without switching to the CAD environment.



High-performance turning

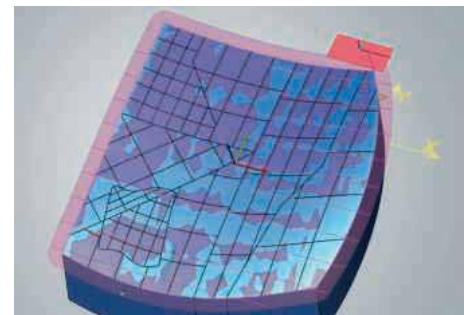
In the last version of hyperMILL MAXX Machining, turn-roughing was implemented with trochoidal toolpaths. Optimised connecting paths and fluent machine movements ensure high-performance machining. This means significantly higher machining values can be driven compared to conventional roughing methods. Version 2019.2 guarantees even greater process reliability for high-performance turning and tool life monitoring makes it possible to restrict the use of a tool by the distance covered, the number of toolpaths, or a time limit. If the defined limit is reached, a retract macro is generated automatically and the job ends.

Improved feature and macro technology

OPEN MIND has also further improved the feature and macro technology in the new version to enable more secure and simpler

programming for users. One function that is generally useful for everyday work is the definition of macros for recurring geometries. OPEN MIND has now added full-text searching to the macro database. Users can also define machine and material groups as defaults to make it easier to select macros.

Hole feature linking means that model changes made to CAD features are automatically transferred to hyperMILL. Since design changes in CAD are associatively linked with the CAM system, users can quickly and securely make updates.



Analytical capabilities

An important aspect of automating CNC programming is analysing the existing design in terms of possible machining strategies.

An interesting new function is available for users who work with very large parts with hyperCAD-S. It enables the workpiece mass and centre of mass to be calculated with a material definition for solid, mesh and stock models. Another highlight of the CAD portion of the suite is the 'Undercut' function, which makes it possible to detect undercut areas on components quickly and reliably. Moreover, the new 'Local curvature' analysis function makes it possible to detect curvature radii on components. The minimum curvature radius, which often plays the biggest role, is output immediately. The user can then determine the best possible lead angles or tool radii for machining curved faces.

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APH3G optimises usage of machines with Tebis CAD/CAM software

APH3G purchased Tebis CAD/CAM software for its production in April 2018. By introducing Tebis to its workshop, the company can now save time and have much greater control over its machines than ever before

Based in Benfleet, Essex, with approximately 30 employees, APH3G was formed in 2006, although its parent company AP Hollings, a vacuum forming manufacturer and fibreglass moulder, was originally founded as a pattern making company by Arthur Pollard Hollings. The company has a history of over 60 years specialising in manufacturing vacuum formed products, fibreglass mouldings, rim mouldings with machining, assembly, prototypes, jigs & fixtures.

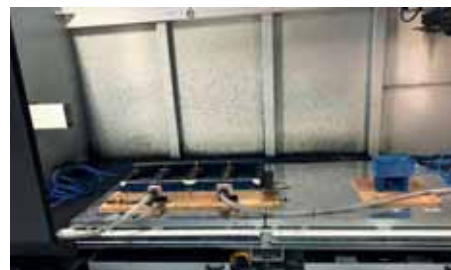
Andy Hollings, director at APH3G, explains why the company chose Tebis: "Upon looking at various companies and the packages they offered, we found Tebis to be very user friendly, with the technical capabilities being perfect for our requirements."

Engineering director Martin Cork adds: "Tebis CAD/CAM software helps us to produce the precision components to tight deadlines while producing high precision parts."

He continues to explain that before they purchased Tebis CAD/CAM, they used to trim all of the components manually and it was taking too much time for them. The company decided that it was the right time to invest and automate its CAD/CAM processes. APH3G first bought a trim license in April 2018. A few months later, they added another module for pattern machining. Around the middle of 2019, APH3G purchased the second Tebis license for pattern machining.

APH3G has witnessed the improvements and benefits from using Tebis. Martin Cork states: "The software allows us to save time in the production. Also, Tebis has a great Virtual Machining technology. We have much greater control over our machines than ever before. We are able to see the collision before it happens and we finally have the full control and access over the whole production process.

"What I like about Tebis software is that it is quick and easy to use, we are surprised at



how quickly we have picked it up after few days training."

APH3G is now considering future plans for further expansion of its machining operations with Tebis advanced and automated CAD/CAM software. Martin Cork concludes: "We look forward to working more with Tebis in the future."

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VISI helps mouldmaker rise to new challenges

High-end all the way for new-look Alpha Precision

Having revamped its corporate image and website in the last few weeks, an injection mould manufacturer welcomes new challenges and is pushing ahead with important medical, aerospace and automotive contracts.

Alpha Precision say it pushes the boundaries of what's possible in precision engineering, through state-of-the-art software. In particular, this helped the company to navigate the recession in its native Irish Republic by giving it a competitive edge to work in high-end markets.

Alpha Precision, based at Tubbercurry in County Sligo, operates an almost full suite of VISI modules, which director Brendan Feely describes as a seamless communication tool: "Several years ago Ireland experienced an exodus of toolmaking contracts as work went overseas, particularly to China. At the same time, the specialist VISI CAD/CAM software for the mould and die industry was rapidly developing and adding new features. Even companies which weren't computer literate were investing in the technology to survive. The software had a huge effect on the toolmaking industry, giving us a competitive advantage to weather the storm."

He says it's now "high-end all the way" for Alpha Precision; high-end staff building high-end mould tools with high-end software: "The technology promotes a more automated process and means our staff



need a different skillset nowadays to use VISI to its full potential."

Brendan Freely describes VISI as the glue in the complete toolmaking environment: "We have a variety of different machines doing different jobs, so our operators have different skills. The software's applied on the back of the machining and because there are several disciplines, such as design, milling, wire and spark eroding, the software fits naturally into its given area. The operator in that area is just trained on the one particular VISI module."

He compares the toolroom to a group of people from different countries, with none of them speaking a language other than their own: "One language is design; others

include flow analysis, milling, wire eroding and spark erosion. VISI is the common language that unites all those processes, ensuring everything moves fluently through the toolroom from one discipline to another."

Operating with 16 employees, the company produces an average of around 40 tools a year, ranging in size from 100 mm x 100 mm x 100 mm, up to 600 mm x 1 m, mainly for the automotive, medical, packaging and electronics industry sectors.

Partnering with its clients from the initial concept, right through to the final production, he says the experienced design team utilises VISI to design complex moulds, such as a number of high cavitation tools for one of its many medical customers and two-shot plastic injection tools, which involves an overmould. Brendan Freely states: "Although two-shot production adds another element by involving a second material and process, VISI keeps it simple and efficient."

With VISI programs running high-speed milling on Röder, and F3 and F5 Makino machining centres, the challenges posed by the medical industry requiring very fine micro levels, are readily overcome.

Brendan Freely explains: "We use high-end 42,000 rpm spindle speed for very small detail finishing, and cut our electrodes on the Makino F3, with high definition being done on the F5. We can also machine a cavity in just one night, that would otherwise take a week. Using VISI Machining we can



quickly produce a highly polished medical part with fine detail, a milled finish, and a split line within micron accuracy."

VISI Electrode & Wire also powers Alpha Precision's EDM machines for spark eroding and Mitsubishi wire erosion. He says parts of the tool will have been cut on each of the machines and when it's ready for shipping it is a very fine-micron, accurately controlled finished tool for, typically, the medical or automotive industry.

Having invested in many VISI modules including Modelling, Analysis, Flow, Mould, Progress, the wire cutting and electrode systems, along with 2D Milling, 3D Milling

and High Speed Milling, the software is used at every stage of the process, beginning with providing an accurate quotation for the customer.

Brendan Freely continues: "We use VISI's analytical tools to check the drafts and all the different features we'll need to build into the mould, such as the core and side pieces.

"When the order's been placed, we work closely with our customer's moulders on the design concept, including flow analysis and tool layout. Once the 2D design is broken down and we have the tooling in full 3D we really begin to see the huge power of VISI,

which controls everything from design, through milling to wiring in one environment. As we're not going across translators, there's a perfect understanding within the technology, taking it right through every stage."

VISI ensures that all milling for hard prepping and high-speed finishing is handled quickly and

accurately, which he says is vital to the operation: "We make a lot of one-off custom components for each mould, meaning we only run a program once. As pattern cutters we need to be very good at generating CNC code time after time and VISI is exceptional at doing that job for us."

Although injection mould tools form Alpha Precision's core business, it also provides a blow moulding and forming tool service and has experience in specialised press tooling.

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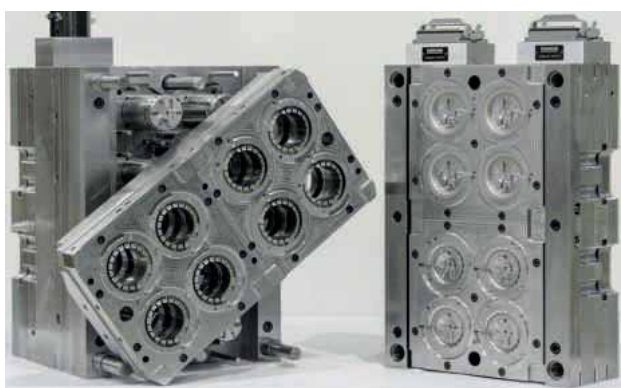
Its technologies are shaping urban and production ecosystems to become increasingly connected and autonomous, ensuring a scalable, sustainable future.

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Simultaneous multi-axis additive technology

InssTek Inc. has integrated the ModuleWorks additive manufacturing calculation core into its DMT® (Direct Metal Tooling) technology. The innovative ModuleWorks software enables InssTek to use the multi-axis traversing capabilities of its DMT machines to provide a fully automated, cost-effective solution for simultaneous 5-axis additive manufacturing and repairing of complex parts.

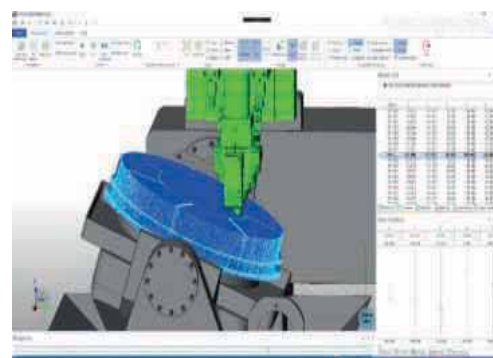
Delivered as a Rhino plugin, DMT with the integrated ModuleWorks calculation core automatically generates a toolpath that uses the 5-axis motion capabilities of the machine to enable the production of parts with highly complex geometries. This means that these parts, can be manufactured in a single, continuous production step. The additive toolpaths are collision-free and can be optimised via user-defined parameters to reduce residual stresses in the material.

For optimal process safety, the integrated ModuleWorks simulation software checks for potential collisions between the component and print head. Printing errors can also be predicted and prevented.

Custom tool profiles provide application flexibility and the simulation generates an in-process model of material flow that can be used for subsequent processing steps.

The integrated high-performance ModuleWorks Post-Processor Framework (PPF) ensures that all the switching and laser commands are optimally adapted for the respective machine and streamed to the controller at a rate of over 50,000 path points/s without the need for further editing to provide a fully automated, cost-effective direct energy deposition solution.

ModuleWorks is a leading software component provider for the CAD/CAM industry. With over 170 employees and 800 man years of software development, ModuleWorks' expertise in toolpath creation and simulation is recognised throughout the industry. Its software components are already optimising the performance and quality of over 500,000 installed seats of CAD/CAM software around the world. From standard products to



exclusive development projects, it works in close cooperation with customers to bring their own vision of Industry 4.0 to life. Its comprehensive product portfolio and cutting-edge software components enables users to optimise their CAD/CAM solutions and connect to CNC/MTB systems to increase competitiveness.

ModuleWorks GmbH

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Status board display system provides real time control of production

Jota Advanced Engineering, the subcontract precision engineering division of the Jota Group, has found that investment in the PSL Datatrack Status Board display system has brought a new dimension to its successful business by giving visual real-time information on its key production functions.

Providing CNC machining capabilities into the wider motor racing, aviation, power generation, scientific and medical sectors, as well as internally to the Jota Sport motor racing and Jota Aviation divisions, the high precision subcontract engineering company uses highly sophisticated production machinery including multi-axis turning centres with live tooling and 5-axis machining centres, to work to very tight tolerances, often in difficult to machine materials. Jota Advanced Engineering is proud of having achieved ISO:9001 accreditation and is seeking IATF 16949 Automotive accreditation.

After being introduced to the system by a

fellow subcontractor at MACH and following a subsequent onsite demonstration, the company initially invested in PSL Datatrack production control software in 2016. This replaced the manual systems which were being used to control production and record business data. Based on Excel spreadsheets and Word documents, this approach was both time-consuming and difficult to manage efficiently. The company realised that a slicker, more professional method of production control and administration was required for the business, to manage everything from product prototyping to batch production.

PSL Datatrack provided the ideal solution as director, Ryan Goodger, explains: "The focus of PSL Datatrack as a company and through its software, is right on the precision engineering sector, a business it knows very well and the needs of companies like Jota Advanced Engineering. The system is very flexible with its modularity but most

important for us was that PSL Datatrack could tailor the software specifically for our requirements."

The investment gave Jota control of its customer quotations, sales and purchase order processing, workshop scheduling, Shop Floor Data Collection (SFDC), deliveries and invoicing procedures. It provided close management of all of these aspects of the business, obviating the need for keeping paperwork or customer archives. It gives Jota highly accurate information about its business and machining capacity so that it can keep its commitment to customers in terms of product quality, traceability and delivery punctuality. Not only that, but quotation times were slashed by up to 40 percent.

Ryan Goodger says: "PSL Datatrack sits behind our precision engineering business. Everything stems from a customer quotation and when an order is then received, the information is transformed into a works order from which all the subsequent



production operations are evolved before delivery and invoicing is then taken care of.”

The next stage for Jota was to be able to see the status of all work passing through the shop floor in real time. This led to investment in Status Boards which has become a key element of the PSL Datatrack system for so many customers because of their versatility. Putting Status Boards on display throughout the factory and, in the management offices at Jota, has ensured that clear visual instructions are available to all departments on any aspect of production, giving even more control over manufacturing processes and achieving Key Performance Indicators (KPIs).

For Ryan Goodger, however, that was just one of the benefits of the multiple Status Boards that were acquired: “I also love the fact that what is displayed on the screens is the result of the customisation that PSL Datatrack undertook to meet our specific requirements and ideas.”

The result of the discussion between Jota and PSL Datatrack was a traffic light system for the Status Boards on the shop floor that can be clearly read and easily understood by all operatives, allowing them to identify any

possible bottlenecks in production and rectify these. The screens show the sequence of jobs that are going through the factory at any time and those that are planned for the following day. A green light indicates when a specific machine is going into production mode and an amber light shows that a machine has been set, ready to go into production. The red-light highlights that it is yet to be set for production.

Meanwhile, four Status Boards in the management offices are used for production planning. They use information stored in various PSL Datatrack modules to display critical information on machine capacities or free hours, alert management as to which jobs may be falling behind schedule, to highlight jobs going out of the door and to show materials coming in or overdue from suppliers.

“This real time information allows us to make important decisions on moving production around, to keep customers fully informed and to monitor or chase suppliers’ deliveries if late,” says Ryan Goodger.

The benefits to Jota from investment in the Status Boards have been immense, ensuring any urgent actions for either the

shop floor or company management are not missed. As information is dynamically kept up-to-date, any instructions relating to specific customer jobs can be immediately generated.

Ryan Goodger concludes: “Status Boards display the information that we want to know and have been customised by PSL Datatrack to suit our needs. Our relationship with Geoff Gartland and his team is enabling Jota Advanced Engineering to go from strength to strength.”

Prospec Systems Ltd is the author and supplier of PSL Datatrack production control software. The company was established in 1988 and its friendly, experienced team has supplied solutions to manufacturing businesses for over 30 years. Its offices are based in Bracknell, Berkshire. Its background skills in Information Technology, engineering, accounting and business management enable it to provide economic and effective software solutions.

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3D printed parts help get the wheels in motion

Wheelchairs are a wonderful brainchild, though no one is quite sure when it was first invented. The first one on record was made for Phillip II of Spain towards the end of the 1500s. Since then, incremental developments have been made but the basic design, except for specialised sports wheelchairs, remains the same. Other than motorised wheelchairs, which were introduced commercially after World War II to assist injured veterans to provide independence.

There remains a fundamental flaw in each of the self-powered and electric-powered wheelchair designs. For self-powered wheelchairs, if the person is not able to turn the large wheel manually, then another person would have to push it. The e-powered version would give them back their independence, however, for a paraplegic or someone suffering from Motor Neurone Disease, other than using mind control a technology which is still in its infancy, the fiddly joystick could prove inaccessible.

This is where Stephen Marshall steps in. He is a senior rehabilitation engineer working in the NHS that assesses patients with non-standard or bespoke requirements. For a wheelchair, this involves assessment, prescription and modification of wheelchair both self-powered and motorise. He mainly sees people with restricted movement, from a paraplegic, who is considered as an active user, to a person suffering from Motor Neurone Disease.

For people who struggle to hold a Joystick, Stephen Marshall will commonly use a golf ball drilled out to fit the joystick shaft. When this has been too small, a tennis ball is used. “This is generally too big for grabbing,” he explains. “In the past, we have drilled a hole in a billiard ball. With the advent of new joysticks, the push forces have been reduced and the joystick’s ability to centre itself with such a weight has been challenged to such a point the chair continues driving once released. This, for many reasons, is not ideal.”



One of the benefits to using 3D printed joystick modifications is the huge weight reduction, especially when a billiard ball-size piece is required. An additional benefit has been the ability to create a tactile finish on the parts, which provides a softer feel.

“We hope to develop this area in the future, using different profiles and sizes to improve people’s lives,” concludes Stephen Marshall.

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A closer look at the RenAM 500Q

Traditional barriers to Additive Manufacturing (AM) were production speed and variation in build quality between machines. However, new multi-laser systems are changing the status quo. Here Rebecca Underwood, product marketing specialist at global engineering technologies company Renishaw, gives you a closer look into Renishaw's RenAM 500Q machine, to provide insight into the cutting edge of metal AM.

If we are to broaden the applications of metal AM so the technology can realise its full potential, it's important that we speed up the AM process while also creating high quality products in a cost-effective way. Doing so will mean that an ever-wider group of users turn to AM technology.

Global spending on AM was forecasted to reach \$26.7 billion in 2019. While many different industries are using AM specialist parts, such as fasteners for aircraft, medical implants and tooling, its applications have been more limited when it comes to more common place products. For example, aircraft seats could be produced using AM as a strong and lightweight alternative to traditional manufacturing or in automotive applications where lightweight components can have an impact on overall efficiency, particularly with the emergence of hybrid and electric vehicles. However, AM is not cost-effective if productivity is low. So, to combat this, Renishaw's latest platform, the RenAM 500Q, is breaking the mould by reducing waste and powder handling and employing multiple lasers to build faster and reduce the cost per part.

Slow build rates have historically been a drawback for AM technology. Traditional metal AM systems have, up until recently, only been capable of laying down material at a speed of around 20 cubic centimetres, 1.2 cubic inch, per hour. If you are producing multiple parts, it's important to reduce time and cost so that the process is efficient and cost-effective.

To achieve this, Renishaw developed the RenAM 500Q, which is fitted with four high power 500 W lasers. Not only can these access the whole powder bed surface simultaneously, but they also achieve build rates of up to four times faster than conventional single laser systems. Maximum efficiency is achieved on the RenAM 500Q as the lasers can work across the entire build plate, ensuring maximum laser efficiency and also allowing the laser interaction to be managed effectively to ensure quality is unaffected by multi-laser interaction when processing.

Quality has been another barrier to the adoption of AM technology, particularly for structural parts in regulated industries such as aeronautics, consumer products and healthcare. During the laser powder bed fusion process, powder spatter and process emissions can be a major cause of defects in end-products and can undermine product quality if impurities fall back into the metal powder. Therefore, one of the keys to high quality AM products is the removal of these impurities.

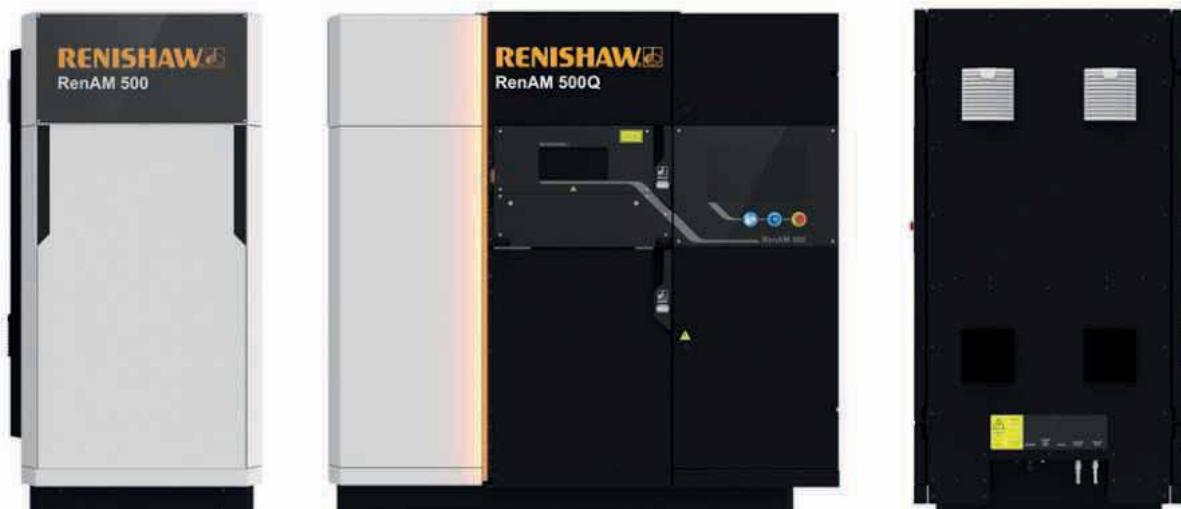
Renishaw has fitted the RenAM 500Q with an intelligent gas flow system that removes process emissions from the build volume,

resulting in processing conditions that provide a stable processing environment that has measurably driven up quality standards to new levels, not previously achieved with metal AM technologies. This means that the final parts exhibit consistent properties; they are high in density, have high tensile strength with excellent ductility and fatigue performance. This creates an end-product that's both strong and light at the same time. Therefore, the machine can be applied to all sorts of applications, ranging from racing cars to dentistry.

For example, mountain bike brand Atherton Bikes uses the RenAM 500Q to produce titanium lugs for its bike frames. The frames themselves are built using carbon fibre tubing, joined together using the AM titanium lugs. Opting for a high productivity machine has made it quicker for the Athertons to design and manufacture race-winning bikes and build a solid business case that would not have been possible only a few years ago.

The RenAM 500Q has also been used by precision industrial manufacturing company Knust-Godwin to handle serial production for down-the-hole oil field instrumentation. As a company that produces large, complex parts for extreme environments where downtime costs millions of dollars, AM technology provides high quality and rapid response times.

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AM Path Optimizer technology integrated in NX for additive manufacturing

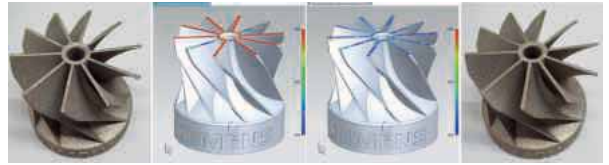
Siemens Digital Industries Software has announced Additive Manufacturing (AM) Path Optimizer, a beta technology integrated in NX™ software, to help customers solve overheating challenges, help reduce scrap and increase production yield to achieve the industrialisation of AM, or the use of AM at the industrial scale. Siemens has developed this next generation advanced simulation technology to help maximise the production yield and quality of powder bed fusion manufactured parts. This latest extension of Siemens' end-to-end additive manufacturing solution feeds the digital thread, informing each step of the industrialised AM process.

Building on the Simcenter Additive Manufacturing Process Simulation solution announced in November 2018, AM Path Optimizer complements Siemens' strategy for the digital twin of the manufacturing process and addresses errors originated from suboptimal scan strategies and process parameters. These can lead to systematic failures due to overheating, which can cause scrap and inconsistencies in component quality.

Siemens has had success demonstrating this beta technology with TRUMPF as a partner. "With the AM Path Optimizer, Siemens and TRUMPF can push industrialization of additive technologies further forward," said Jeroen Risse, AM Expert at TRUMPF. "In our demonstrations we saw an improvement of geometrical accuracy, elimination of re-coater errors caused by overheating, as well as a more homogenous surface quality. Also, the scrap rate is expected to be reduced significantly."

The technology uses an innovative approach combining physics-based simulation with machine learning to analyze a full job file in few minutes before execution on the machine. This technology is expected to help achieve "first time right" prints and drastically reduce trial and error. It can also help reduce printing costs and enable the printing of components that are nearly impossible to achieve today.

"AM Path Optimizer is the latest innovation in Siemens' end-to-end additive



manufacturing solutions, and one that we feel will have a great impact on the use of additive manufacturing for powder bed fusion manufactured parts," said Zvi Feuer, senior vice president, Manufacturing Engineering Software of Siemens Digital Industries Software. "The combination of NX for AM and our Simcenter AM technology within the Xcelerator portfolio provides our customers with key capabilities to assist manufacturers in designing and printing useful parts at scale, which is unmatched in the market."

Siemens is actively engaging early adopters to further prove out the AM Path Optimizer solution. For more information about producing quality parts with industrial additive manufacturing software, please visit: www.siemens.com/plm/additivemanufacturing

Integrating process data into Additive Manufacturing

SCANLAB scanner control technology utilises external sensors

At formnext 2019, high-quality laser scan solution manufacturer SCANLAB GmbH unveiled a scan system control extension using a smart data-acquisition interface that reads diverse sensors. This underscores the company's process sensor expertise. Additive Manufacturing users will gain significant advantages from the ability to uniformly query and evaluate centralised process data.

Industrial manufacturing's requirements are rising relentlessly. An increasingly vital criterion for quality control and product traceability is the precise acquisition and monitoring of measurement data during production processes. However, users often face daunting challenges from the differing data formats, countless interfaces and inadequate real-time synchronisation. For 3D printing, SCANLAB is presenting the 'Open Interface Extension' at formnext 2019. This functional model of an intelligent interface is capable of integrating sensor data into scan system control. Two

tradeshow demonstrators will reveal just how diverse the range of integrable sensors can be.

One configuration incorporates a surface-temperature pyrometer into scan head control. In this setup, a fast-sampling sensor system's data merges with absolutely precise laser beam position data, while all field and objective corrections get taken into account. The laser's power is modulated in parallel with real-time scan motion, too, thus opening up future process control possibilities.

A second application integrates an Optical Coherence Tomography (OCT) sensor from Precitec that measures the surface topography of a powder bed or workpieces. The sensor data's high complexity requires direct interaction with the scan system.

Both companies' years of close collaboration proved invaluable in implementing this project. It lays the foundation for future customer-specific solutions that integrate sensor data with synchronised scanner motion.



With over 35,000 systems produced annually, SCANLAB GmbH is a leading and independent OEM manufacturer of scan solutions for deflecting and positioning laser beams in three dimensions. Its exceptionally fast and precise high-performance galvanometer scanners, scan heads and scan systems find application in industrial materials processing and the electronics, food and beverage industries, as well as biotech and medical technology.

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Kerf installs colossal cutting machine at steel processing plant

Like many small start-ups, P.P. Profiles Ltd was a business conceived in a remarkably small building. In this case, a basement of a cotton mill in Walkden, Greater Manchester. 43 years and the profile and processing company has bought a plasma and flame cutting machine from Kerf Developments that, at 39 m in length, wouldn't fit in most factories, let alone the basement of a cotton mill.

Almost as soon as the business started, it generated immediate success that brought the formation of P.P. Profiles (West Yorkshire) Ltd in 1978, a company that has moved twice down the years before settling in its current 70,000 sq/ft site in Batley. Over the last four decades, the subcontract manufacturer has built a reputation for providing cutting solutions for carbon steel, stainless steel and a range of additional materials in the nuclear, oil and gas, construction, rail, bulk handling, food, water and waste, storage tank and yellow goods industries.

The 40-employee business produces anything from one-offs to small and large batch runs that range from small components to the extremely large. To get a scale of the workload at the heavy engineering business, it is processing an average of 400 to 500 tonnes of steel every month, almost 40 percent of this material is run through the new Kerf RUR4500. It is this reliance on the Kerf Plasma and Flame



cutting machine that justified its acquisition. The level of investment at P.P. Profiles (West Yorkshire) Ltd now stands at more than £2m in the last two years.

Kerf creates efficiency

The reason behind the investment in the colossal Kerf RUR4500 was due to two older 12 m by 2.5 m flame cutting machines and a 6 m plasma machine proving unreliable, creating an inefficient workflow. Commenting upon the acquisition of the Kerf RUR4500 machine, P.P. Profiles (West Yorkshire) Ltd commercial director, Daniel Morley says: "We specified the Kerf RUR4500 with a single high definition 400 A

plasma cutting head on a 12 m by 4 m bed and a two-machine 24 m by 4 m bed that consists of both a 6-head and a 4-head flame cutting gantry, all in a single 39 m by 4 m cell. This allows us to load much larger jobs and it has opened us up to new markets, as parts over 12 m long parts are not uncommon."

The arrival of the Kerf RUR4500 machine made the previous two flame and one plasma machine surplus to requirements, reducing the required floor area and drastically improving efficiency and workflow. Referring to the savings, Daniel Morley says: "Anybody wishing to not only survive but thrive in the UK manufacturing sector must have efficiency at the forefront of their minds and prior to the arrival of the Kerf RUR4500, we had to run a late shift and a night shift. The Kerf machine cell instantly eradicated the need for extra shifts and we now only work a day shift. This is because each of the three previous machines required loading, material processing, unloading the steel sheets that could be up to 12 m long and then cutting the sheet remnants into smaller sized quantities for scrap disposal. This would be very labour intensive and all happening when the machine was not cutting. Our crane operator would be feeding three machines with material instead of just one."

"Now, we have four people running the three machines within the Kerf RUR4500 cell. There are operators running each of the



two flame cutting gantries and another operator on the plasma machine. Feeding the Kerf machine is a crane operator that organises and sorts material flow as well as ensuring the three machines are always loaded with material, he also removes the plate remnants. This workflow configuration has reduced our processing times by at least 50 percent.

"The 50 percent time saving is credit to having the ability to pendulum load and process our workflow. This means we can cut steel plates on the extremely large bed and whilst this process is ongoing, the crane operator can load the next plate. So, as soon as the machine has cut one plate, it can move on to the next. This eliminates non-cutting times and slashes setup times. During cutting times, the crane operator is constantly loading and unloading plates to ensure all three stations are constantly running. As the new Kerf plasma head is running on a 12 m bed compared to the previous 6 m bed, the benefits of pendulum loading, and unloading are particularly pertinent on this station."

The typical lead times at P.P. Profiles (West Yorkshire) Ltd are three to five days.

However, the Kerf installation has eliminated bottlenecks, improved workflow and scheduling and given the company the facility to react much faster to customer demands. On top of this, the ability to service sectors where rush jobs and breakdowns are frequent is crucial to PP Profiles, so having machinery that hinders this is not an option.

Quality installation

Daniel Morley continues: "Machine uptime and service are critical to our business. We bought a Kerf waterjet machine over 10 years ago and the support has been outstanding. We have machines from several suppliers and the service from Kerf is something that any company could learn from. If we ever have an issue, Kerf will get an engineer out straight away and the problem is always resolved in less than 24 hours. What is equally impressive is the customer care, Kerf will regularly call us or pop-in to check everything is running smoothly. It is just excellent service and customer care."

As well as previously experiencing frequent breakdowns, the other reason for

investing in the Kerf machine was quality and consistency. "We found with our old flame cutting machines that dimensions were susceptible to drifting during cutting and this could lead to re-working and scrap parts. While the Kerf flame machines can cut beyond 300 mm thick material, we are generally cutting up to 150 mm plate and at these dimensions, drift was possible in all axes. The Kerf RUR4500 has eliminated this issue," Daniel Morley explains.

He concludes: "The Kerf RUR4500 has delivered everything we wanted and more. It has streamlined our workflow, reduced labour requirements, improved machine utilisation and uptime by 50 percent and it has improved productivity by over 20 percent. Additionally, we have a reliable, well supported machine that is very accurate with the UltraSharp cutting technology and that gives us the confidence to take on any future challenges."

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Redesigned bandsaw achieves higher performance cutting

KASTO has comprehensively re-engineered its 'tec' range of top-end, horizontal bandsaws, which are intended principally for automatic, high performance processing of all materials including difficult-to-cut metals using carbide saw blades. New features have been incorporated enabling faster production, allowing cutting cycles to be halved in some cases. At the same time, tool wear is reduced.

The benefits are largely a result of the incorporation of a pair of servo motor-driven ballscrews for steplessly adjusting the downfeed to optimise the management of bandsaw blade chip load. The system is combined with the integration of KASTOrespond technology, originally developed by the German manufacturer for its 'win' bandsaw range, for continuously monitoring the pressure on the blade so that the downfeed force can be optimised, irrespective of whether solid material, tube or profile is being cut.

The saw feed control, without the need for additional and often error-prone sensors, enables cutting parameters to be continuously adjusted, not only at blade entry and exit but also throughout the entire cut. By constantly detecting the changing engagement length when processing round



stock and also sensing hard spots in any material, KASTOrespond converts the measured forces on the tool into digital signals for adapting the downfeed speed.

The user needs only to enter data such as cut lengths and number of pieces, together with the type of material to be sawn and its diameter, directly at the proprietary KASTO ProControl with colour touch screen interface. Everything else is taken care of automatically.

There is an additional, environmental benefit of electrically actuated ballscrew feed, as only a much smaller, separate hydraulic unit is required for stock positioning and clamping, so there is a significant reduction in the amount of power needed to run these new machine tools.

The second-generation KASTOtec machines will be presented for the first time in the UK at MACH 2020 on the stand of the firm's Milton Keynes subsidiary. Demonstrated under power will be an AC5 model, which is capable of cutting stock up to 530 mm in diameter or bundle cutting up to 530 x 630 mm.

As with the earlier machine range, a steel and mineral cast baseframe delivers efficient damping and quiet running, even when cutting materials such as titanium, Hastelloy and Inconel. Vibration, the main source of sawing inaccuracy and machine wear, is lowered further by spring-loaded tensioner guides inside the top of the saw head guarding that provide the band with extra support.

New is a frequency-controlled bandsaw blade drive through a bevel spur gear that exploits the advantages of both gear types, delivering 15 kW of power and infinitely adjustable cutting speeds from 30 to 300 m/min. Pre-tensioned linear guides, each with two grease-lubricated carriages, also help to extend the working life of the machine.



The manufacturer has even gone to the trouble of including a system for automatically optimising the position of a pair of cleaning brushes relative to the band so that chips are always removed optimally from the saw teeth, preventing recutting and consequent tool wear and damage.

Larger bandsaw for the workshop

The KASTOmicut range of pivot-bow, metalcutting bandsaws from KASTO has been extended upwards and downwards from the three pre-existing, automatic and manually operated 2.6 models that were launched at MACH 2018.

The new KASTOmicut U 4.6, which will be exhibited at MACH 2020 for the first time in the UK, can saw flats up to 520 mm wide at 90 degrees and mitres from -45 to +60



degrees. Material clamping is effected by a horizontally acting, hydraulic vice. Band speed range is wide at from 12 to 150 m/min for processing an extensive range of different materials cost-effectively.

A heavy, torsionally rigid, welded saw frame provides stable support for the blade and allows high band tension, ensuring a good quality cut even with hard-to-machine materials. Various accessories are available including a rotary table to support the material.

Included in the range of larger machines is KASTOmicut E 4.6, which has the capacity to cut 335 mm diameter round and 460 x 335 mm flat material. It is designed for single-sided mitring at any angle from 0 to +60 degrees.

For users who mainly saw smaller workpieces up to 180 mm diameter, KASTO has introduced the compact KASTOmicut P 1.8 capable of mitring between 0 and +45 degrees. Downfeed rate is determined by manually guiding the saw frame and the blade is driven by a 1.5 kW three-phase motor, ensuring high quality cutting.

Depending on machine model, the shortest cutting length is between 6 and 10 mm. With a remnant length of 15 to



30 mm, users can make maximum use of the material being sawn. An efficient worm gear drive provides top performance and the advanced design ensures a constant cutting force for efficient processing of different materials.

As a large percentage of the parts used in the various bandsaw models is identical, KASTO is able to offer them at attractive prices. An extensive variety of accessories is available to extend the application of all the saws.

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Great craftsmanship combined with innovative technology for exceptional design ideas in metal

Those seeking to turn original and distinctive ideas into metal products would be well advised to make the trip to Burgwedel near Hannover, where Rosenhagen Metallbau's state-of-the-art production facilities are located. Operating under third-generation management, Rosenhagen Metallbau provides customers with custom-built products, whether classic wrought-iron work or contemporary metal items. It focuses mainly on indoor and outdoor staircases for non-commercial customers, commercial enterprises and public institutions. Its 23-person team handles every step in the process, from planning to manufacturing and installation; turning even the most unusual ideas into reality. Rosenhagen general manager Heiko Rosenhagen explains the secret to his company's success: "We combine tradition with innovation. We employ advanced CAD technology in planning and development and apply the best technical and mechanical means to production, together with our long tradition of craftsmanship."

The company's customers' special needs and unique design ideas require not only the highest levels of professional skill but also the equipment and methods necessary to carry out projects with the requisite precision and efficiency. Individuality often goes hand in hand with complexity. However, particularly when it comes to stairways, the variety of materials used for railings, handrails and steps place great demands on production. A variety of railings, steps, handrails and spindles may produce a very individualised design, but that in turn requires the right kind of processing methods and technologies to achieve the proper balance between precision manufacturing, optimum use of materials and efficient use of personnel. Moreover, where creative designs are



involved, the proper labelling of the numerous components often involved in such designs can greatly simplify both shipping logistics as well as subsequent assembly, an economic consideration that should not be overlooked.

Technical innovation and maximum precision are especially important when individual components need to be cut to meet a set of specified requirements. It's no surprise, therefore, that Rosenhagen decided a year ago in favour of the universal mitre saw KKS 463 NA from Kaltenbach, a leading producer of equipment used in working with steel, aluminum and other non-ferrous metals. Sawing technology used in manufacturing and production has, for a long time, involved more than simply cutting various kinds of materials. It now involves the combination of advanced technology with multi-purpose software applications and other functions to produce long-term savings and optimum manufacturing processes. This is certainly the business philosophy at Rosenhagen and the KKS 463 NA provides what the company requires to make it reality.

At its facilities in Burgwedel, Rosenhagen makes use of every type of mitre cut the KKS 463 NA offers, whether it's the 45 degree zigzag cut for stair steps or the +30 to -30 range of mit cuts used for various types of handrails and railing spindles. The servomotor makes it possible to place the rotary table in practically any position and automatically set it to a pre-selected cutting angle. Changing the bevel angle has no effect on operating speed because this

occurs as the material is being fed in or components are being extracted.

In addition, a vertical clamping vice on the side of the saw bench automatically pivots to a pre-selected bevel angle. This ensures that residual lengths are kept as short as possible and that materials are clamped firmly in place. Moreover, this unique technology eliminates the need for so-called aluminum yokes. These are cut by bevel angle and must therefore be switched out at regular intervals. The KKS 463 NA thereby reduces recurring costs for replacement parts.

The fully automated circular saw KKS 463 NA has replaced the manual saws previously in use at Rosenhagen and scores high marks by allowing the company to make optimum use of personnel. Automation results in changes in terms of cost planning, which in practice allows more personnel to be shifted over to final assembly. In addition, it also improves production times while lowering error rates. This means higher productivity at less time per unit, which really pays off in terms of competitive advantage.

The KKS 463 NA is programmed and operated entirely via touch screen using the Windows graphic user interface PROFICUT. Rosenhagen uses specialised software specifically designed for stair manufacturers, from Hartmann. Component lists, along with all programmed geometries and bevels, are exported via a special interface directly from the stair production program in CSV-format, Excel, or via DSTV files, NC files, German Stahlbauverband. Precision and optimum use of materials play a decisive role in stair



construction. Only precision cutting ensures a proper fit while the costs for material mean waste should be avoided as much as possible. At Kaltenbach, mechanical and software innovations were employed to minimise projecting edges and to reduce minimal offcut lengths to roughly 15 mm. In addition, the program automatically calculates feed rate and cutting speed and transfers this information directly to the saw. This results in the kind of precision cutting and perfect bevelling that Rosenhagen have come to appreciate.

As the company has to handle a large variety of different materials and dimensions, the employees at Rosenhagen have come to value this saw's tremendous flexibility. Clamping vices and clamp pressure are set automatically through the use of a long-stroke tensioning cylinders, requiring no action on the part of the operator. Maximum allowable clamp pressure can be recorded in a database for raw materials.

In order to keep packaging and installation of the many components that go into a stairway from turning into an indecipherable puzzle, the KKS 463 NA uses



inkjet labeling system so that parts can be easily identified later on. This helps avoid errors during shipping and final installation. Components are marked with UV resistant ink that is either waterproof or can be wiped clean. Components are marked automatically as they are being transported to a predetermined sorting position, so no additional processing time is required. As customised painting is usually carried out by the customer on-site, Rosenhagen considered it especially important that the ink not show through after painting is completed. Customer-specific software is employed to set the labelling to be used on each individual component. This process has

been perfected to the point that it's now possible to automatically program 80 percent of the information used in labelling.

Materials are fed to the fully-automated KKS 463 NA saw via a flat magazine. The material is transported over a powered roller conveyor to the saw and cut as instructed by the program. After that, the parts are then automatically sorted to pre-selected positions, separating out first cuts and remnants.

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Blackman & White appoints i-Sub as exclusive UK distributor for sign and graphics industries

Blackman & White has appointed i-Sub as the exclusive UK distributor of its range of cutting systems for the sign and graphics industries. With technology and innovation firmly at its core, Blackman & White offers cutting-edge solutions for a wide range of companies, from global manufacturers to start-ups.

The new agreement, which takes place with immediate effect, will see specialist i-Sub bring its extensive experience in large format digital print technology to the fore. i-Sub is one of the longest established suppliers of wide format printers and cutters, having partnered with Agfa and Mimaki for the past 15 years.

As the UK's only manufacturer of cutting systems, all of which are designed and manufactured from start to finish at the company's UK factory in Maldon, Essex, Blackman & White builds machines that are recognised for their robust and reliable build quality. With a highly experienced UK-based technical support team, Blackman & White cutters can be manufactured as laser-only cutting devices or with a combination of laser, knife and routing options. They were the first in the industry to offer a laser as one of the modular interchangeable toolheads with the ability to cut multiple substrates on a single machine.

Blackman & White cutters also integrate with industry-standard RIP software and CAD and nesting packages, enabling the streamlining of workflow for the efficiencies

and production benefits essential for business profitability.

On the new agreement, Andy Spreag, managing director at i-Sub, says: "Blackman & White has an excellent technical heritage, having been in business since 1964 and their products are at the perfect price/performance ratio for the sign and graphics industries. Our partnership with Blackman & White offers our customers a high-end turnkey solution for all their wide format cutting and finishing requirements.

"The digital cutters support knife, laser and router tooling and as such offer one of the most flexible, configurable and versatile cutting systems available on the market today. The Blackman & White system is the only solution that offers a laser system on the same platform as the traditional cutter router and knife setup. This delivers excellent cutting and finishing quality which in turn provides our customers the opportunity for more profit.

"Blackman & White systems can be supplied with a comprehensive range of tools and accessories and configured for cutting the widest range of media and materials. Each cutter supplied is configured to specifically meet the requirements of each individual business and, being a modular system, there is always the option to add tooling and functions at a later date if required."

Andy Spreag adds: "With the textile



sector enjoying good growth, the Blackman & White laser cutting functionality will be a key selling point."

A Blackman & White Genesis V system will be installed in January at i-Sub's Kettering head office and showroom for demonstrations. Configured with all tooling options, customers will be able to see an array of currently compatible materials cut and finished.

Alex White, managing director at Blackman & White, adds: "The new commercial partnership with i-Sub, a strong and experienced sales operation with more than 15 years' experience in the supply of high-end finishing systems into the sign and display market, allows us to further focus our efforts on the continual research and development of industry leading cutting machines to meet customer demand for faster and more effective finishing solutions."

Founded in 1964 with technology and innovation firmly at its core, Blackman & White delivers cutting-edge solutions used by a wide range of companies, from global manufacturers to start-ups.

With years of engineering experience, Blackman & White machines are easily identified for their robust and reliable build quality and their flexibility of holding multiple combinations of knife, laser and marking tools.

This flexibility goes hand-in-hand with Blackman & White's record for quickly delivering a return on investment for customers in a wide variety of sectors including marine, composites, textiles and digital print applications.



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ProNest LT nesting software for use on smaller CNC cutting tables

Hypertherm, manufacturer of industrial cutting systems and software, has announced low-cost subscription pricing for its ProNest® LT CAD/CAM nesting software for light industrial cutting applications. Rather than purchasing the software outright, as is typically required, smaller companies and individuals who have air or conventional plasma and oxyfuel cutting machines can now subscribe to ProNest LT on a monthly, annual, or three-year basis.

Monthly pricing begins at \$29.99 and subscribers have the freedom to start a subscription, add or remove users or features when needed and cancel anytime. Hypertherm is currently offering a free seven day trial subscription for anyone interested in trying ProNest LT. To learn more visit www.hypertherm.com/ProNestLT.



In the past, small businesses including general fabricators, artistic metal workers, sign-makers and HVAC duct shops, often had to rely on software that didn't fully meet their needs. Technical support was often limited to self-help online. Achieving optimal cutting outcomes right from the first cut wasn't easily possible. However, with ProNest LT, subscribers get access to one-on-one live support from knowledgeable professionals, in addition to online resources such as video tutorials. Also, expert-level cutting parameters based on the specific material type and thickness are included with the software providing optimal part separations, leads and kerf compensation for the job. Advanced automatic nesting is also available to ensure good material yield for those larger jobs.

"ProNest LT provides a single software solution for businesses running smaller CNC tables. Though the software is designed to support any brand of plasma or oxyfuel, users will find the software delivers the ultimate performance when used with Hypertherm Powermax and MAXPRO systems giving the best possible cut quality, productivity and efficiency," says Derek Weston, product marketing manager for Hypertherm CAM software and controls. "It gives them access to professional grade cut quality at an affordable price in an easy to learn package that comes with unlimited technical support."

Hypertherm designs and manufactures industrial cutting products for use in a variety of industries such as shipbuilding,

manufacturing, and automotive repair. Its product line includes cutting systems, in addition to CNC motion and height controls, CAM nesting software, robotic software and consumables. Hypertherm systems are trusted for performance and reliability that result in increased productivity and profitability for hundreds of thousands of businesses. The company's reputation for cutting innovation dates back 51 years to 1968, with Hypertherm's invention of water injection plasma cutting. The 100 percent associate owned company has more than 1,400 associates along with operations and partner representation worldwide.



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Tipper body manufacturer installs UK's largest TRUMPF bending machine

The Thompsons Group, the UK manufacturer of tipper bodies, has taken delivery of a TRUMPF TruBend 8600-80 bending machine at its Blackburn facility. The machine, which is the largest TRUMPF TruBend in the UK, is being used to form tipper side panels from 4 mm thick Hardox® abrasion-resistant steel.

Thompsons, which has UK sites in Croydon, Blackburn, Dover and Edinburgh, says that it builds and sells more tipper bodies than all of its competitors combined. Since 2000, the business has expanded five-fold.

Following its inception in East London 45 years ago, Thompsons has manufactured over 30,000 tipper bodies, of which around half are still in operation today. The bodies cover the full range of commercial vehicles, from 3.5 to 44 tonnes Gross vehicle weight (GVW). Thompsons' customers not only come from the construction industry, but sectors such as waste, environment, highways, utilities and rental. Top of the rigid range is the Loadmaster, some 15,000 of which have been delivered in the past 20 years.

"With order volumes rising there is a constant need to keep pace with production and invest in our future," explains director Neil Griffin. "We recently installed a robotic welding cell, which shifted the bottleneck to bending. In addition, even though our existing press brake offers a capacity of 400 tonnes, we needed more to help us process 4 mm thick Hardox, which is a tough, wear-resistant steel with a hardness of 450HB."

Neil Griffin and his team scrutinised three potential bending machine suppliers, but it was TRUMPF that impressed the most. He explains: "We went to the TRUMPF factory and saw the machines in action. Once they assessed our application, the TRUMPF team recommended the TruBend 8600-80, which we knew immediately was the right machine. At the same time, we purchased the TRUMPF TruLaser 3030 laser cutting machine."

The TRUMPF TruBend 8600-80 impresses not just with its precise versatility, but its large open height, throat depth and press force. Users can process particularly large



and heavy parts. Thompsons' TruBend 8600-60 offers a 600 tonne press force and to fulfil the customers' requirements TRUMPF customised the machine with an additional 8 m bending length option.

Neil Griffin continues: "After profiling, the side panels of the tipper bodies each require up to 12 bends, which is where the tonnage of the TRUMPF TruBend 8600-80 really comes into its own. Having capability of this type in-house is a real market advantage as we don't have to rely on subcontractors and thus avoid all the associated costs and lead-time issues that strategy brings. Moreover, all Thompsons' tipper bodies are manufactured specifically for each customer who can specify the height, length and width of the tipper bodies they require. As we manufacture in-house, meeting these needs could not be simpler."

Thompsons manufactures circa 25 Hardox tipper bodies on a weekly basis, which means 50 sides to bend, plus floors and tailgates. The new TRUMPF TruBend 8600-80, located at the Blackburn factory, is currently working a single day shift but a night shift maybe required to keep up with demand.

"Having the higher tonnage machine makes light work of the Hardox panels," states Neil Griffin. "In addition, the machine

is more accurate than our existing press brake. As a company, we are always looking to improve and innovate and machines, such as the TRUMPF TruBend 8600-80, serve to future-proof our business."

Parts arriving at the TruBend 8600-80 for bending will likely have been profiled on the company's TRUMPF TruLaser 3030 laser cutter. Importantly, the TruLaser 3030 features the optional TRUMPF Highspeed Eco function, which allows faster profiling with up to 70 percent less gas consumption.

When acquiring the TruLaser 3030, TRUMPF simplified the process by buying and removing the company's old laser cutter.

Neil Griffin concludes: "We've had nothing but a very positive experience with TRUMPF, both from a machine and people perspective. As a result, we have high hopes for a successful partnership together moving forward. Any high-quality, market-leading product inevitably has leading-edge technologies behind it and tipper bodies are no exception."

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JETCAM releases new versions of Expert and Orders Controller

JETCAM Expert v20.31.00 benefits from several global interface enhancements including a new Screen Macro Recording feature that allows users to assign menu options or keyboard shortcuts to strings of commands, drastically reducing the time to perform common functions. Unlimited UNDO/REDO allows the user to step back through multiple actions if required. Logic improvements across the board in areas such as fly cutting and common cutting can further reduce CNC machine runtime.

JETCAM Orders Controller (JOC) 3.37 now includes enhanced static nest ordering, allowing users to select one or more nests in the nests screen and see if they can be used to fulfil parts in the orders list. Users can then modify the number of runs of each nest in order to see the optimum number required to fulfil the orders list. JOC can also create image thumbnails of components during CAD import. These can then be used by third-party systems such as MRP to show an image against a component. To aid customers where network stability and

performance are sub-optimal, JOC now makes multiple attempts to ready component data, ensuring that temporary network glitches will not impact processes from taking place.

There are also hundreds of other improvements and fixes throughout both applications. Martin Bailey, general manager, explains: "These releases focus on the user experience, with features such as Screen Macro Recording in JETCAM Expert and Static Nest Ordering in JOC both allowing users to perform tasks much quicker than before. We've also made significant 'under the hood' enhancements to many of our automation technologies, so not only do they take less time to run but they also deliver improvements in CNC machine and material efficiency on the shop floor."

Videos of new functions are available to view in the JETCAM online video tutorial 'University', which is free for all JETCAM customers. Both products are available for immediate download for free for all



customers with a current maintenance contract.

JETCAM International has been developing and distributing its JETCAM Expert range of CAD/CAM software since 1986, serving the sheetmetal and aerospace/automotive composite cutting industries. It is in use in 82 countries worldwide.

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Leading composite and advance materials slitting company doubles capacity

Composites and advanced materials precision slitting company Bindatex has doubled its capacity by investing in a new slitting line.

The new line has increased Bindatex's capacity to 30 tonnes per year. This increase in capacity has also generated five new jobs. The new line can cut UD, prepreg and composite materials to widths of just 3.175 mm.

The Manchester-based company, that has been cutting composites for over 15 years, is the only company in the UK that can undertake precision slitting to widths as low as 1 mm. The narrow width poses a challenge for many composite cutting companies.

Bindatex's managing director, Chris Lever, states: "This new slitting line has doubled our capacity and allowed us to recruit more staff. It is an exciting time for Bindatex as we expand our company."

Bindatex's lead time from order to delivery is up to six weeks, half the time of other larger companies in the sector.

The UK-based company is an approved supplier to major thermoplastic and thermoset manufacturers across the globe. Its customers include world class material manufacturers and end users across composites, aerospace, automotive, marine, advanced manufacturing, healthcare, energy and renewables.

It is particularly proud of its flexibility with regards to order size. Working with small developmental orders allows Bindatex's customers flexibility in their workload.

Chris Lever says: "We can meet orders of all sizes as our nimble operations can quickly change to address the varying needs of our customers. Our close working relationship with our clients builds trust and understanding of their business needs, which we constantly strive to support."

Bindatex Advanced Materials Cutting is an ISO 9001 Certified company which specialises in the precision cutting of 'difficult to cut' materials. It constantly re-invests in machinery and processes to provide market leading composite



formatting services. It is an approved supplier to major thermoplastic and thermoset manufacturers.

The company was formed in 2004 to service the traditional but demanding world of book binding and printing. It soon became apparent that Bindatex's capability in cutting difficult to handle materials could be applied in different industries including the growing composite sector.

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Capacity boost as Midland Pressure Diecasting invests £250,000 in new machinery

One of the Black Country's fastest growing foundries is finishing the year on a high after it pressed the button on a £250,000 project.

Midland Pressure Diecasting (MPD) has boosted its output significantly after installing a new fully automatic aluminium die casting machine at its Willenhall facility to add to its fleet of automated die casting machines.

The latest venture will introduce efficiencies and create an additional 20 percent capacity to take on more work, which will generate a number of new jobs locally.

Plant investment is an area the company is continually reviewing as part of ambitious expansion plans, with staff actively encouraged to put forward improvement projects and spending suggestions.

Ash Suman, managing director at MPD, is delighted with how 2019 has panned out: "We are always looking at company improvements, whether via investments into plant, processes or our people. For the most recent example, we decided to look at how we could become more lean, which, in turn, would also introduce a host of operational efficiencies and, importantly, additional capacity.

"The implementation of this new machine is the first part of our restructuring strategy and the target is for it to be operational before the end of the year. We have additional plans for further investment, growing our business and helping showcase a positive outlook for UK manufacturing."

The latest spend has marked a very good three months for the firm, with a new contract secured to supply a family suite of new tooling and castings, generating a 15 percent growth in turnover.

Bosses at MPD believe the work was secured due to its ability to offer a

comprehensive service, from concept to delivery and encompassing professional advice on Design for Manufacture (DFM) and Design for Assembly (DFA) along the way.

In addition to the excellent technical advice provided, the client was also impressed with the supply of high-quality tooling, die casting, press tooling and CNC fixtures and how strict scheduling demands were met.

Ash Suman continues: "The new contract highlights how we can work more closely with our clients in the early design stages and, by offering our industry expertise, we can add real value before we even get to the manufacturing process.

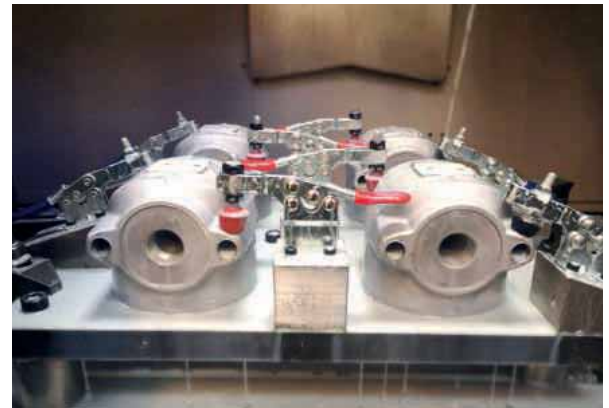
"Next year will see the start of one of our biggest ever transformation projects, with the entire factory being redesigned to optimise our manufacturing performance. It will take about three months to complete, but will be a game changer when finished."

Midland Pressure Diecasting, which boasts a £4m turnover, offers aluminium and zinc high pressure die casting services to customers in batch sizes, ranging from 50 parts to five million. Components as heavy as 6 kg are produced at the company's two facilities spanning a combined 80,000 sq ft.

The company supplies high-quality tooling and provides CNC machining services to customers who require parts to be supplied finished for their assemblies.

It is one of the fastest growing die casting foundries within the UK. The company has grown from a start-up in 2000 to the multi-million-pound turnover SME it is today.

Year by year the company has driven itself to diversify and offer its customers better value-added services from the supply of die castings, to machined castings, to painted and plated castings delivered finished to its customers.



MPD offer in-house product, tool design and manufacturing services to customers, delivering quality and control, as well as peace of mind via total project management. Such commitment by the management team has ensured its continued success and growth into the future.

If you have an existing or new requirement for die castings, the company can offer you a high level of service and technical expertise, taking into account your manufacturing processes and deliver quality product to your door. Its in-house design and tool manufacturing team can assist with any casting projects and any CNC machining requirements.

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