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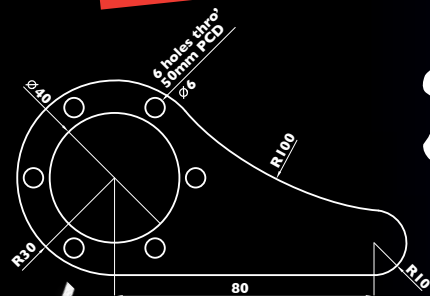
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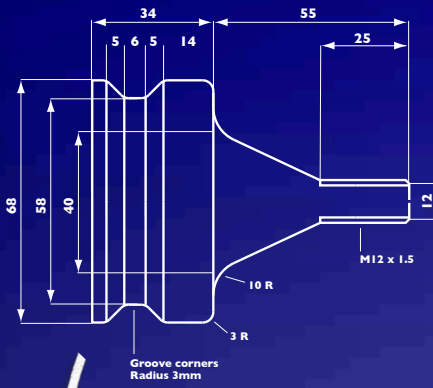
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# 5-axis measurement without compromise

Measurement is an essential part of manufacturing, used to control processes and verify products. However, measurement time is often viewed as non-productive, causing unwanted bottlenecks and putting pressure on manufacturers' operating margins. Renishaw's 5-axis measurement product range for coordinate measuring machines (CMMs) claims to be one of the biggest step-changes in measurement capability ever introduced in industrial metrology and goes a long way to overcoming these challenges.

The need to retain accuracy has historically compromised the ultimate speed of the measuring process, due to the characteristics of a CMM's structure. The non-linear motion of a Cartesian CMM induces accelerations and decelerations that twist and deflect the machine structure, and result in measurement errors that increase with speed and acceleration.

CMM manufacturers work relentlessly on software and machine improvements to overcome those limitations, but ultimately the physical nature of the CMM structure constrains further improvement.

REVO® 5-axis systems approach this challenge from an entirely different perspective, minimising CMM accelerations whilst moving the stylus very rapidly over the component surface through the simultaneous control of the



three machine and two probe head axes (X, Y, Z and A, B).

Additionally, the REVO system offers five different probe families, each specifically designed to maximise the advantages of 5-axis motion and infinite positioning. The probes are automatically interchangeable and include tactile scanning, touch-trigger, surface finish and non-contact vision probes. All are used within a common coordinate reference frame and provide the choice of an optimum tool to measure multiple features all on a single CMM platform.

Automotive is one sector benefitting from this technology, with manufacturers finding unparalleled advantages in the expanded SFP2 surface finish measurement product range, offering operator independent data collection and the opportunity to eliminate dedicated surface finish equipment. By integrating automated roughness measurement and drastically reducing the number of probe styli required to measure complex parts, REVO systems have a direct impact on powertrain manufacturing effectiveness.

Renishaw has always been an innovation leader in industrial metrology. The company's first product, the touch-trigger probe, led to a revolution in three-dimensional co-ordinate measurement. Ever since, a strong commitment to research and development has brought to market products that have been milestones in industrial metrology. The REVO 5-axis measurement system is leading a new revolution in quality control, enabling manufacturers to stay competitive, push the boundaries of their production processes and improve the cost effectiveness of their manufacturing.

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**[www.renishaw.com/en/revo-5-axis-measurement-system-10438](http://www.renishaw.com/en/revo-5-axis-measurement-system-10438)**

# Manufacturing in motion

**MACH**  
09-13 April 2018  
NEC Birmingham UK  
[machexhibition.com](http://machexhibition.com)

With just a couple of months to go before the doors open to MACH 2018 at the NEC in Birmingham, visitor registration is now live. MACH 2018 takes place from the 9th to the 13th April 2018 and will be located in a new home on the atrium side of the NEC, in Halls 17, 18, 19, 20, 6 and 7. This is the first move of the show since relocating to the NEC when it first opened in 1976, and reflects the changing technologies the show covers. Visitors are invited to register early for their Entrance Pass and Fast Track Entry Pack by clicking here.

James Fudge, head of events at organisers the MTA says: "MACH prides itself on attracting top-quality visitors with real buying power and the ability to invest in new equipment. The new hall layout will help create a brand-new visitor experience which is easier to navigate, showcasing all the different technologies in action under one roof. It will be a more interconnected show, just as we have a more interconnected industry."

"For MACH 2018, we have worked hard to provide visitors with a new way to connect with exhibitors. Our smart badging system provides every visitor with an interactive badge, allowing them to collect

information from exhibitors in a quick and effective manner, without the need to carry lots of cumbersome documents. Data is transferred live to the visitors' online portal, ready to download as soon as they leave the show. This investment by the MTA in smart badging reflects the digital nature of the advanced technology on show at MACH."

James Selka, CEO of the MTA, says: "The show will be 2018's biggest display of live, working technology. At the core of the show, exhibitors will showcase the latest developments in metal cutting, forming and finishing along with tooling, CAD/CAM and laser technology. The number of companies displaying additive manufacturing technology has grown considerably and exhibitors tell us they will be focusing on the digital factory, with more automation and connected manufacturing processes on display than ever before. New for 2018 is a specific IT for Manufacturing Zone, where companies offering connected solutions for the fourth industrial revolution will be on-hand with practical displays and demonstrations."

"So, whilst the show will still attract the decision makers, engineers, designers and researchers who work in manufacturing, it is now a great place for chief information officers looking at systems and chief data officers who are adopters of these disruptive technologies to find new suppliers and experience the latest solutions. The vibrant seminar programme at MACH will feature subjects such as digital manufacturing, disruptive technologies, additive



manufacturing and key 'meet the supply chain' networking sessions. The content is designed to provide clear thought leadership at a time when manufacturing is experiencing huge change, and we believe visitors should allow more than one day to experience everything MACH has to offer."

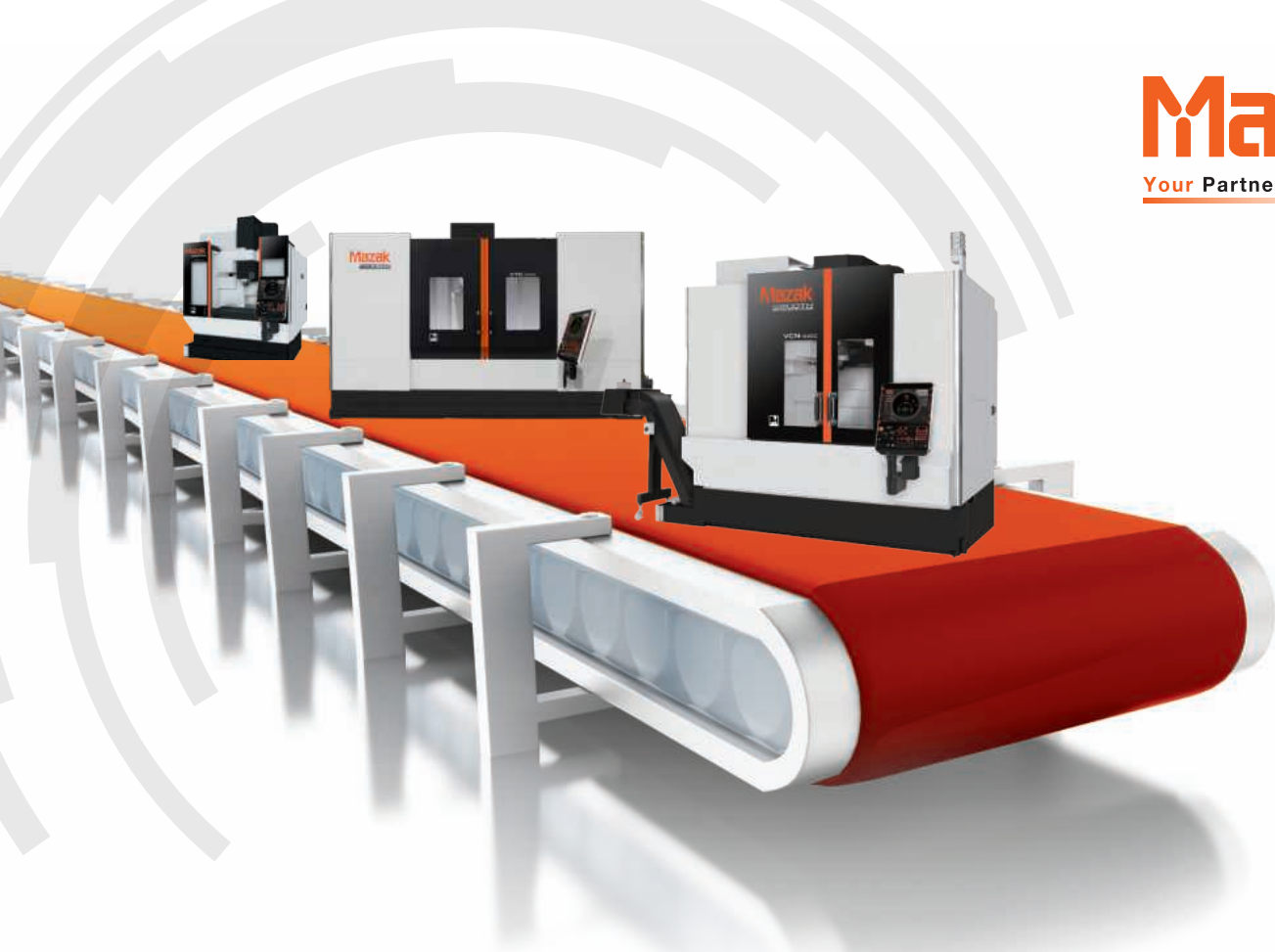
James Fudge concludes: "We know there are lots of regional and specialist shows people can visit to find out about manufacturing technology. The MACH difference is to bring all these technologies under one roof over a five-day period. With a single visit, companies looking to invest in and adopt any one of a number of new technologies can assess the options and be at the forefront of the fourth industrial revolution."

MACH was established more than 100 years ago by the Manufacturing Technologies Association (MTA). It is the largest manufacturing technologies event in the UK, attracting in the region of 600 exhibitors and more than 25,000 visitors. Taking place from 9th to 13th April 2018 at the NEC in Birmingham, the biennial exhibition brings together the latest developments and best innovations. MACH provides manufacturers of all sizes and sectors the chance to network with key clients and prospects as well as gain insight into their needs and future vision for supply chain manufacturing. For more information visit [www.machexhibition.com](http://www.machexhibition.com)

The Manufacturing Technologies Association (MTA) is the UK trade association for the Manufacturing Technologies industry. The MTA represents the core of engineering based manufacturing and aims to promote the use and innovation of advanced technology in manufacturing.

Further information about the MTA and our members can be found at [www.mta.org.uk](http://www.mta.org.uk)





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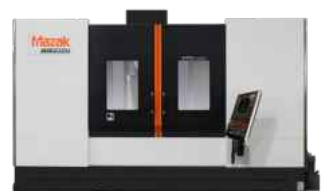
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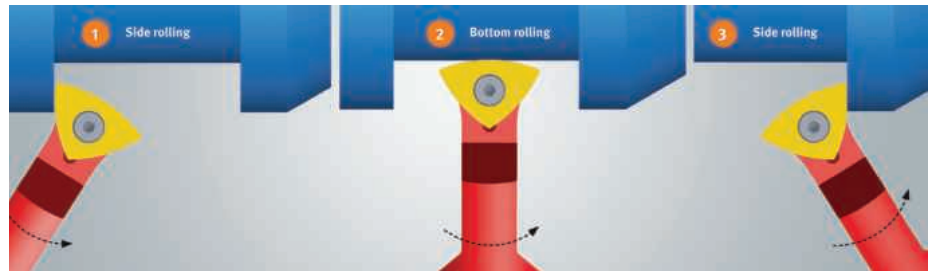
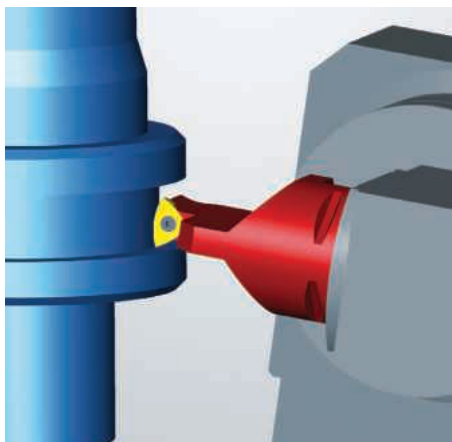
# hyperMILL shows an OPEN MIND to turning innovations at MACH

hyperMILL® has long demonstrated its position as a benchmark in high performance CAD/CAM machining solutions and at MACH 2018, the leading CAM vendor will turn its attention to enhancing productivity by up to 90 percent for turned part manufacturers.

The exhibition will see a UK exhibition premiere for hyperMILL Version 2018.2. OPEN MIND will be presenting Virtual Machining, re-affirming the leading position of the hyperMILL MAXX performance machining system that can reduce cycle times by up to 90 percent. The package will also see the inclusion of the Vandurit rollFEED® turning system.

Working in collaboration with tool manufacturer Vandurit, OPEN MIND now offers an exclusive hyperMILL CAM strategy to match the turning development. This collaboration introduces a new solution for CNC turning that increases process reliability and significantly reduces machining times and tool-wear by up to a staggering 90 percent. These themes are all commonplace benefits in the evolution of the hyperMILL CAM system.

The efficient rollFEED turning strategy in hyperMILL generates flawless workpiece contours that can be achieved in no time at all. As a 3-axis machining strategy, rollFEED turning makes it possible for the entire contour of the cutting edge to roll-off rotationally symmetric surfaces of any shape. The cutting movement is produced by a horizontal swivelling of the B-axis with simultaneous compensation for the X and Z-axes. This means that grooves can be



machined with a single tool in a single movement.

The CAM strategy automatically guides the tool from the first to the second plane level via the cylinder face. Through the combination of roll and turn movements, workpieces with everything from small to large radii can be machined with complete collision checking. This makes for full process reliability. The hyperMILL rollFEED turning strategy is perfectly matched to Vandurit's three rollFEED components, cutting inserts, tool system and drive unit. The drive unit compatibility also makes it possible for Vandurit to refit lathes that do not feature a third axis.

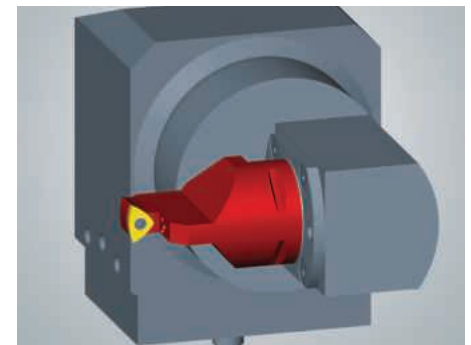
For the end-user, the Vandurit system is suitable for turning plane and cylindrical surfaces, concave and convex faces as well as grooves and inclinations with massive cycle time reductions. Suitable for internal and external turning, the rollFEED system can machine all material types and it only requires two different insert geometries. The reliable and stable process can reduce cycle times by 90 percent, reduce tool consumption and costs by 90 percent, all whilst guaranteeing 100 percent process reliability.

For more details on how you can reduce both your machining cycle times and turning production times by upwards of 90 percent, make sure you visit the OPEN MIND stand at MACH 2018.

With its innovative ideas, years of CAM experience and milling expertise, OPEN MIND develops both technologically sound CAM strategies and forward-looking solutions. OPEN MIND has made a name for itself internationally as a pioneer in innovative 5-axis technologies.

Today, OPEN MIND stands for a fully integrated product concept with solutions for automated programming, optimised

processes and efficient manufacturing. New ideas are constantly being created for modern manufacturing thanks to this unique blend of computing and production expertise, experience and vision, international character and customised service.



OPEN MIND's recipe for success is due to its focus on the development of CAD/CAM solutions and close customer relationships. It always develops its core technologies in house. Its streamlined structures make the company very flexible and its market position continues to expand consistently due to systematic further development with powerful growth, year after year.

The company's practical, innovative solutions arise from its proximity to the machine tool, the CNC controller and the part that is to be produced. Practicality is therefore an essential factor for OPEN MIND's successful development, which has been shaped by numerous milestones.

**Open Mind Technologies**

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**Stand H17-620**



## Rainford to showcase micro abrasive waterjet machine at MACH

Micro machining specialist Rainford Precision has again taken 'micro' innovation to another level with the new line of Finepart micro abrasive waterjet machine tools. Recognised as the experts and the benchmark in UK precision machining, Rainford is excited by the opportunity to bring the Finepart brand to MACH.

Visitors to the Rainford Precision stand will find an intriguing new method of cutting that will solve a raft of issues for aerospace professionals. Cutting common aerospace materials such as CFRP, glass, ceramic, aluminium alloys and other advanced materials will become a breeze with the new Finepart waterjet machine. In comparison to conventional methods such as milling, wire or die sink EDM, the Finecut waterjet system eradicates the issue of heat generation through machining. By processing parts without generating high temperatures, the Finepart waterjet series eliminates any structural or metallurgical concerns that are critical for the integrity of the finished part in the aerospace industry.

In comparison to established waterjet methods with somewhat limited precision



levels, the Finecut line has a micro-fine jet of just 0.2 mm with a positional accuracy of +/-2.5microns and an adjustable jet pressure from 500 to 4,000 bar. This will provide the aerospace, medical and motorsport industries with a solution that drastically improves precision. Furthermore, it can achieve productivity levels far superior to conventional EDM methods with flexibility far beyond more rigid machine tool configurations.

The Finecut micro abrasive waterjet system has been developed for small to medium size parts with a work area of

500 mm by 500 mm with a maximum cutting depth of 80 mm. The FANUC CNC control system on the Finecut range is a familiar platform for most machine shops, making the new product line an easy to install, simple to setup, flexible and astoundingly productive machine for processing advanced materials.

Rainford is renowned for innovative ranges of drills, end mills, thread mills and circular saws for micro machining and hard material applications from brands such as Iwata, Xactform, Hobe, Louis Belet, Osawa and Union Tool. Added to this, Rainford also has a comprehensive line of Air Turbine Spindles® with spindle speeds varying from 25,000 to 90,000 rpm and the KERN range of micro machining centres.

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# ITC expands MACH space to accommodate multitude of new product lines

Industrial Tooling Corporation (ITC) has booked its largest ever stand for the forthcoming MACH 2018, the UK's showpiece manufacturing event. Recognised as a leading UK cutting tool manufacturer, ITC has booked an 80 sq m stand to accommodate the deluge of new product lines that will be available at the show.

In 2017, ITC invested over £1 m in new production equipment. This has given the company the facility to manufacture high-precision cutting tools from diameters as small as 0.3 mm. At the end of 2017 and through Spring 2018, ITC will be implementing a program to extend existing product lines. This will see many of the most popular ITC product lines being extended to offer tool diameters below 3 mm.

As well as introducing these product extensions at MACH 2018, ITC will be demonstrating its position as a 'full-line' cutting tool supplier with complementary products from globally renowned brands such as BIG KAISER and Widia. Committed to supporting both brands in the UK, the ITC stand will have sections dedicated to each brand.

The dedicated Widia section of the stand will be supported by both ITC and Widia technical engineers to ensure MACH visitors can investigate and subsequently reap the benefits of the new Widia product offerings.



The Widia VariMill Series has been the end mill of choice for many ITC customers for a generation; a testament to the continual evolution of the product line. At MACH, the radical development to the range that is the mainstay of many machine shops will be unveiled. The new Duo-Lock range is a modular system that integrates many of the VariMill milling lines into a new quick-change line.

Convincing customers with its astounding run-out accuracy, maximum coupling stability and length repeatability, the tantalising combination of the VariMill milling technology and the flexibility of the Duo-Lock system offers end users a revolutionary new solution. Whilst the proprietary VariMill geometries allowing roughing and finishing with a single tool, the corresponding adaptors include an extensive line of straight and conical shanks with CV, PSC, BT and HSK configurations available in Duo-Lock sizes of DL16, DL20, DL25 and DL32.

The modular tools that will be on-show at MACH will include the VariMill, VariMill II, 4547, 4548, 4XN0 and 4X48 high performance series, the 4U40 45 degree roughing series, the 4969 ball nose roughing series, 5748 VariMill II ER, 774E VariMill III ER

Series, the 5142 and 5143 AluSurf line, the 8045 Corner Rounding line and the 8046 Corner Chamfering series. Each of these industry leading solutions include a tapered core that demonstrates astounding stability and an eccentric relief design that increases tool life through higher edge stability.

Continuing this theme of flexibility at MACH, Widia has added to the ITC armoury with the launch of the ultimate shoulder milling solution for step-down applications. The new VSM490 Series of Widia indexable insert tools eliminates finishing operations and improves productivity when machining a wide variety of materials.

From an economical perspective, the new VSM490 Series of double sided 90 degree inserts offer four cutting edges to reduce cost per insert and improve economy for the end user. This latest addition to the Widia Victory Shoulder Mill (VSM) range is extremely versatile with a complete line of insert grades that accommodate highly-productive machining of cast iron, stainless steel, steel, aluminium, titanium and a host of challenging aluminium alloy materials. Suitable for operations from roughing through to finish machining, the VSM is offered with screw-on end mills from 16 to 32 mm diameter; Weldon, cylindrical

and shell type end mill tool holders from 40 to 125 mm shell mills and the robust M4000 cartridge milling system from 125 to 315 mm.

Complementing the VSM line at MACH will be the new Widia Victory High Speed Cutting (VHSC) series of milling cutters for aluminium machining. This versatile new line-up is suitable for everything from face milling, pocketing, ramping, circular interpolation boring, slotting and shoulder milling. The high-speed aluminium profiling and pocket milling range is capable of machining at speeds up to 3000m/min with high speed cylindrical end mills, cutting monoblocks and shell mills available in diameter ranges from 25 to 32 mm, 25 to 50 mm and 40 to 80 mm respectively.

While both ITC and Widia are industry leading milling brands, Widia will also be using MACH 2018 to enforce its credentials as a benchmark manufacturer of turning grades. This will be promoted through the new Victory turning grades for steel and cast-iron applications. The WIDIA Victory TN710 series is a new range of coated-carbide inserts specifically engineered for finishing, medium-duty and rough machining of all types of alloyed and



unalloyed steels. The TN7100 series delivers exceptional value on key productivity metrics such as higher metal-removal rate, surface finish, longer tool life, consistent performance, and lower manufacturing costs. The new Victory TN7105, TN7110 and TN7115 grades are offered for light and medium turning applications in steel with a 30 percent performance increase over competitive products.

**Industrial Tooling Corporation Ltd**  
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**Email: sales@itc-ltd.co.uk**  
**www.itc-ltd.co.uk**

**Stand H20-650**

## Hainbuch to demo quick-change clamping

For manufacturers looking for a flexible, effective and efficient clamping system for holding components up to 300 mm, the Hainbuch stand at MACH 2018 is certainly the place to visit. At the exhibition, Hainbuch will be setting the new standard in precision, robust and flexible round part clamping with the centroteX quick change-over clamping system.

The fast to setup centroteX enables end users to choose the correct workholding device with the confidence that changeovers and setups can be conducted with ease and speed. Compatible with the industry leading TOPlus, SPANNTOP and SPANNTOP Mini workholding systems from Hainbuch, the centroteX interface can be used on turning centres, measuring and grinding machines as well as on dividing heads. The system will also accept collect chucks, mandrels, 3-jaw chucks and fixtures, increasing the scope of the workholding device considerably.

This unsurpassed flexibility drastically cuts machine down times and removes non-cutting times from production. By

achieving changeovers with astounding speed whilst attaining a change-over accuracy of less than 0.008 mm, the Hainbuch centroteX generates significant financial savings for the end-user.

The centroteX ensures that the machine operator uses the right workholding device every time with improved quality, productivity and flexibility. With a change-over time of less than five minutes, the extremely rigid and robust centroteX delivers shorter cycle times, reduced setup and change over, as well as an improved repeat accuracy for the end-user.

At MACH 2018, this remarkable system will appear alongside the impressive new Hainbuch MandoTex that will also be making a MACH debut. This standardised quick change-over interface has been developed especially for the MANDO T211/212 mandrels. With a bayonet coupling, machine and clamping device adaptor, the MandoTex offers a huge selection of standard clamping devices, unparalleled clamping forces and micron precision for the optimal workpiece



clamping solution. If you would like to learn more about how the Hainbuch quick-change centroteX and MandoTex can improve your machine utilisation, visit the Hainbuch stand or contact your local Hainbuch representative.

**Hainbuch UK**  
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**Email: nick.peter@hainbuch.co.uk**  
**www.hainbuch.com**

**Stand H19-120**

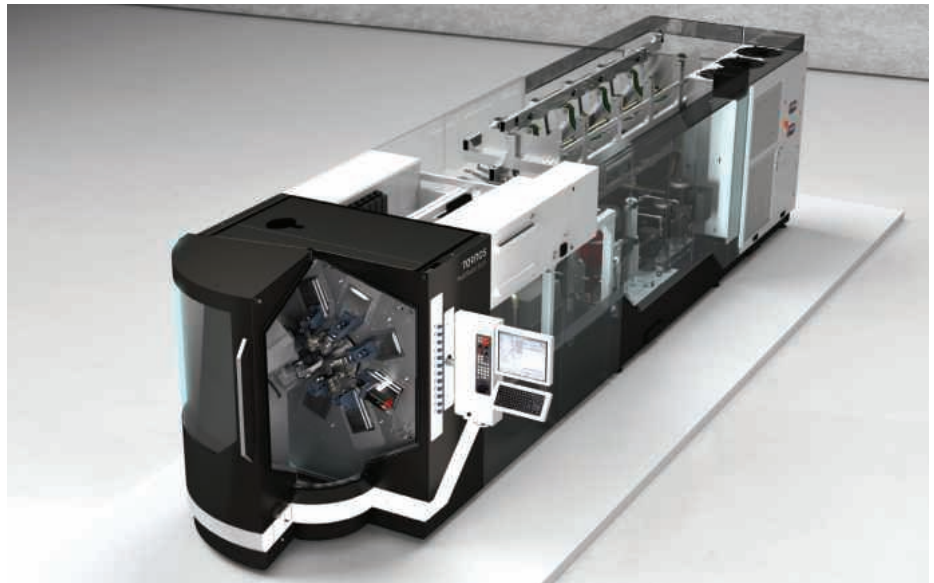
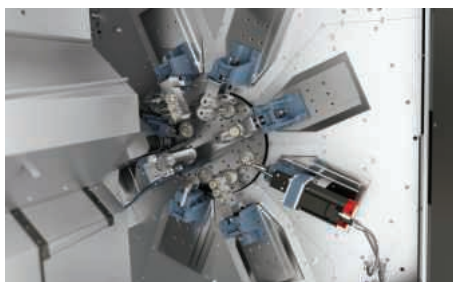
# Tornos MultiSpindle to make its UK exhibition debut

MACH 2018 is just around the corner and Tornos has a treat for turned parts manufacturers, giving a UK exhibition debut to the MultiSwiss 8x26. If you're a turned parts manufacturer looking for something to give you a real competitive edge, you need to see the Tornos MultiSwiss 8x26. This machine, one of a family of three ranging from 14 to 32 mm spindle sizes will appear at the exhibition alongside a number of new technologies.

Equipped with eight spindles and eight slides for main operations and accommodating up to three tools per slide, the MultiSwiss 8x26 takes the performance of the MultiSwiss range to a new level, both in terms of complexity and productivity. With eight highly dynamic synchronous motor-spindles and ultra-fast barrel indexing, the new MultiSwiss 8x26 can produce turned parts up to 26 mm diameter at staggering productivity levels.

The new MultiSwiss 8x26 incorporates powerful independently operating 11 kW motor-spindles that are equipped with a C-axis and counter spindle. Reaching speeds of 8,000 rpm in tenths of a second, these advanced motors make a major contribution to performance and productivity. As an option, the machine can be equipped with Y axes to further boost its capabilities. However, the machine is available in three configurations to meet the demands of the end-user. This includes the entry level option of working without a Y-axis, the option with three Y axes for intermediate applications and the complete machine with six Y axes for the most complex parts. In each machining position, the operator can tailor the speed and machining conditions as required.

From an ergonomic perspective, MultiSwiss machines are as accessible as single-spindle machines and a single-spindle machine operator can quickly become a MultiSwiss operator. As quick to set up as a



single-spindle turning machine, the key difference is that the MultiSwiss is at least five times as productive as a single-spindle turning machine. The machine boasts the largest working area on the market and its exceptional accessibility offers real savings when changing over jobs. This concept makes the MultiSwiss as simple to set up as a single-spindle turning machine; the only difference ultimately lies in the number of spindle collets to change. The machine's swarf removal is also excellent, even when the machine is fully equipped with complex toolholders.

Each spindle is equipped with a C-axis and the machine's hydrostatic technology offers exceptional dampening performance when machining. The MultiSwiss can improve surface finishes and extend tools life by an average of 30 percent and up to 70 percent in some extreme cases, minimising machine stoppages.

The new MultiSwiss also demonstrates seamless integration with all the necessary peripherals built into the machine design. As standard, the MultiSwiss includes the barfeeder, swarf, oil and dual filtration management system, all housed behind the machine in a compact and neat container. Options such as the oil mist extractor, chip conveyor, fire protection system and high-pressure pump can also be seamlessly integrated into the machine. Integrating all these features at the design stage makes the footprint of the MultiSwiss 8x26 extremely compact.

The counter spindle is mounted on two

axes and this means it can work completely independently. Offering up to five tool positions, the MultiSwiss 8x26 can handle even complex operations with two of the five positions providing the option of driven tools. The ultra-dynamic counter spindle with synchronous motor minimises acceleration and deceleration times.

The highly versatile, pre-adjustable quick-change toolholder system developed for MultiSwiss machines makes full use of the ingenious kinematics that focus upon keeping tools close to the workpiece. As a result, the machine can hold up to three tools in each position, making it incredibly flexible. Tornos offers a range of options to meet user preferences and choices including a FANUC CNC system.

As well as demonstrating leading turning technology, Tornos will be giving MACH visitors a demonstration of its Industry 4.0-enabling TISIS process monitoring software. The Tornos stand is the place to get a first look at a state-of-the-art automated Tornos production cell to produce, clean, measure and sort machined parts and when necessary, communicate in-process corrections to each machine (closed loop monitoring).

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**Stand H19-312**

## Lean energy chain and curved rail systems

At this year's MACH exhibition, igus will showcase a wide range of cost-effective, lightweight and maintenance-free bearings and cable management systems for a variety of engineering applications.

Developed to combine the advantages of the E2/000 and E4.1 energy chains in one product range, the E4.1L 'lean' features interior clip in slotted separators that provide up to an 80 percent assembly time saving. Visitors to the stand will see that the innovative design of these lean separators enables layer-by-layer insertion of shelves and cables, and the time savings are increased again by using the new lean honeycomb strain relief.



A complete energy chain system, igus readychain comprises pre-harnessed cables, plugs, connectors and energy chain. It may be quite a simple design or a complex one with chainflex cables alongside pneumatic and hydraulic hoses, which can be assembled and dispatched within three to ten days. OEMs also reduce component storage costs and lower individual parts ordering and shipping costs. In addition, readychain systems undergo extensive quality control and functional tests and come with the igus chain and cable guarantee to agreed and defined parameters.

For applications that require curved rails, such as machine tool guarding systems, the drylin W curved rails and self-aligning carriages offer the perfect solution. A pivoting spherical ball, made of the engineering polymer material iglidur J, is used to self-align the carriage for smooth, reliable movement along the curved rail. As with all drylin systems, they are self-lubricating and therefore run maintenance-free, and are unaffected by



dirt or swarf. Throughout the show, the igus team will be available to take visitors through the benefits and potential applications of their bearing products and cable management systems, as well as provide insight into the full range of igus products.

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**Stand H6 314**

## Mollart to focus on BTA drilling expertise and subcontract production capability at MACH

Mollart Engineering will be focusing on its subcontract and expertise in BTA deep hole drilling technology at MACH following the setting up in 2017 of its BTA Application Centre in the Chessington headquarters. This capability is supported at the exhibition through its sub-contract precision machining operations which specialise in gun drilling, BTA deep hole drilling and multi-axis machining techniques and assembly.

Visitors to the stand will be able to discuss BTA drilling technology with the regional based 'local' specialists that are normally based in the South, Midlands, North of England and Scotland.

Mollart's subcontract capability involves multi-axis machining technology both at its 40,000 ft<sup>2</sup> headquarters in Chessington and the 21,000 ft<sup>2</sup> production facility in Resolven, South Wales. Production installations across the two sites include six Mazak Integrex turn-mill centres, large Doosan turn-mill centres, a range of large capacity turning and machining centres plus subcontract drilling, automatic deburring, ultrasonic testing and surface finishing.

There are also welding and fabrication facilities taking up 10,000 ft<sup>2</sup> plus precision assembly and test with the availability of an ISO7 (Class 10,000) environmental clean room facility in Resolven.

Mollart has ISO9001:2008 and AS9100 Rev.C EN9100:2009 quality accreditations.

The Mollart Engineering group of companies is a precision mechanical engineering business with an international reputation in the pioneering development and building of deep hole drilling machine tools, tooling, including gundrills, deep hole boring and bore finishing.

It also has a high level of expertise as a subcontract machinist and fabricator based on adding value to deep hole processing and general machining and has Quality Management Systems certified to: ISO9001:2008.

Mollart has its headquarters, design and manufacturing operations in Chessington, Surrey plus a modern production facility in Resolven, South Wales. On both sites multi-axis machining is carried out on complex, often high value components, along with part fabrication and the ability to



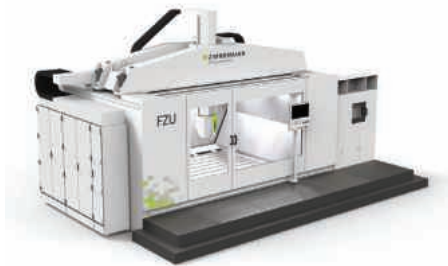
assemble components in our ISO 7 cleanroom facility.

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**Stand H20-855**

# 5-axis portal mill for prototype tool and mould making

A portal 5-axis milling machine has been introduced by German machine tool manufacturer Zimmermann at the lower end of its price range. Available in the UK and Ireland through sole agent Geo Kingsbury, the compact FZU is intended primarily for prototype, tool and mould making as well as machining of composite components such as airframes.



Of thermo-symmetrical and stable design, the machine is ideal for highly productive manufacture from aluminium, plastics and model board. It is well suited to use in the automotive industry, which expects components with almost perfect surface finishes and ever higher accuracies and at the same time needs to introduce new vehicles to the market in ever shorter lead-times.

Unlike other machines in the Zimmermann range, the FZU is shipped in one piece so does not need to be assembled at the customer's premises. The consequent short commissioning time means that the machining centre quickly starts producing components. As a special foundation is not required, installation cost is lower.

Working volume is large for the footprint, with a choice of X-axis travel of 2,000, 4,000 or 6,000 mm, a 3,000 mm Y-axis, and either 1,250 or 1,500 mm movement in Z. Acceleration at up to 3 m/s<sup>2</sup> to 60 m/min feed rate ensures high productivity and short non-cutting times. Maximum table load is 10 tonnes.

The fourth and fifth CNC axes are provided by the new VH10 spindle head, now the smallest in the manufacturer's range. Of slender design, it has minimal interference contours and high clamping force for stable milling.

A powerful HSK-A63 spindle is standard, delivering 34 kW of power and 39 Nm of torque continuously and offering a maximum speed of 24,000 rpm. The A-axis



swivels through 220 degrees, while C-axis rotation is 300 or 360 degrees for the smaller and larger Z-axis travels respectively. Resolution in both rotary axes is 0.0001 degree.

Control is provided by either a Heidenhain TNC 640 or Siemens Sinumerik 840D sl. Other options are spindle probing, tool measuring, and capacity for 40 or 60 tools in the magazine instead of the standard 20 tools.

### 5-axis machining of composite aircraft components

Large composite components for the Airbus A350 family of wide-body jetliners are being machined in a pair of German-built Zimmermann FZ33 portal machining centres at a specialist subcontractor in England. Supplied by sole sales and service agent, Geo Kingsbury, each machine has a working envelope of 16 m x 3 m x 1.5 m and an installed weight of 168 tonnes.



The carbon fibre epoxy matrix parts are some of the largest composite components in the world, up to 12 metres long, 25 mm thick and weighing as much as 200 kg. The 5-axis machining cycles, involving edge trimming, face milling and drilling, take up to 16 hours across two operations.

The cycles include a significant amount of on-machine probing, first of the vacuum fixture position and then of the secured component during set-up, followed by post-machining inspection. Dimensional accuracy over a full 12-metre span is within  $\pm 0.2$  mm. All parts then go for ultrasonic inspection before being shipped to Airbus, Broughton.

The Zimmermann FZ33s are fitted with a Weiss 45 kW, 25,000 rpm, HSK-A63 spindle mounted in a slimline head that provides 220 degrees of A-axis rotation and the direct-drive rotary C-axis. X/Y/Z travels are actuated via rack and pinion drives, with



twin motors in X. Linear scales are employed for accurate positional feedback to the Siemens control. A pair of video cameras has been fitted to allow the operator to conveniently monitor the large working area.

Composite machining results in high cutting loads and rapid tool wear, so carbide and polycrystalline diamond cutters are used. Dry milling and drilling of such materials create a lot of dust, which the FZ33 removes efficiently, both via the extraction and filtration unit at the rear of the machine and through a brush enclosure around the spindle head.

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## Fast laser texturing of 3D free-form mould surfaces

A new, 5-axis CNC machine has been introduced by DMG MORI for the laser ablation of geometrically defined textures into the surface of moulds, such as those that produce plastic car fittings or electronic housings.

The machining process is more environmentally-friendly than conventional etching and offers considerable freedom of design, while at the same time ensuring a high level of repeatability. It is also capable of creating filigree cavities without the need to manufacture electrodes.



The LASERTEC 75 Shape has a footprint of just eight square metres and is therefore ideal for installation in the tightest of production environments. Its ergonomic design and door opening of 1,310 mm ensure convenient access to the machining area, which offers ample space for workpieces of diameter up to 840 mm and heights to 520 mm. They can weigh up to 600 kg, or 1,000 kg with optional tandem drive of the tilting mechanism carrying the rotary table.

Central to the machine operation are a 100 W pulsed fibre laser and 3D processing optics with F-Theta scanning lens. The laser is responsible for layer-by-layer removal of material and, in combination with the NC swivelling rotary table, offers contour-parallel laser shaping for fast, trouble-free laser texturing, even in 3D free-form areas of a mould.

Rapid traverse speeds of 40 m/min provide high dynamics for fast cycle times while stable ballscrews in the linear axes and comprehensive cooling measures ensure a high degree of accuracy. Travels are 750 x 650 x 560 mm in the X, Y and Z axes.

Control is by a Siemens 840 D solutionline which, when combined with DMG MORI's application-specific LASERSOFT software and proprietary CELOS graphical user interface, allows the machine to be integrated optimally into a manufacturer's organisation.

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# Aerospace subcontractor expands 5-axis machining

A seventh 5-axis machining centre has been installed at Preston-based, Tier-2 aerospace subcontractor, TGM, primarily to cope with increasing volumes of Airbus A350 work. Two years ago, each month the firm was delivering four port and starboard aircraft wing sets comprising 20 parts each, whereas today 10 sets per month are required and the number will climb further over the next two years.

The latest addition to the firm's 5-axis capacity is a Hurco VMX42SRTi, which has powerful conversational programming capability built into its WinMax control system. Sarah Stephens, director of TGM, says: "We already had eight 3-axis Hurco machining centres on-site, including one with an add-on rotary axis, so were familiar with the manufacturer's twin-screen, menu-driven control system and graphical user interface.

"Our operators have always found it to be user-friendly for shop floor programming and on the latest machine only the fifth B-axis that swivels the spindle head is different, so adaptation was easy. The skill sets were already in place to create 5-axis cycles involving the positioning of both rotary axes.

"We purchased extra WinMax software to run on a laptop and use it to program around 90 percent of jobs we run on the Hurcos, including the 5-axis machine, with data for the remaining work entered at the controls on the shop floor.

"Essentially, the Hurco software is an inexpensive way of preparing components for 3+2-axis machining. It is like an extra CAM seat but costs vastly less than the £50,000 purchase price and £5,000 annual maintenance of one of our top-end CAD/CAM packages alone."

Cycles currently being run on the Hurco



5-axis machine contain no ISO content generated in the CAD/CAM systems at TGM, although it could be included via the NC Merge capability in WinMax. There are no plans to put fully interpolative 5-axis jobs on the machine either, but that would also be possible with a suitable post processor.

The Hurco VMX42SRTi, with its more than one metre X-axis travel and 610 mm movement in Y and Z, is of ideal size for producing smaller parts for Airbus A350 wings, such as ribs, intercostals and brackets. All components are aluminium except for one, which is machined from titanium billet.

Over two-thirds of TGM's throughput is destined for Airbus, with the remainder going mainly into the Boeing supply chain, notably for the 787 Dreamliner. This prime's build rates are also rising, so all of the machining centres at Preston including the Hurcos are very busy.

Operations director Steve Holmes explains: "One advantage of the Hurco 5-axis SRTi design is that the fifth axis is provided by a  $\pm 90^\circ$  swivelling spindle head, so you do not lose Z-axis travel as on a machine with a trunnion-mounted rotary table. The configuration fitted well with our need to produce 40 Airbus T-pieces per month that are over 30 cm tall.

"The other thing we like about the machine is that we can ignore the flush rotary table and lay a large component



across the full 1.27 m fixed table for 3- or 4-axis machining. Alternatively, there are Op 1/Op 2 to opportunities. The machine provides a lot of versatility."

He concluded by commenting that the machine has proved reliable since it was installed in late 2016 and there have been no unscheduled maintenance issues.

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# YMT delivers flexibility and higher productivity with Detron 5-axis rotary tables

The Detron GFA series of 5-axis rotary tables from YMT Technologies has set new standards in build quality, accuracy and flexibility. Critical faces within the rotary tables are ground rather than just turned for indexing accuracy and concentricity. Engineers can also increase productivity with larger cuts and benefit from smooth braking without deformation of the table surface during braking. Detron's patented dual piston clamping technology and a fully enclosed brake drum ring operating at high pressure makes this possible.

Jason Short, from YMT Technologies, says: "The GFA series of tables delivers a small footprint allowing more and larger parts to be manufactured with the large centre bore and height of the centre line adding to the flexibility of the unit. We are finding that the most popular model is the Detron GFA-210S which is perfect for most applications. Repeatability and accuracy are important to the customer and the GFA 210S has a resolution of .001 degrees and repeatability of six to eight seconds, thanks to its high precision cross roller bearings and, tested with five continuous clockwise and counter clockwise rotations, it meets ISO 230-2 standards."

Integrated radial and axial bearings, where the spindle and bearing is one unit, add to the rigidity of the rotary table. Additionally, the dual lead worm itself uses large tooth depth resulting in a contact surface 1/3 greater than conventional worms. To ensure long service life, reliability and thermal stability, the worm is positioned



at the bottom, so that it is totally immersed in oil. Jason Short adds: "All these design features add to the quality and reliability of the Detron GFA series rotary tables and make them ideal for heavy 5-axis cutting operations."

YMT's experience with rotary tables and machine controls enables it to ensure that the Detron unit is properly interfaced to the customer's machine tool. Its engineers have the skills to set parameters and install the necessary connections and cards. The motors on the Detron GFA series are control specific, so YMT tests the installation in house before delivering it to the customer for maximum reliability and straightforward commissioning.

As well as the rotary table itself, YMT is able to supply full turnkey systems with technical advice, a range of vices and fixtures as well as automation. In fact, all the Detron GFA series rotary tables have ports in the table so that they are automation ready, giving a clear upgrade path for engineers.

YMT Technologies, was founded in 1981 and is known as one of the most progressive machine tool companies in the UK. It is constantly working to provide high quality,



technologically advanced workholding solutions at a competitive price. The company's objective is to offer affordable technology and it understands that future sales rely on its ability to service and support its customer's investments. YMT Technologies has a dedicated and highly trained team of service engineers as well as a skilled sales and applications engineering team who provide support and advice in optimising the use of the latest manufacturing techniques to achieve the maximum return on investment for customers.

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# Takumi's evolution continues as it targets the aerospace sector

Having spent the early part of his engineering career in Japan working for Fujitsu, before returning to his native Ireland to manage the company's machining operations in Dublin, Gerry Reynolds gained good experience of global manufacturing operations, which he has now put to good use in developing Takumi Precision Engineering.

While in Japan, Gerry Reynolds learned to program using G-code. There was no CAM facilities back then and, on his return, he managed Fujitsu's machine shop which, at the time, had excess capacity and the decision was taken to bring in subcontract work. This experience of operating a subcontract business from within a global manufacturing company became the lightbulb moment for Gerry and the seeds of an idea were germinated. The result was Takumi Precision Engineering, the name translating from Japanese as Artisan. Formed in 1998, Takumi supplied precision machined parts to the semi-conductor and automotive sectors, as well as providing general toolmaking capacity from its 3,000 sq ft premises. Within three years this was full to capacity and expansion and a change of direction was called for.



The booming medical device industry in Ireland presented the next opportunity for Takumi and in 2002 it relocated to its current premises in Limerick and focused its attention on developing its expertise in the medical sector, gaining ISO 9001 along the way.

Gerry Reynolds says: "This move to the first phase of our current location was a major step and gaining ISO 9001 was the first step in our journey along regulatory controls that would lead to future business and the momentum in the medical sector gathered pace for us, with companies like Stryker, Boston Scientific and Donovan Medical (Tornier) and Medtronic. At this time we began to see ourselves as we developed into what I saw as a medical device company. This was enhanced in 2005 when we gained ISO 13485 the medical device accreditation."

The medical side of the business grew and the machining capability continued to develop, but with medical representing 80-90 percent of the company's turnover, Gerry Reynolds and his team recognised that this left them exposed and that medical couldn't meet the company's ambition to grow by 10- 20 percent year-on year. Therefore in 2012 attention turned to the fledgling aerospace sector in the Republic of Ireland. Initially work came via other larger, subcontractors, but this brought

Takumi to the attention of Bombardier for approval purposes, which eventually led to it working directly for it on its C-series commercial aircraft project.

"Bombardier needed new suppliers and we responded. It was a steep learning curve, but the more we learnt the more we could take on and through investment in 5-axis machining, training and technology, we were able to take on up to 20 new parts per week, building a portfolio of not only C-series parts but legacy components as well."

The investment included 20 new machine tools in a five-year period, half of which were 5-axis machining centres. Takumi Precision Engineering also gained AS9100 and SC21 Bronze with plans to achieve SC21 Silver in 2018. Turnover now stands at 6.3 million Euro, with 60 percent of that coming from aerospace.

Gerry Reynolds now sees the majority of the growth potential for the business as an aerospace specialist rather than a medical device company, even though medical remains an important part of the business. The next phase is to further expand the factory from its current 25,000 sq ft to 35,000 sq ft during 2018.

The move to aerospace production brought new challenges and, with typical batch sizes of 5-10 off, efficiency was key.

Gerry Reynolds says: "My driver was

simple, in that we needed to reduce the number of times the machine door was opened by maximising the table capacity and multiple part loading on machines, we also spent time on cycle time reduction and here we relied on our tooling suppliers to assist us.”

WNT became a supplier to Takumi Precision, initially due to its ability to guarantee next day delivery of cutting tools, but this relationship quickly developed into a partnership, with WNT’s technical sales engineer Jerry Warren and applications engineer Shane O’Donnell willing to work alongside Takumi’s engineers to develop new machining strategies to improve cycle times and processes, as well as provide training for its operators.

Gerry Reynolds says: “Training and education are a key to our success and we encourage progression from within and as a result we have never advertised for a manager as we have accelerated people into positions of responsibility.



“The fact that WNT are willing to come in and spend time training our people on the fundamentals of tooling, both in the classroom and at the machine is a bonus for us. This is just one of the strengths of WNT, which combined with their logistical solution, which includes the tool vending machines we hold our consignment stock in, from which we get detailed reports on who has used what, on which jobs that helps manage project costs, and we still rely on the next day delivery of tools that we need unexpectedly. This combination of people, tooling and logistics are the strength of WNT.”

There is now a concerted effort among a small group of subcontractors within the Republic of Ireland to make the world aware of the aerospace capabilities of the manufacturing sector there. Takumi Precision Engineering is a founder member and instigator of Emerald Aerospace, a group of like-minded engineering businesses that are working together to promote Ireland as a centre of excellence for aerospace manufacturing. Emerald Aerospace will be the point of contact, with customers receiving one invoice, irrespective of which member carries out the work, which is a different model from other aerospace alliances.

Gerry Reynolds concludes: “For many years Ireland has had limited exposure to the aerospace sector, making growth hard to come by, but with Emerald Aerospace we have a cluster of companies with accreditation and amazing capability that means we can make the world aware of Ireland’s aerospace capability.”

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# Mazak unveils two new hybrid multi-tasking machines

Capable of both additive and subtractive manufacturing operations, two new Mazak Hybrid multi-tasking machines made their debuts at the recent EMO exhibition in Hannover.

The two new machines, which are the latest additions to the company's suite of Hybrid multi-tasking machines, allow manufacturers to quickly and easily build up part features, before employing the machine's subtractive capabilities to produce high precision parts in a single setup.

Hybrid machining has multiple advantages, including a considerable reduction in total machining process time, decreased waste material as well as less time spent on material preparation, such as forging and casting. In addition, one of the biggest advantages of Mazak's AM technology is the capability to add different material onto a substrate. This gives machine tool users the opportunity to manufacture components which may not have been previously possible, by coating or adding different material onto an original component.

The result is a significant reduction in production time, as well as the number of machines and operators required for a production process; and the added potential to perform repair-type operations on high-value components.

The VARIAXIS j-600/5X AM, which made its European debut in Hannover, employs a Wire-Arc AM (Additive Manufacturing) head on a 5-axis vertical machining centre to enable high-speed additive manufacturing.

The Wire-Arc AM torch is mounted on the machine's headstock to deposit material layer-by-layer and grow near-net-shape 3D forms. The system quickly deposits material



The VARIAXIS j-600/5X AM employs an AM head on a 5-axis vertical machining centre to enable high-speed additive manufacturing



The INTEGREX i-300S AM is the latest addition to Mazak's INTEGREX AM series of machines

due to the use of wire instead of metal powder.

The VARIAXIS j-600/5X AM is capable of high accuracy and productivity from the 12,000-rpm main spindle and the wide B-axis spectrum of rotation (+90 degree to -120 degree). The machine is equipped with a high rigid and accurate structure, utilising roller linear guides on all linear axes and roller gear cams on both rotary axes.

Equipped with SmoothX, the world's fastest CNC, the VARIAXIS is easily programmable for both the machine and the welding automation. The j-600/5X AM is well-suited to a wide variety of machining applications, including the production and repair of marine propeller parts, moulds, dies and oil-drilling components.

Alongside the VARIAXIS j-600/5X AM will be the latest addition to Mazak's INTEGREX i-AM series of machines, the INTEGREX i-300S AM, which brings the Mazak philosophy of DONE-IN-ONE machining into hybrid manufacturing.

The INTEGREX i-300S AM uses multi-laser metal deposition, during which the lasers simultaneously melt the base material whilst the powder, which is supplied through the nozzle centre, enables the machine to produce a metallurgical bond with different types of metal. The advantage of multi-laser metal deposition is that it offers a stable supply of metal powder which efficiently welds to reduce the effect on the base material.

Multi-laser metal deposition also ensures the prevention of powder supply deviation due to gravity when the AM head is tilting. Therefore, it is ideally suited to developing complex shapes and fine modelling, such as coating for an impeller or fine modelling on a roll die. The multi-laser metal deposition AM head has a new configuration, and is driven by a gantry system, enabling greater accuracy and efficiency when operating in large processing areas.

The machine's subtractive manufacturing capabilities are also best-in-class. It has greater workpiece capacity than any other multi-tasking machine in its size range, and high performance is delivered by 4,000 rpm main and secondary spindles.

For optimised interoperability in the face of growing Industry 4.0 adoption across the manufacturing sector, all Mazak AM machines can be easily integrated into a customer's current or future connected manufacturing systems. Operating on SmoothX CNC, Mazak's AM portfolio can provide real-time production monitoring and analysis, coupled with improved scheduling, to ultimately deliver shorter lead times, reduced in-process inventory and lower indirect labour expenses.

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# Precision profile centre developed for micron accuracy and repeatability

The Mitsui Seiki PJ812 Precision Profiling Centre is designed to provide ultra-precision boring and contour machining through the company's MAMS (Mitsui Accurate Milling Support) thermal monitoring system where accuracy and repeatability within +/- 1 micron and an accuracy of programmable feed rate consistency that is within 0.0001 mm.

The Mitsui Seiki product range is supplied and serviced in the UK by 2D CNC Machinery, based in Hinckley. The 3-axis CNC ('Mother Machine') designated, vertical jig mill type has been developed for processing highly demanding workpieces typically found in the optical, medical, aerospace and specialist mould and die sectors.

Capacity in X-axis is 1,200 mm, Y 800 mm and Z 500 mm with a table working area of 1,200 mm by 800 mm. The mechanical design focus was on the planer-style symmetric construction to maximise rigidity to achieve super high-grade tolerance levels

based on hardened and ground tool steel slideways. The machine also incorporates Mitsui Seiki's latest 'sliding mechanism' development, where contact slideway elements not only enhance levels of acceleration but also minimise stick-slip, which enables claims for the Z-axis having some six-times greater static rigidity than more conventional Z-axis machine tool designs.

A thermal compensation system reduces any influence of temperature change or temperature-generated displacement by 60 percent on workpiece accuracy, due to integrated sensors housed on the machine faceplate and within the spindle. Further gains are made with the MAMS multi-sensor system on the Z-axis, which reduces thermal growth and deflection by 30 percent. In addition, to help maintain stable rates of axis feed within 0.0001 mm that contributes to the holding of high orders of surface finish, a centralised cooling system is incorporated within the sideway lubrication



Mitsui Seiki PJ812 Precision Profiling Centre developed for highest precision 3-axis boring and contour machining

as well as the core of each ballscrew to stabilise the precise operation of axis feeds.

The Mitsui Seiki PJ812 has direct drive spindle options of 50-taper, 30 kW, 10,000 revs/min up to an 18 kW, 30,000 revs/min with 40-taper. Rapid traverse rate is 24 m/min. Control is by Fanuc 31iM-B with a 40-tool magazine as standard.

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# Die casting company installs two more high-speed machining centres

In medium volumes, there is little difference between the cost of producing machined castings in China and in the UK

Zinc and aluminium high-pressure die casting specialist RD Castings has used Japanese-built, high-speed, twin-pallet machining centres from Brother since 1989 and currently has nine of them adding value to its products in two machine shops in Mildenhall, Suffolk. Since the mid-90s, the 30-taper machines have replaced manual milling, drilling and tapping, which was both labour intensive and subject to quality variation.

Running the company are siblings Anthony and Michael Pateman, who were interested when Brother's UK agent, Whitehouse Machine Tools, suggested they see a demonstration of the machine manufacturer's new ISO control with 12-inch colour LCD screen, the CNC-C00, a significantly faster and more user-friendly CNC system fitted to its latest machines.

After they visited the agent's Kenilworth showroom and technical centre at the end of 2016, they came away not only with up-to-date information on the new control's capabilities, but also having ordered another Brother machining centre, a Speedio R650X1 with Nikken rotary 4th axis. It was not their intention before the visit, but the machine was so productive and such a good fit for RD Castings' needs that they placed the order on the day and invested in a second identical model within six months.

Numerous facets make the machine particularly applicable to machining light castings, one being its outstanding speed. Workpiece changeover is completed



entirely within the 3.4 second rotation of the twin-pallet Quick Table, as the 21-pocket magazine's 0.9 second tool change time, 50 m/min rapids in XY and Z, and rotation of the 4th CNC axis are carried out simultaneously.

The first tool is ready to cut the next component immediately it arrives in the machining area and little time is wasted on each subsequent exchange of the cutter due to the rapid tool-to-tool time and spindle acceleration from zero to 16,000 rpm in 150 milliseconds, with similarly fast stop time.

Michael Pateman says: "The speed of tool change on the R650X1 mirrors that of our Brother 324N and R2A machine models, where the tool carousel encircles and travels with the spindle, which does not have to move away to pick up a new cutter as on the Brother TC32A and 32B machining centres that we also have on-site.

"It results in very high productivity that is enhanced by faster processing of existing programs in the new CNC-C00 control. For example, we recently reduced a 3.5-minute cycle by 20 seconds with no change to the original program. If we are machining say 20,000-off parts

annually, the saving runs into thousands of pounds."

Anthony Pateman pointed out another advantage of the R650X1, namely the generous axis travels of 650 x 400 x 305 mm in X, Y and Z. The table accepts RD Castings' 500 x 350 mm base plates on the trunnion fitted to both machines, allowing multiple components to be fixtured for 2-axis and 3-axis machining, relieving the load on the 324Ns and R2As which are always filled with work.

Anthony Pateman says: "There is a trend towards larger castings these days and we have just installed a 500 tonne casting machine to meet the requirement. In order to machine them, the ability of the R650X1 to swing our 400 mm diameter parts in the rotary axis means that we are often able to



finish these bigger castings in one hit and save on a second setup operation, which hugely decreases cost of production."

To underline this comment, he pointed to a casting of about the size that used to need a second operation but is now machined in one 4-axis process, saving 70 pence per part.

Simon Hale, CNC machine shop manager, stated that productivity of another part, an aluminium die cast housing for the rail industry, has been nearly doubled using the larger machine compared with the other Brother models with similar tool carousels. 17 castings per hour were drilled and tapped using 12 tools on the latter machines, whereas using a trunnion fixture on an R650X1, 32 parts per hour come off the machine after each pallet rotation and just eight tools are needed.

The increase in output is partly because, by routing coolant at the updated 30-bar pressure on RD Castings' latest machines through an indexable-insert drill rather than employing a twist drill, it is possible to produce larger holes above 18 mm diameter in one



spindle movement, rather than having to spot and then peck drill the holes multiple times.

Michael Pateman asserts that manufacturing costs are increasing in Asia while the lower pre-Brexit value of the pound is helping UK competitiveness.

He concludes: "By employing ultra-high-speed machining techniques on 30-taper rather than 40-taper machines, with extensive use of polycrystalline diamond inserts clamped in dynamically balanced toolholders, the cost of producing a casting is now about the same in Mildenhall as it is in China and we are winning back business as a result.

"The latest Brother Speedios with their larger working envelope have added considerable versatility to our shop floor, as they can economically machine anything from the simplest, smallest casting up to the largest and most complex. Productivity is also up due to the faster control and by allowing more flexible production planning."

"All of our Brother machines work flat out eight hours a day and their speed, accuracy and reliability are fantastic. Coupled with the high level of support from Whitehouse, it has been an unbeatable package for us."

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# Iconic makes its move into machining with XYZ

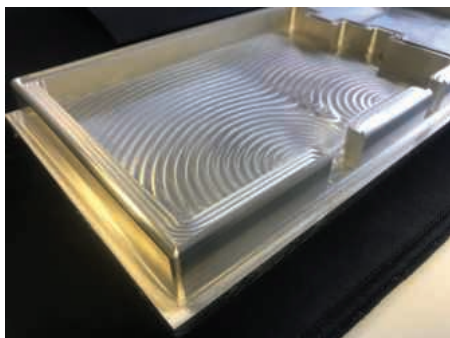
With 18 plus years of experience in the manufacturing sector, working for many companies in both design and machining roles, Jamie Clare decided it was time to do things for himself and Iconic Engineering Solutions was born. Initially he was providing a 3D design service for a broad range of customers that included airship development, motorsport fluid distribution systems and classic cars.

Jamie Clare explains: "Having worked for others for so long, I realised that I could make a go of this myself, so I put a plan together, approached the bank for some capital and invested in high-end computers and software, including 3D CAD (Solidworks), FEA, CFD and 3D printing. That was four years ago, and the design work has continued to grow, with a good base of customers from diverse industries."

Throughout these four years he was constantly being asked by his customers if he knew anyone that could machine the parts he was designing. While passing on these enquiries to local machine shops, Jamie Clare also kept tabs on them, and realised that he was letting good business slip through his hands.

He explains: "I tallied up the machining work that I was passing on and, for one customer alone, I calculated that it equated to around £50,000 a year in potential business I was missing out on."

As Iconic Engineering Solutions was now operating from larger premises, shared with one of its customers, Jamie Clare had the room to develop his machining ambitions. With already having experience of XYZ machines and the ProtoTRAK control, after setting up a machine shop for a former employer, this was the route he took for himself. Having researched the current XYZ range and choosing to stick with the ProtoTRAK control, he decided that the XYZ



LPM vertical machining centre would make the ideal starting point. Taking advantage of a good deal at an XYZ Open House, he put the deposit for the machine on his credit card and purchased the machine in June 2017, along with the optional offline programming package.

"My knowledge of the ProtoTRAK control and an existing relationship with whom I had worked with on the previous machine shop project some years ago, gave me the confidence to move forward. Talking with XYZ about the machine, I was assured that it ticked off many of the boxes in terms of capability for the work I had planned for it. Put simply, the machine meets my requirements. As a small dynamic business, it is all about maximising the available time, so I try not to compromise, as the minute you have any issues it is lost time."

The bulk of the parts machined by Iconic Engineering Solutions are from billet material and the ease of setting the XYZ LPM machine with its Jergens Ball Lock equipped table with pre-designated datum points, make setting up much quicker. Additionally, the ProtoTRAK control's background editing function allows users to program and set up the next job whilst the machine is still running. Other standard equipment and features include a 15 hp,



8,000 revs/min, BT 40 spindle, 16 position toolchanger and a 900 mm by 500 mm table, allowing multiple jobs to be set at once, with axis travels of 785 x 470 x 530 mm.

Having taken this first step into machining as Iconic Engineering Solutions, Jamie Clare is already looking to the future and, in partnership with his customer and landlord, discussing the way forward to expand his machining capacity. With milling taken care of, the next step will be turning and he will stick to his no compromise principles by investing in the right equipment for his workload. This will lead to live tooling and Y-axis capability with the XYZ Compact Turn 65 LTY in his sights.

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## Ajax introduces new Super Turn range of machines

Ajax Machine Tools in Lymington, Hampshire has always been known for its good value CNC flatbed lathes. The company has further enhanced its reputation with a new heavier range called the Super Turn. The machine still comes with the very easy-to-use Fanuc Turnmate I touch screen system.

Now with a heavier construction and new design, this range of machines will be welcome in any company. New features include independent hand wheels saddle mounted for ease-of-operation, along with controls and E Stop for safer use. The new guard design allows ease-of-access for bigger jobs.

Further benefits include: removable rear guards for ease of cleaning, better swarf management at the rear, removable coolant tank for ease-of-cleaning, a choice of four way or eight station turrets, Camlock or DIN spindles and a wide range of high quality chucks, steady's and accessories. Other options include the option to upgrade the control to Manual Guide I or Siemens 828D with Shopturn.

The range extends from 400 mm swing on the AJST400, with 1,000 mm between centres, to 500 mm swing on the AJST500 with 750, 1,250 & 2,000 mm between centres and 600 mm swing on the AJST600 with 750, 1,250, 2,000 mm between centres. Spindle bore sizes range from 52 to 86 mm

Programming times are greatly reduced due to the simple cycles that any turner can understand very quickly and easily to make complicated parts in minutes. The control still also has full ISO G Code programming capability for offline CAD CAM operations that can be entered from RS232, USB or flash card systems. This ensures a great all-rounder in the field of Teach CNC lathes.

Ajax Machine Tools International Ltd, is now recognised as one of Europe's leading suppliers of both conventional and CNC Machine Tools. Apart from continuing to service a wide and diversified range of British-based companies and institutions, it is also exporting to over forty countries worldwide.

Within the export division, both management and staff have many years'



experience in all aspects of International trading, which coupled with their commercial and technical expertise, entrepreneurial and positive approach, creates a highly successful combination, capable of meeting the ever-increasing competitive demands encountered in today's international market place.

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# MAPAL celebrates record breaking performance in 2017

As a subsidiary of the leading German PCD tooling group, Rugby-based MAPAL UK witnessed growth in the region of 30 percent in 2017. Explaining the growth and the ongoing evolution of the business, Wayne Whitehouse says: "Over the last five years we have enjoyed growth in the region of 45 percent. The jump in 2017 sales revenue is credit to a number of factors. Firstly, we have long been known as industry leaders in the automotive industry. This has been credit to the performance of our extensive PCD product lines, multi-stage tooling solutions and the technical experts we have to cultivate our service partnerships with world leading OEMs, particularly in the



engine manufacture arena. However, the long-term predictions for the combustion engine and the exceptional performance of the UK aerospace industry has led MAPAL UK to re-align its business strategy. The 30 percent growth in 2017 is the first sign of this re-alignment."

To sustain this growth, MAPAL has made a significant investment in staff, equipment and infrastructure. Wayne Whitehouse continues: "We invested over £1 m in new machine tools and metrology equipment in 2017 and we are planning an additional £1 m spend in 2018. As well as the capital investment that is generating a 50 percent increase in PCD tool manufacture, the MAPAL Group has re-structured its global manufacturing processes. With a focus on streamlining the business, we have



restructured our manufacturing facility with air control, installed OPUS programming software and we are upgrading the tool management facilities; all with the aim of reducing the cost-per-piece production costs and essentially customer costs."

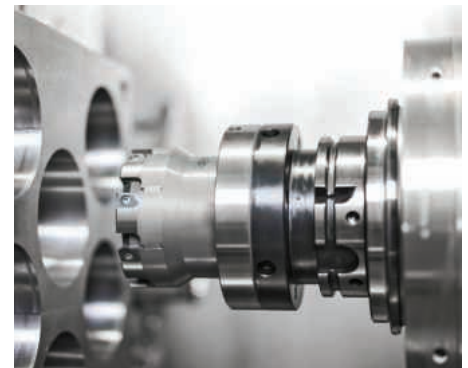
The comprehensive OPUS system will give MAPAL UK access to a tool database suite with an unprecedented number of tool production programs and designs from the global system. Additionally, MAPAL UK will integrate the tool programs developed in the UK to the new tool data platform. Integrating a globally uniform tool design and programming database with globally standardised production machines and methodologies is already helping the company to enhance lead-times and reduce programming times by over 30 percent.

Wayne Whitehouse continues: "Facilitating growth through new technology investments and streamlining exercises will yield long term benefits for MAPAL UK and its customer base; however, the implementation is showing instant results. To support our business and capacity growth, we have now invested in a new vehicle to provide a collection and delivery service for customers in the Midlands. Not only will this service enhance lead-times and generate consistency for our local re-grind and tool servicing customers, it will free-up the valuable time of our sales and technical engineers; as we don't want our technical experts involved in the supply chain.

"Recruitment is also a key aspect of our business and in the last 12 months we have seen two apprentices complete their training. As these apprentices receive their indentures, we will be actively recruiting the next batch of trainees. For the first time

ever, we have also employed a general manager at Rainey, our wholly-owned Ireland subsidiary. Eamonn Orchin will be a great addition to the team and he will eventually make the transition to managing director when Roy Douglas retires."

"Another first for MAPAL in 2017, was the appointment of our first graduate engineer. Our new graduate has an aerospace engineering masters degree and he will work directly with Dick Arnold, our experienced aerospace project manager. This emphasises the strategic importance MAPAL UK is now placing on the aerospace sector.



Wayne Whitehouse concludes: "As a Group, MAPAL is already working with many of the world's leading aerospace OEMs. The aim for the UK business is to build upon existing OEM and subcontract relationships, target niche pockets of the aerospace industry with our unique standard product lines and tailored tool design solutions and also emulate the success our European counterparts have achieved with the very latest product lines that were launched at EMO in September. Many of these solutions will receive their UK exhibition debut at MACH 2018 and we expect the new aerospace product lines to make a significant impact at the show."

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# Get a first-class ticket to productivity

High-feed side milling cutters boost ISO S material machining, ideal for aerospace industry

To enhance milling performance on ISO S materials, cutting tool and tooling system specialist Sandvik Coromant is introducing a series of end mills featuring unique geometries and grades. The CoroMill® Plura HFS (High-Feed Side milling) ISO S cutters deliver reliable and productive results on workpieces made from titanium and nickel alloys, bringing benefits to both aerospace engine and frame applications.

To help address the predicted growth in aerospace business in the coming years, the CoroMill Plura HFS range comprises two end-mill families optimised for titanium alloys and one for nickel alloys. As chip evacuation and heat are specific challenges when machining titanium, Sandvik Coromant has developed a solid version for normal chip evacuation conditions, and another featuring internal coolant and a new cooling booster, patent pending, for optimum swarf and temperature control.

The end mills for titanium are available in GC1745 grade, which is based on a tough, fine-grained, sub-micron cemented-carbide substrate with sharp, controlled edges for very tough milling operations. Furthermore, a new multi-layer coating that contains silicon provides excellent wear resistance and low thermal conductivity. The geometry of the cutters is based on a six-flute concept with no centre cut and uneven tooth pitch. Additionally, the core dimension has been optimised for higher stiffness in titanium alloys, while the corner radius, rake angle and relief are all designed specifically for machining these challenging materials.

For nickel alloys, grade GC1710 is deployed, which also features sharp, controlled cutting edges. A hard, wear-resistant, fine-grained substrate is optimised to resist high working loads when machining hard, highly adhesive, work-hardened materials such as aged Inconel 718. Here, a new coating produced with innovative HIPIMS (high power impulse magnetron sputtering) technology also offers adhesion reducing properties to avoid the formation of BUE (built up edge) and increase tool life.

Tiziana Pro, global product manager for solid end mills at Sandvik Coromant, says: "The new cutters are designed to offer



The new CoroMill® Plura HFS ISO S cutters from Sandvik Coromant are ideal for machining aerospace components made from titanium- and nickel-based alloys



high-feed side milling with large axial depths of cut (ap) and low radial depths of cut (ae), along with a controlled maximum chip thickness, so that the cutting forces are managed and provide a smooth cutting action. The result is two-fold: increased productivity provides higher output, while greater tool life and reliability reduces scrap rates in what are typically high-value components. Further customer benefits include reduced tool cost per component and greater safety levels."

Target aerospace components include titanium wings and pylon parts, as well as engine cases made from Inconel 718. Applications in sectors such as oil and gas, medical and motorsport, where titanium and nickel alloys are becoming increasingly prevalent, will also benefit.

To highlight the potential gains on offer, a customer trial was performed involving an LPT (low-pressure turbine) case made from aged Waspaloy 420 nickel-based alloy. Using a horizontal machining centre, axial depth of cut was increased and radial depth of cut reduced (high radial forces are known to create deflection issues). Comparing a 12 mm diameter CoroMill Plura HFS end mill against a competitor cutter of the same size, metal removal rate increased substantially, leading to an impressive 198 percent increase in productivity. As a result of this success, the customer committed to ordering the new cutters from 1st October 2017.

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the

forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3,100 patents worldwide, employs over 8,000 staff, and is represented in 150 countries.

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## New, innovative packaging solutions from rose plastic

Quality tools are expensive, therefore it is even more important to provide quality protection to prevent the cutting edges and tips from damage. rose plastic has introduced two impressive new products to the market, ProtectiveCap and TwistPack Plus. The ProtectiveCap product is a new, streamlined product concept that simplifies ordering and inventory levels. It has a reduced number of sizes and one size can accommodate multiple tool diameters. The available range provides protection for tools of various sizes ranging from 3 mm to 20.5 mm in diameter. Its flexible material provides easy assembly and removal. It offers ideal protection for cutting tool tips and edges.

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7mm	100mm	0.045	0.00045	0.0025
10mm	100mm	0.075	0.00075	0.004
15mm	100mm	0.15	0.0015	0.0075
20.5mm	100mm	0.25	0.0025	0.0125

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The new TwistPack Plus from rose plastic is the latest version of the world's most popular packaging for precision tools. The original TwistPack, a universal, two-part plastic tube, was a packaging solution that made history and it was first launched in the 70s. The product has evolved over the years, making it one of the most successful products for packaging precision tools. It is utilised by thousands of customers around the world.

TwistPack was so successful that it has had many imitators. The original concept has since been adapted with many features now significantly enhanced. rose plastic is always looking for ways to improve its tried and tested products.

TwistPack Plus features a new locking system which enables quicker opening and closing and protects your product even better. The modular concept offers maximum application flexibility. In short, TwistPack plus is the new original.

For decades rose plastic has been engaged in the development and production of special plastic packaging. Closeness to customer, a skilled and motivated workforce and a tightly interlaced network of perfected processes are the components for innovative packaging solutions of outstanding quality and for optimum service.

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# Poly – poly – or what?

How new super hard cutting materials revolutionised machining

Horst Lach, managing director and CEO of LACH DIAMANT recently agreed to write an ongoing series of articles about the development of diamond and CBN tools and grinding wheels in modern industries. The occasion: LACH DIAMANT's 96th anniversary in the run up to GrindTec and AMB 2018.

Horst Lach is known as a true industry veteran and we are delighted to have this pioneer of technology share some insights from 55 years of professional experience in the diamond tool business.

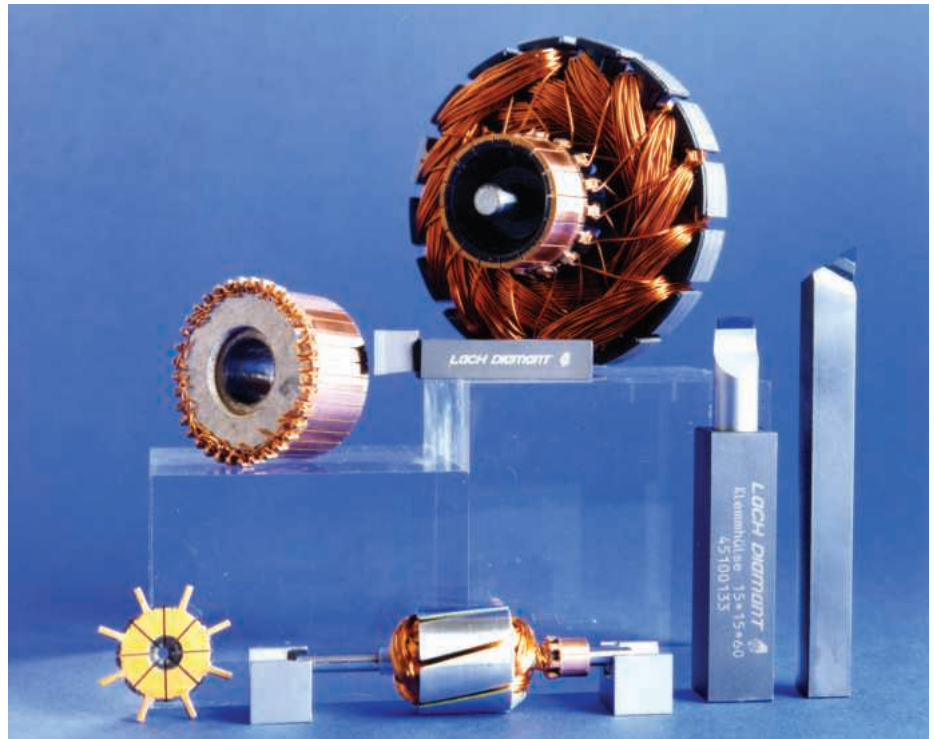
In this article, Horst Lach looks back to the time between April 26th and May 4th of 1973 when new super hard cutting materials revolutionised machining:

The introduction of our Borazon™ CBN grinding wheel was still in full swing when I received information from General Electric in 1972 that a new cutting material would be coming soon. What could it be? Naturally all of us were curious. After all, it was the run-up to the 1973 Hanover Trade Show in April. A new cutting material meant another chance to showcase another innovation, like Borazon, as one of the first companies, or the first, worldwide. After successfully introducing the new abrasive, I expected preferential treatment compared to other competitors. Answers to my requests for first samples or test materials were delayed. It was already March 1973. Despite the secrecy of General Electric, I managed to pick up on two little clues: "Compact and poly."

### Poly - poly - or what?

I was fascinated by the possibilities that seemed to open up on an almost daily basis in regard to the new Borazon CBN grinding wheels. At first, I thought that "compact and poly" might refer to compressed cubic boron nitride. That would have been great for LACH DIAMANT, since we already had a lot of experience with the Borazon CBN grinding wheel: grinding of high-alloyed hardened steel and HSS; compact CBN; turning instead of grinding – fantastic.

As it happened, we then also received a request from DEW (German Edelstahlwerke). They wanted to know whether LACH DIAMANT could offer any



tools for machining DEW's material "Ferrotitanit". The new and compact CBN material was so exciting for DEW's management that two of their CEO's paid us a visit only a few days later.

They must have been very disappointed when I had to tell them about three weeks later that we would use not a CBN material but a polycrystalline block of synthetic diamonds. The term "PCD", polycrystalline diamond, was born. To be honest, I was a bit disappointed too, at first.

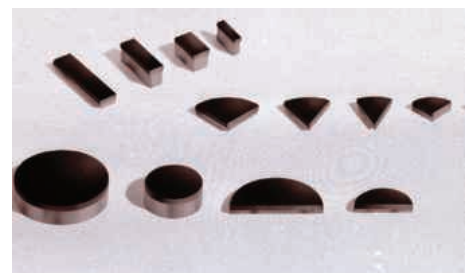
### Disappointed, but then ...

Compact CBN would have been something to work with immediately. But a "diamond block" as substitute for natural diamonds? At the time, in April 1973, we employed about 20 grinders for natural diamond for the production and service of natural turning diamonds for customers like Bosch, AEG, Siemens, Menke and others. Should we now switch completely to synthetic diamond blocks? We would have to find new customers. But how and where? At the time, the only way to find new potential customers was via the ABC of German Industries, a handbook of national companies.

I found one Swiss commutator

manufacturer named "Kautt & Bux". I called them and found out something surprising: Commutators are not turned, but ground in a very time-consuming procedure. At least that was the case in 1973.

Out of pure instinct, I spontaneously explained that they could save several minutes of grinding time if they would instead replace this procedure with turning using the new PCD turning steel; they were impressed and promised to visit our stand at the Hanover Trade Show. At this point, my suggestions were only of a theoretical nature, since we did not have the material yet. But in the hope of a timely delivery for the production of the first PCD turning steel, we planned to set up a Weiler turning machine at our stand in order to do a demo presentation on it.

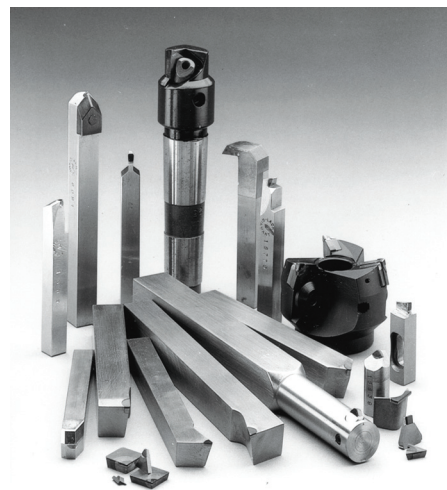
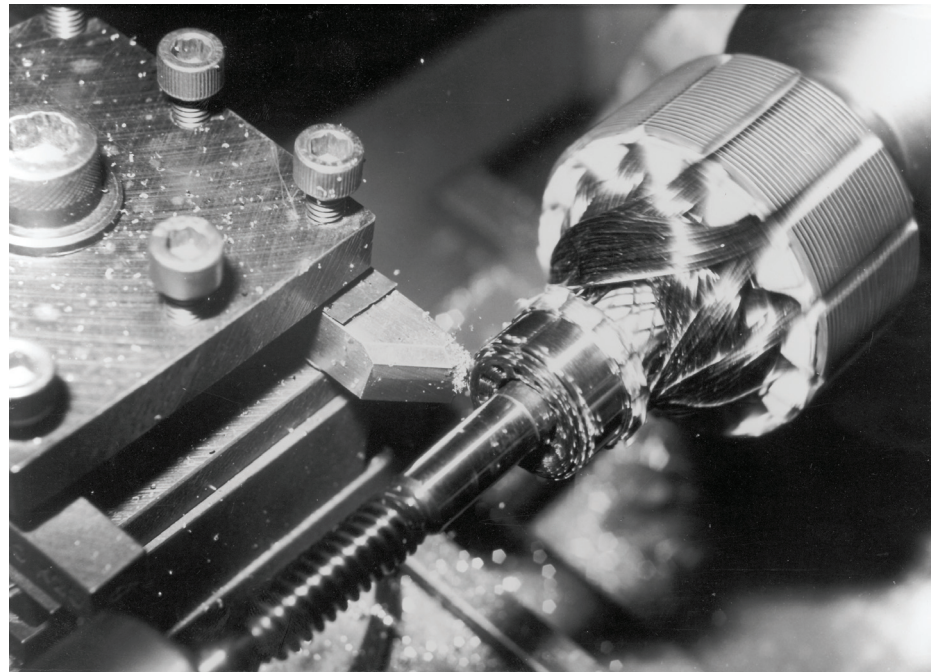
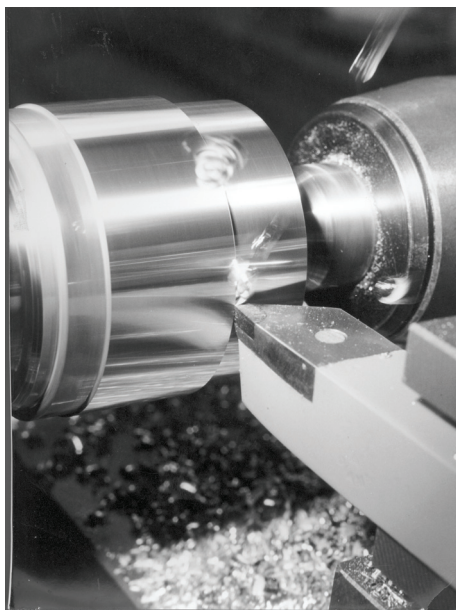


After General Electric had published the first announcements that the new material would allow even for interrupted aluminium cutting, we decided to demonstrate with a "blemished" aluminium round part with several cross bores. Natural diamonds are the hardest of all materials, however very sensitive to shock, especially during interrupted cuts! However, the new material promised not to be affected by this.

### Three critical days

Finally, the long-awaited PCD material arrived as 90° and 60° segments which had apparently been cut out from a 3.2 mm blank. The visible PCD diamond layer was about 0.3–0.4 mm thick and connected via a carbide support, so that the cutting edge could be further manipulated by soldering. It was now Friday, exactly three business days before the start of the Hanover Trade Show. I proudly presented the first PCD to Kurt Wagner, manager of our grinding shop and a highly talented diamond grinder who had mastered his art as a diamond specialist at a Swiss manufacturer for diamond tools.

After careful inspection and several grinding attempts on a cast grinding wheel that was apparently used for natural diamonds and coated with diamond dust, he announced: "Sir, usually we do everything, but this stuff is so beastly – there is nothing we can do." I thought, that this was probably the end of it. But then I thought of our Simon steel grinding machine (L15). We had purchased it for our cooperation with Simon, Neu-Isenburg, a distributor of resin and metal bond diamond wheels. I suggested: "Try it with the Simon machine, with the cup wheel."



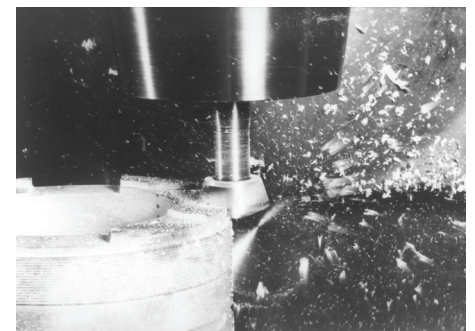
To our great astonishment, the very first grinding attempt with a resin bond diamond grinding wheel proved already to be very promising. However, we still had to spend several hours to get the desired cutting geometry.

At 9.00 am on the first day of the trade show, our driver arrived at our stand and delivered the first PCD tool which would later be known under the trade-marked name "dreborid". The driver delivered additional turning steel, on Wednesday and Thursday, until we explained to him that "this stuff will hold long enough, we do not need any more tools."

Our visitors could hardly believe that this "little diamond cutting edge" could machine the perforated aluminium turned part without any "rumbling". We became more and more confident and increased the feed with every attempt making use of the

maximal edge width. We only succeeded to "kill" our PCD cutting edge on the very last day. It could not cut an empty piccolo bottle which we had boastfully inserted.

By the way, the technicians of Kautt & Bux were there as well and very excited about the demonstrations. A first key customer for serial use of dreborid PCD tools was found, so Kautt & Bux can boast to be the first company worldwide using polycrystalline diamonds in production.



This was a stroke of luck for LACH DIAMANT, because in the process of turning the surface of copper collectors, we also learned how polycrystalline diamonds can be successfully used with other composite materials. Success followed success and a new era of machining of non-ferrous metals and synthetic materials had begun.

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# Tungaloy introduces turning line for heat resistant alloys

### Tungaloy turns out a grade for hard turning

The Tungaloy Corporation has an impeccable reputation for its turning lines, something that has now been enhanced even further with the arrival of the new AH8000 insert series. Developed as part of the TungTurn line from Tungaloy, the new AH8000 Series demonstrates unsurpassed performance levels when machining heat resistant alloys.

The new AH8000 Series outperforms competitor turning lines with regard to tool life and longevity, productivity and cutting performance, especially when faced with difficult machining conditions. The incredible reliability and performance is credit to the composition of the grade that incorporates newly developed substrates, enhanced adhesion strength, a Nano multi-layered AlTiN coating with a high Al content and Tungaloy's exclusive PremiumTec Special Surface Technology.

What all this means for the customer is an insert grade that is at least 20 percent harder than alternate grades, a feature that prevents the development of micro-cracking and premature tool failure. With stable and extended tool life guaranteed, the bonding of the substrate prevents notch wear and further extends performance parameters when machining heat resistant alloys. Under test conditions on a variety of inconel, titanium and alternate aerospace grade alloys, the Tungaloy AH8000 has more than quadrupled tool life whilst drastically reducing machining times.

These astounding performance characteristics are a combination of the AH8000 grade composition and the extensive range of innovative geometries and chip breakers that are available. Within



the AH8000 Series is the AH8005 grade for continuous machining at higher spindle speeds and the AH8015 grade that is extremely hard and durable for interrupted cutting applications. As well as the two grade options, Tungaloy has developed its HRM chip breaker designation for finish to medium cutting whilst the HRF breaker is the premium choice for finish turning operations. The HRM chip breaker has rake face protrusions and an optimised rake face geometry that combine to reduce contact between the tool and workpiece as well as generating low cutting forces and stabilising chip control. Adding to these negative insert chipbreakers, Tungaloy has now developed a positive insert line with new PSF, PSS and PS chip breakers.

This impressive new turning series is available for a vast range of applications with an extremely diverse line of insert shapes and sizes available to suit most

Tungaloy turning toolholders. The diversity of the AH8000 Series includes a 35, 55 and 80-degree Rhombic insert, a square, triangular and trigon insert (90, 60 and 80 degree) designation as well as a round insert range. Furthermore, the new AH8000 Series is now available for milling applications on difficult to machine alloys.

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

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## Dramatic productivity increase

New Secomax CS300 ceramic inserts and RN/RP cutter bodies increase productivity by up to 800 percent when machining nickel-based heat-resistant super alloys (HRSA)

Seco Tools now provides manufacturers with Secomax™ CS300 ceramic inserts and new RN/RP cutter bodies which, when used in combination, dramatically improve productivity levels when machining nickel-based heat resistant super alloys (HSRA).

The new cutters can increase productivity by up to eight times over their standard carbide milling counterparts and are ideal for machining a wide range of precision components, including turbine parts, features etc, used in the aerospace and power generation sectors.

CS300 SiALON ceramic inserts provide high notch wear resistance, toughness and reduce the effects of thermal shock. They also optimise flank wear resistance when higher cutting speeds are employed and enable feeds from 0.05 – 0.15 mm per tooth to be used. Taken together, these performance attributes of CS300 inserts help reduce the cost-per-part, increase

output, reduce lead times and lower energy consumption.

### Seco's new RN/RP cutter bodies deliver similar impressive performance

The cutter bodies are hardened and nickel-coated for increased reliability and its design and manufacture also helps reduce chip friction and provide improved performance in high temperatures.

Wedge clamping ensures secure insert locking and optimises chip evacuation whilst the bodies' internal air cooling channels contribute to long and consistent tool body life.

The new range includes cutter bodies with RP 1204, pocketing in diameters from 32 to 50 mm. Cutters with RN 1207 and RN 1204, facing are available in diameters from 32 to 125 mm.

Seco is one of the world's largest providers of comprehensive metal cutting solutions for milling, stationary tools,



Seco Tools now provides manufacturers with Secomax™ CS300 ceramic inserts and new RN/RP cutter bodies

holemaking and tooling systems. For over 80 years it has been more than just a cutting tool provider. It develops and supplies the technologies, processes and support that manufacturers depend on to maximise productivity and profitability.

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# Guhring forms a new threading line

Regarded as an industry benchmark for its extensive hole-making and threading product lines, Guhring used the recent EMO exhibition in Hannover to further enhance both its reputation and product portfolio. The arrival of the next generation of PIONEX thread formers incorporate a new design that requires 30 percent less torque than previous product lines.

The R&D engineers at Guhring have optimised the groove, the polygon shape and the surface preparation of its threading series and the result is the extraordinary new PIONEX tapping line. A revolutionary geometric change in the tunnels of the thread former optimises the contact between the tool and component surface and drastically reduces the cutting forces with an extremely smooth cutting action.

This enhanced design reduces the cutting temperature as well as the torque and the axial forces by up to 30 percent. The result for the end user is a massive improvement in tool life, improved reliability and consistency as well as improved thread quality and precision.

The PIONEX taps are manufactured from a powder metallurgical steel compound that has an extremely high wear resistance whilst a special TiCN surface treatment provides durability. The combination of high wear resistance and durability is complemented by a new Guhring polishing technique that makes the surface of the thread formers smoother and more polished than ever before. The result of these enhancements further prolong tool life and enhance surface quality.

The new developments with the PIONEX geometry are noted in the groove depth and width that are both increased to transport more lubrication to the focal area of the thread former. Another key feature of the new PIONEX is the innovative shape of the polygon. By re-aligning the geometry of the decisive operating radius that is the focal contact point between the tool and the workpiece, the torque requirement and the stress on the tool is significantly reduced.

The new PIONEX Series from Guhring is available in all major thread types and this includes metric, metric fine, UNC, UNF and pipe thread. In addition, the PIONEX covers diameter tolerances of 6HX 6GX, the form C and form E. To match the extensive diameters and thread forms available,



Guhring has also made the PIONEX available with through coolant with the option of axial and radial coolant channels.

Guhring Ltd, founded in 1973, was the first subsidiary of the Guhring Group. Initially starting as a sales, stocking and distribution operation Guhring Ltd has now grown into an established UK manufacturing company with capability to produce special tools on short deliveries and regrind/recoating service.

Guhring Ltd employs a team of field technical support engineers and in-house design and application engineers who are focused on offering customers with a continuous stream of the very latest in cutting tool technology. The need to support manufacturing is the main goal and this is achieved by ensuring that optimised tools are designed, developed, manufactured and applied.

Guhring can offer all the above from the company's UK operation which is complemented by an extensive stock holding of standard and special products. With a range of 1,620 standard product in over 44,000 sizes the aim is to provide the ideal tooling solution in the fastest possible time.

Founded in 1898, Guhring has successfully evolved to take its place as one of the leading manufacturers and suppliers of rotary cutting tools. Guhring is a German based private limited company, employing approximately 6,000 people in manufacturing, service and sales operations around the world.

Guhring offers customers a complete tooling 'package', including the well-established manufacture and supply of



rotary cutting tools in addition to full product design, development, tool holding systems, tool management, tool regrinding and recoating plus stockholding.

Through its raw carbide production, machine tool and equipment divisions and coating technology including research and development, Guhring is able to harmonise such core expertise through continuous improvement.

The aim for the company is to provide total customer satisfaction and this is achieved by providing optimal products when required, highest productivity, excellent economic efficiency and the latest in tool technology to ensure that new opportunities in efficiency are always achieved.

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## Shark Line taps given extra bite

Dormer Pramet has expanded its Shark Line program of material specific taps with two new designs. With its unique combination of substrate, coatings and design features, the popular application-based range offers high levels of process security and performance across a range of engineering materials. Each tap features a colour ring on the tool shank denoting material suitability, promoting quick and easy tool selection.

The latest additions are to its yellow ring range for structural, carbon and low alloy steels (E412) and its blue ring range for stainless steels (E414). Both new taps feature a spiral flute angle of 48°. This facilitates smooth and fast chip evacuation, making them ideally suited to threading deep blind holes up to 3 x D.

A special three radii profile with constant rake angle all along the flute length leads to better control of cutting properties and prevents the nest formation of chips. This, in turn, promotes increased productivity by minimising machine downtime.

Chip evacuation is further facilitated by a back taper which reduces chipping on the

last threads of the taps. This feature also reduces torque when the tap reverses, resulting in longer tool life.

Other material types covered by the Shark range include red ring for alloy steels, green ring for aluminum and white ring for cast iron. All are manufactured from a unique powder metallurgy tool steel, different to any other HSS-E-PM. This provides an unbeatable combination of toughness and edge strength.

To find out more about all these new products contact your local Dormer Pramet sales office, or to download a pdf of the new Shark Line brochure visit:

**[www.dormerpramet.com](http://www.dormerpramet.com)**

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



The latest additions are to Dormer Pramet's yellow ring range of taps for structural, carbon and low alloy steels and its blue ring range of taps for stainless steels

sales and technical support service operates from 30 offices, serving more than 100 markets worldwide. These are supported by dedicated production facilities in Europe and South America and a highly developed distribution and logistics network.

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## New tools for milling small threads

The new DCG thread milling system has been developed by Horn for producing M1 to M2.5 metric ISO threads DIN 13 - 20. The solid carbide, single-row, coated milling cutters, which have extremely sharp edges and are suitable for universal use, are available as standard for producing a thread length up to 2 x D. They demonstrate their special capabilities and efficiency when machining steels, stainless steels, cast iron, non-ferrous metals and in particular hard-to-cut materials used in the medical sector, for example.

DCG solid carbide mills have been proving themselves in the production of clean, high quality threads from M3 to M12 for many years. As the single-row milling cutters can be used for different pitches, a high degree of flexibility is provided.

### New coatings improve tool life

Materials that are extremely difficult to machine can pose a significant manufacturing and financial challenge to cutting tools, particularly when it comes to small and miniature parts. To address the

needs of these applications, in which tools from the Supermini product series machine holes with diameters from 0.2 mm, HORN has developed the EG3 and EG5 coatings.

The distinction between the two types rests in their substrates and layer thickness and they make it possible to achieve an extremely smooth layer, reducing the amount of heat that is transferred to the tool, and the cutting edge in particular, thanks to significantly lower friction. A golden wear layer provides a coating for improved wear detection.

Numerous tests, plus experience that customers have gained in practice from highly precise, reliable procedures, have confirmed the excellent performance that the new EG3 and EG5 coatings are able to achieve. In comparison to previous coatings, they achieved increases in tool life of as much as 100 percent, depending on the material.

The new coatings have been developed for the Supermini, Mini and 312 tool systems. Supermini is primarily used for boring and grooving of hole diameters



≥ 0.2 mm (0.0079"). The Mini tool system comes into play in similar processes, but for hole diameters starting from 6.0 mm (0.2362"). The triple-edged inserts of the 312 system are also used for grooving and parting off, as well as for external machining and similar machining processes involving hole diameters from 46 mm (1.8110").

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# iMX series expansion

## New grades and ball nose geometries

iMX is a revolutionary end mill system that combines the advantages of both solid carbide and indexable end mills. Huge performance advantages and savings can be gained especially when long overhang applications are required. The cost of extra-long solid carbide end mills is negated by using exchangeable heads, it is this interchangeability that also reduces tool change times because the head can be simply unscrewed rather than be unclamped from a chuck or shrink fit holder as a conventional end mill would be.

The iMX series has recently been expanded with two new types of ball nose head and two new carbide grades, EP8110 and EP8120. These new grades are designed specifically for hardened steel applications and have a new multi-layer coating that has increased adhesion to the substrate. This provides the better wear resistance needed when machining harder materials. The two new head geometries iMX-B3FV and iMX-B2S are ball nose types with three and two flute types respectively. The three flute type employs a high helix ball geometry that is resistant to fracture and a strong back taper making it suitable for stable deep shoulder machining. The two flute type has a low helix ball design that



makes it ideal for finishing hardened steels up to 65 HRC.

A key feature of iMX is the double face contact of carbide head and holder that enables security and rigidity close to that of a solid type end mill. This is made possible because the taper and end clamping faces of the head and the holder, are both solid carbide and only the threaded part is composed of steel. Benefits of this secure and accurate clamping method when compared to the usual steel to carbide method are greater efficiency from increased cutting parameters, improved accuracy and the all-important factor of reliability.

An exchangeable head range of end mills has obvious advantages for reducing inventory levels and tool change times. Additionally, they are capable of high performance over a wide variety of applications. The primary application area is the machining of titanium and heat resistant alloys such as Inconel. Furthermore, high performance milling of stainless steels,



carbon and alloy steels, plus hardened steels is also a standard area of application.

This wide variety of applications is made possible not just by the strong and reliable clamping system, but by the Smart Miracle coated carbide grade EP7020. The super fine, super hard carbide substrate has an innovative (Al, Cr)N Smart Miracle coating that can deliver substantially better wear resistance than conventional coatings. The surface of the coating has also been given a smoothing treatment, resulting in better machined surfaces, reduced cutting resistance and improved chip discharge. This next generation Smart Miracle coating delivers class leading performance and tool life especially when machining stainless steels and other difficult-to-cut materials.



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## Four cutting edges and three geometries in one innovative grooving system

The innovative Walter Cut MX from tooling expert Walter GB is a grooving and parting off tool that combines all the advantages of previous systems, having four cutting edges and three geometries in a single system.

Cutting depths of up to 6 mm and cutting widths of 0.8 mm to 3.25 mm are available as standard. Non-standard sizes and versions can be supplied via the Walter Xpress bespoke tooling service and the tooling's precise centre height and precision-ground cutting edges make the system ideal for precision grooves, circlip grooves and small diameters.

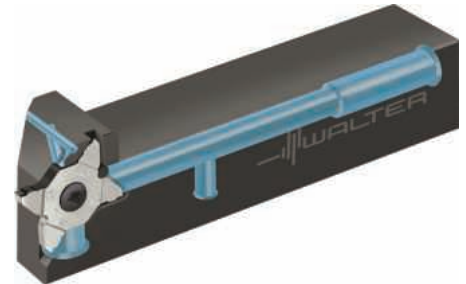
The efficiency of the system is such that only one type of cutting insert is required for both the left- and the right-hand toolholder. And if one cutting edge breaks, work can continue with the remaining edges.

Each of the indexable inserts boasts four precision-ground cutting edges and is available in three chip former types, GD8, CF5 or RF5, the CF5 sintered chip geometry enabling superb chip control at light feeds;

plus the proven Tiger-tec Silver PVD cutting tool materials.

The self-aligning, tangential clamping system and the dowel pin location in the insert seat provide stability, which in turn allows for high repeatable accuracy and process reliability. It also prevents the inserts from being incorrectly fitted.

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



The Walter Cut MX is a grooving and parting off tool with four cutting edges and three geometries in a single system

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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## ITC offers complete milling line from Widia

The ultimate shoulder milling solution for step-down applications has now been launched by Industrial Tooling Corporation (ITC). The new VSM490 Series of Widia indexable insert cutting tools eliminates finishing operations and improves productivity when machining a wide variety of materials.

From an economical perspective, the new VSM490 Series of double sided 90-degree inserts offers four cutting edges to reduce cost per insert and improve economy for the end user. This latest addition to the Widia Victory Shoulder Mill (VSM) range is extremely versatile with a complete line of insert grades that accommodate highly-productive machining of cast iron, stainless steel, steel, aluminium, titanium and a host of challenging aluminium alloy materials.

Suitable for operations from roughing through to finish machining, this versatility is permitted by a high-positive geometry and comprehensive line of insert grades that drastically reduce cutting forces compared to alternate product lines. The flexibility of

the new VSM490 Series is heightened with the availability of both 10 mm and 15 mm inserts and a complete line-up of tool holders.

The 10 mm screw-on end mills are available with 16 to 32 mm Weldon, cylindrical and shell type end mill tool holders, 40 to 125 mm shell mills, JIS shell mills from 80 to 125 mm and the largest and extremely robust M4000 cartridge milling system from 125 to 315 mm. Alongside the 10 mm insert line is the 15 mm designation. The 15 mm inserts are available with screw-on and cylindrical end mills from 25 to 35 mm, 25 to 40 mm Weldon end mills, 40 to 160 mm shell mills with JIS shell mills from 80 to 160 mm and the high material removal M4000 cartridge milling system from 125 to 315 mm. Each of the toolholders in the VSM490 Series is provided with a selection of insert seats for economical and high performance cutting.

This comprehensive line-up of toolholders is complemented by four insert geometries that are all available from Tamworth tooling manufacturer ITC. The



four grades include the ALP geometry for finishing and low powered machine tools cutting non-ferrous materials and the ML geometry, which is the first-choice grade for stainless steel and light machining and finishing operations on a variety of materials.

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# SCHUNK extends its modular system for workpiece direct clamping

The SCHUNK VERO-S quick-change pallet modules offer a whole bundle of advantages for users when it comes to direct workpiece clamping without interfering contours. These benefits include free 5-sided access to the workpiece, a defined clamping solution, high repeat and positional accuracy and also high pull-down forces for challenging operations.

Now, SCHUNK further extends its modular system and these benefits for direct workpiece clamping by introducing the new SCHUNK WDB basic modules, WDS staple modules and the WDN direct clamping modules. These new additions will ensure that the efficient principle will also work in the tool and mould making industries as well as other sectors where end users work with free-form parts with complex geometries, small lot sizes and high precision requirements.

By using SCHUNK WDB basic modules, WDS staple modules or WDN direct clamping modules (Ø 99 mm) that can be flexibly combined with the clamping pillars in various heights, moulding plates, free-form parts and other workpieces can be directly clamped on the machine table in no time at all. No additional clamping devices are required, so there are no interfering contours. The compressed air supply of the direct clamping modules is ensured via media transfer, while monitoring of the workpiece presence is also possible. The clamping pillars ensure a defined clamping situation, a reliable simulation and a collision-free, highly efficient operation. Due



to the high accuracy of the clamping solution, workpiece changes can be implemented quickly. In addition, part clamping can be done precisely and easily according to the existing retro-fitting plan and the parts can be machined again.

The modular nature of the product ensures that custom solutions are not required. The new module sizes of the extended modular system have a height from 80 mm and are finely graduated in 10 mm steps that are easy to implement. The staple modules are available in five heights that include 30 mm, 50 mm, 80 mm, 120 mm and 160 mm. These can be actuated with a hexagon key in no time at all. The force and form-fit clamping connections lock the individual modules with pull-down forces of up to 25,000 N at an actuation torque of 50 Nm.

This ensures the integrated pull-down function ensures maximum hold and in turn delivers maximum stability. The direct clamping modules are available in three versions that connect the clamping pillars with the workpiece pneumatically actuated (6 bar) with a fixed Z-axis reference. The system can also be manually or pneumatically actuated with integrated compensating function in Z-direction (11 mm). The latter is used for deformation-free support of the workpieces. For system implementation the system on every common machine table, the modular system includes basic module versions for T-slot plates, grid plates, and

VERO-S clamping stations. Standard fixed clamping pins without recess mount, cylindrical clamping pins and conical clamping pin extensions are available as an interface to the workpiece. Special clamping pins with floating pitch compensation in one or two axes (each +/- 1mm) can be used for compensating workpiece tolerances or thermal expansion.



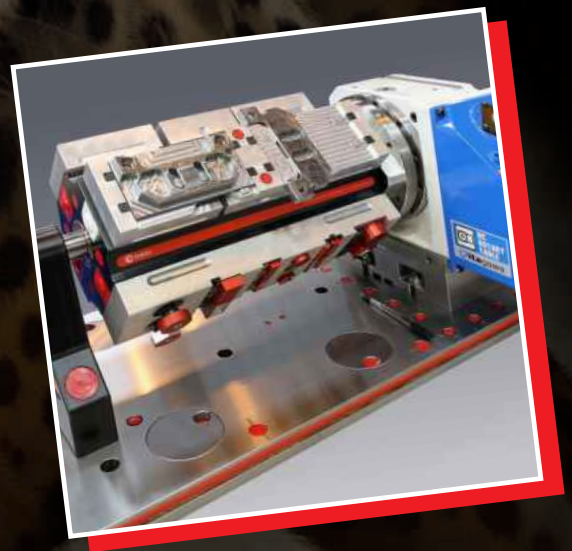
Every interface uses a scope-free taper centring, which ensures a repeat accuracy of <math><0.005\text{ mm}</math>. Feed chamfers at the module interface allow quick joining of the clamping pillars. The workpiece is clamped via spring force in a self-locking and form-fit fashion without needing compressed air. The workpieces remain safely clamped even in the case of a sudden pressure drop in the air system. In order to increase service life and process reliability, every functional part such as base body or clamping slide are made of hardened, stainless steel are absolutely corrosion resistant and easy to clean.

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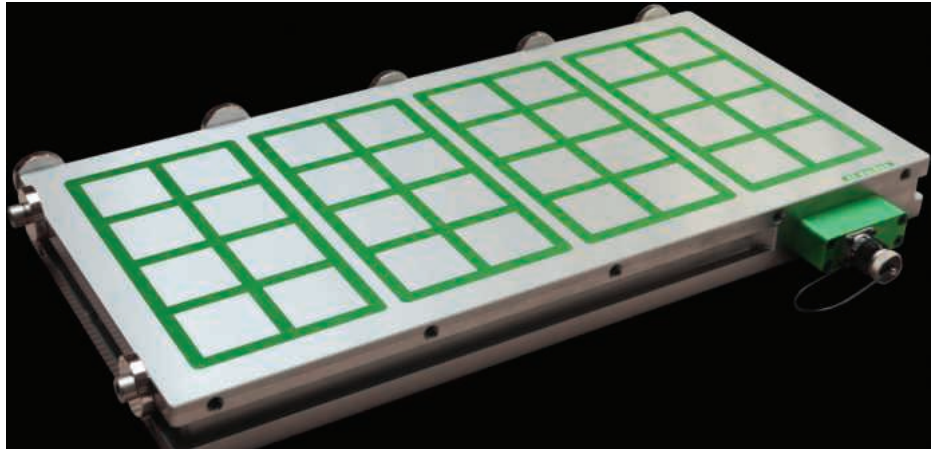
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# Extended and enhanced magnetic workholding solutions

Exclusively available from workholding specialist Leader Chuck Systems, the Walmag range of permanent magnet, electromagnet and electropermanent systems for machining applications such as grinding, turning, drilling and milling, as well as wire and die sink EDM machining, has recently been expanded and enhanced. Interest will no doubt be increased further with the Walmag Mastermill. An electromagnet permanent magnet, Mastermill offers a flexible solution for a variety of workholding applications and a holding force of 170 N/cm<sup>2</sup>. The top face is produced from a homogenous single piece of steel so there is no chance of swarf or coolant ingress into the electronics of the chuck. Designed with a recess so the chuck can be clamped down onto the table of the machine tool, it can also be drilled through at designated points to allow it to be bolted directly to the worktable or to a pallet changing system with M12 bolts. Pole extensions can be placed on the surface for five-sided machining operations using simultaneous 5-axis or 3+2 positional milling techniques.

Meanwhile, the Neomill Compact is a permanent magnetic chuck for milling operations. Ranging from 250 x 150 x 50 mm up to 600 x 300 x 60 mm (L x W x H) it features the strongest permanent magnetic field in the range with a holding force of 160 N/cm<sup>2</sup>. Although very rigid, remaining flat and stable under heavy machining loads, the Neomill Compact is designed to be light to handle and lower in construction to minimise the impact on the machine's Z-axis travel. Again, the top face is a single piece of steel that is water-proof, and it can be pocketed by machining. Up to 10 mm of top



face can be machined so raw material location recesses can be created and any accidental damage can be removed to revive the plate, with a visible indicator to advise when the limit is being reached.

For turning applications, the Neostar provides a magnetic solution and is available from 130 mm to 800 mm diameter. A robust electro-permanent magnetic chuck that is circular in design, milled from a single piece the top plate has no lamellas and is fitted with radial poles using a double high energy Neodymium magnetic system. A 5 mm machinable top plate allows location recesses or spigots to be created or damage to be machined off. With a holding force of up to 140 N/cm<sup>2</sup> it is said to be ideal for turning and grinding, within the same set up users can carry out ID, OD and top face work. Also, with all Walmag solutions, it achieves fast clamping with no deformation of the workpiece.

Produced with an aluminium body, the Alustar range is lighter and also features a bespoke worm gear activation system. This allows the chuck to vary the clamping force, so that users can set up and true the workpiece using 10 to 20 percent of the holding force before applying full clamping power when the part is set correctly. These chucks are available in diameters from 200 to 600 mm.

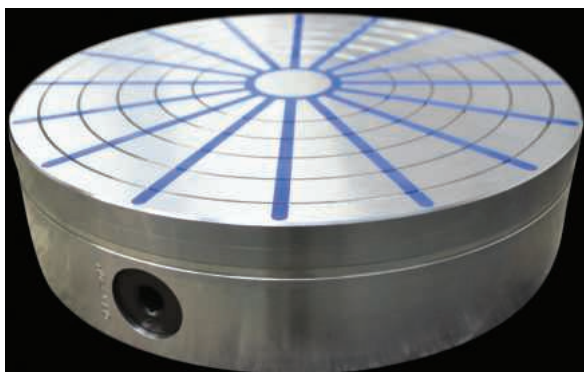
ELMag and ELMag-X were launched at the recent EMO exhibition in Hanover, and are designed for surface grinding small to medium and medium

to large components respectively. These completely new high performance electromagnetic chucks feature embedded coils with an ultra-hard epoxy resin insulator to provide an even distribution of the magnetic field across the complete surface of the chuck. This performance does not deteriorate over time and the chuck will always function correctly over their life span.

Mark Jones says: "Unlike pressure-based holding methods magnetic holding introduces zero stress into the part so there is little chance of any deformation. Walmag products are developed for the long-term and they just keep performing, backed by a two-year warranty."

"These magnetic systems are extremely cost-effective compared not only to the competitors but with other methods of workholding. Previously part of the Walker Magnetics Group, Walmag has an established reputation for developing and manufacturing high performance workholding solutions using various magnetic technologies. With a depth of application knowledge built up over many years the Walmag staff can provide extensive information and offer manufacturing industry focused advice on aspects of workholding using magnetic force."

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## Manipulate workpieces weighing up to 2,000 kg

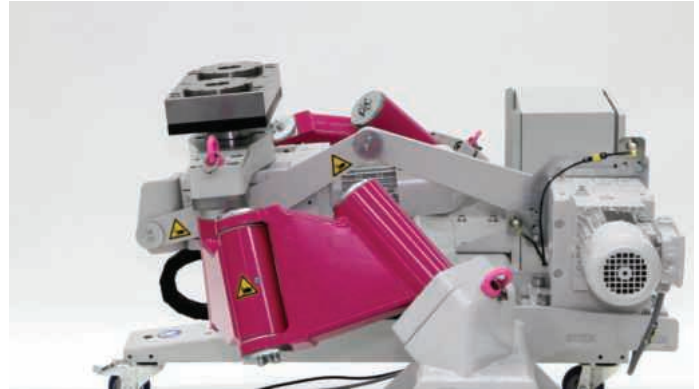
The new Centrick High-tech Manipulator from Roemheld enables the tilting and turning of heavy workpieces up to 2,000 kg in weight. The articulated arms can endlessly and continuously rotate workpieces and tilt them up to 90 degrees.

This latest addition to the Modulog range of assembly and handling technology can tilt and turn products of any shape. It is ergonomic, space saving and efficient. Unlike conventional tilting and turning

fixtures, the Centrick moves components close to its centre of gravity so the working height remains more constant. Its small swivel radius ensures a high stability and if it is moved, holding brakes maintain a stable assembly position.

The Centrick from Roemheld is quiet to operate, with very low power consumption and can be easily integrated into assembly lines and is compatible with Industry 4.0 paced assembly processes. It can dramatically reduce times for assembly and handling of materials, increase safety and reduce expensive downtime.

Roemheld is committed to researching and developing products designed to meet not only the demands and expectations of today's discerning buyer, but also emerging markets and applications. Through



continued improvement of products and services, the Roemheld Group intends to remain an innovator at the forefront of technology providing 'All your workholding needs from a single source'.

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## Flex Grip: one closer, four workholding solutions

Designed for 4th and 5th axis, rotary indexer and stationary applications, Lexair's Flex Grip reduces set up times with 10 second collet change capability, and .0002 in part accuracy.

Lexair's New Flex Grip closers are designed for versatility and efficiency, and are proven to boost productivity for a variety of machining operations including 5-axis, rotary indexer and stationary applications. The manual/hydraulic closers are clamped through a screw pump with a spring return opening. A part stop disk is inserted and removed from the top to eliminate the need to remove the closer from the mounting base. The closers can also be equipped to operate under M-code command for fully automated applications.

With the addition of a Hardinge 5C and 16C-tooling adapter, Flex Grip closers can be used with Hardinge FlexC™ collets and Sure Grip I.D. mandrels, 5C and 16C collets, as well as 5C and 16C step chucks, providing four workholding options in one collet.

Flex Grip closers are available in sizes of 65 mm and 80 mm and grip force up to

21,600 lbs at 65 lbs/ft. The collets can be custom-fitted to nearly any application and, according to Lexair, testing has yielded 0.0002 in part accuracy, with ± .020-in range on part diameter and a 10 second collet change.

"With the addition of these tooling adapters, the 65 and 80 mm Flex Grip closers are some of the most versatile workholding solutions of their kind," says Steve Breslin, national sales manager for Lexair. "We've checked all the boxes: easy to setup, easy to use, excellent part results."

Lexair was founded in April 1977 as a manufacturer of high pressure compressors and stainless-steel valves for the US Navy. In 1985, it acquired all rights to the hydraulic and pneumatic valve lines from Airmatic Allied, a division of Snaptite Inc, which included the Hi-Cyclic® product line from Beckett-Harcum. These products are now manufactured and distributed under the Lexair name. In 1994, the company introduced its first bar feeder and in the same year became the exclusive North American agent for the Multifeed magazine



style short bar loader manufactured by Hydrafeed Ltd. In 1996, Lexair designed and released the Mini-RHinoBar® hydrodynamic bar feeder for the CNC Swiss-type screw machine market. In the same year, it acquired the complete collet chuck lines from Buck Tool Company and has since developed many new collet workholding devices for the machine tool industry. 2002 saw the acquisition of the Production Dynamics® line of collet style chucks, which include the popular Full-Bore® and Prodyne® models.

**Lexair**  
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# Metrology specialist announces restructuring

Measurement Solutions, the UK partner for Creaform 3D portable metrology and Metrologic Group inspection software, has announced plans to re-structure its business activities in response to the changing demands of customers and the 3D measurement and scanning market here in the UK.

Originally founded in 1998 as a solution provider for users of co-ordinate measuring machines (CMM's), Measurement Solutions has grown to be one of the UK's leading independent providers of CMM services and solutions as well as 3D scanning technologies. However, with manufacturing industry progressively moving away from traditional fixed CMM solutions towards portable metrology systems, in particular hand-held scanning technologies, and the implementation of automated inspection using industrial robots, the company has announced a radical re-structuring of its activities. Above all, these changes will provide customers with a more responsive and technically capable sales and support experience.

The measurement and inspection market has seen massive changes in recent years. Iain Caville, company founder and managing director, comments "Throughout the last two decades, the metrology landscape has remained somewhat stagnant, with CMM's and portable arms being the only viable technologies available for inspection and QC. This gave users little choice when it came to metrology solutions, with the same companies dominating the supply of measuring equipment. However, recently we have seen the emergence of radically new and innovative technologies such as optical measurement and 3D scanning from exciting new enterprises, such as Creaform. These new technologies have opened the eyes of anybody involved in measurement and inspection as to new ways of acquiring quality measurement data."

### Dedicated technology teams

The new business structure will see the formation of two separate technology teams, each dedicated to different market application and product requirements. The new Portable Metrology Division, headed by Jason Bridge, who has over 20 years sales

experience within the metrology and 3D measurement sector, will focus primarily on portable measurement solutions, providing an array of 3D measurement and scanning systems for a wide range of applications. Activities will focus exclusively on sales and support of portable measuring systems for industrial applications, such as the market-leading HandySCAN3D and MetraSCAN3D solutions from Creaform, providing customers with a wide range of metrology, inspection, product design, and reverse engineering solutions, with the flexibility to operate with all types of CAD and inspection software.

development. For many years we have been tremendously successful in providing customers with class-leading measurement and scanning technologies. Our portable scanning solutions are easily the fastest selling systems throughout the World, and we now recognise the additional need to create a dedicated team of engineers to deal with the growing market in inspection using industrial robotics and to better address our customers' needs to better implement existing measuring systems."

The new Metrology Integration Division will provide the latest CAD based inspection software for traditional measuring devices,



To fully complement these activities, David Harper will head the new Metrology Integration Division to focus heavily on providing software solutions to make full use of customer's 3D measuring systems. This will include not only traditional CMM applications and services, but will also be dedicated to providing quality control solutions through the integration of proven metrology software within the emerging automated measurement market using industrial robots. With over 30 years' experience in CNC CMM applications, David Harper brings a wealth of automated inspection knowledge to this relatively new market sector.

Iain Caville continues "This is an extremely exciting opportunity for our future business

such as CMM's, portable measuring arms, laser trackers and portable 3D scanners. Utilising the class-leading Metrolog X4 suite of software, any make or model of measuring device can be brought right up to date to deal with today's measurement and inspection demands, in most cases irrespective of age or condition. The software has direct interfaces to most CMM controller systems, so users have the possibility to upgrade a machine without having to change controller hardware, enabling them to continue using their legacy software for existing parts and to fully utilise the new software for future programs. In addition, the new team can also offer complete CMM retrofits, including CNC controller hardware, hand-box controls,

probing systems, etc., and being ISO17025 accredited can also provide UKAS certification according to the latest standards.

The main reason for the restructure however, is to address the growing demand for integrating metrology solutions with industrial robots. In this case, the Metrology Integration Division will approach the robotics sector from a completely different perspective than has been seen so far in the market, effectively treating a robot inspection cell just like a CMM. A typical robotic inspection cell consists of an industrial robot, a measuring device (such as a laser or structured light scanner) attached to the robot, software to program the robot movements, and metrology software to analyse the results. Current solutions are exclusively offered either by a robot supplier or by a measuring device manufacturer, offering the end-user with little or no flexibility to adapt or select alternative robots and/or measuring technologies. In addition, these also require the customer to learn and implement multiple software packages for each step of the process.

The new approach offered by Measurement Solutions is to focus on the implementation of Metrolog X4 i-Robot as a single integration software that can connect all robots and all measuring devices into a common cohesive solution. Metrolog X4 i-Robot is a dedicated 3D inspection and metrology software that is the only software solution able to provide off-line and

real-time robot programming, metrological analysis and PLC integration, all-in-one software package. The key advantage of this approach is that the user has complete freedom to combine any make of robot with any make of measuring device. There is no limitation to the flexibility offered, as users can select the best combination of robot and measuring device to suit their specific application needs and support requirements, and can easily exchange or upgrade measuring technologies if required in the future.

Metrolog X4 i-Robot builds on the already proven 3D inspection software that has been developed over 30 years by Metrolog Group. With thousands of licences in use throughout the world at many leading manufacturing organisations, such as Boeing, Airbus, BAE Systems, BMW, Nissan, VW Group and many of their major supply chain partners. The software is the only solution that can fully address any combination of measurement system and device configurations, with direct interfaces to all makes of CMM, robots and probing & scanning devices. The key benefits are flexibility and standardisation, as the software enables users to fully utilise any measuring device using one common software platform, removing the need for additional training and a dependency on specialist inspection personnel.

"We want our customers to be able to take full control of their measuring processes, and not have to compromise and

adapt the process due to limitations imposed on them by the robot or measuring device provider," says David Harper. "With the X4 i-Robot solution, the customer is free to choose any combination of robot and measuring device. For example, they may have a preferred robot integrator or scanning system provider who they wish to work with, or even have existing robots or scanners available that they would like to utilise for this purpose. We can combine all devices into a fully automated solution, which can even be programmed by the user just like a traditional CMM, without the need for intervention or dependency on third party programming companies."

Iain Caville concludes: "This is just the first step in re-inventing our relationship with the market and our existing and future client base. We have more exciting developments coming in 2018 that are sure to provide our customers with more opportunities to fully integrate the latest measuring technologies into their current and future manufacturing processes."

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# NTG Invests in third Aberlink CMM

Established in 1979 as a provider of precision tool-room services for local North-East business, NTG Precision Engineering quickly gained an excellent reputation for the quality of its work and soon established a loyal customer base across a range of demanding industries. Now, following almost 40 years of continuous growth, in addition to serving the North-East region's precision engineering requirements, NTG has developed into a major supplier to a variety of demanding industrial sectors across the UK, Europe and USA.

Regular investments in state-of-the-art machine tools, advanced production aids and high precision inspection equipment has ensured that the company remains at the forefront of technological advancements and is able to adapt to changing marketplace conditions.

Reflecting the company's highly developed quality ethos, NTG holds the ISO 9001:2008 accreditation and has held the prestigious 'World Class' precision machining accreditation from the Gauge and Tool Manufacturers Association (GTMA) since 2008. In addition to regular staff training, regular investments in premium quality inspection equipment also helps NTG to compete in international, quality driven market places.

The mainstay of NTG's quality and inspection provision is its collection of high precision Aberlink coordinate measuring machines (CMM). Ever rising levels of business and the need for the company's inspection department to keep pace with increasing levels of production recently prompted the purchase of the company's third Aberlink CMM.

Mark Withycombe, NTG operations manager, explains: "In addition to other advanced machine tools, our first-class subcontract precision engineering facility is equipped with sophisticated 5-axis machines that are operated by highly skilled, dedicated staff. This enables us to deliver quality components and engineering solutions to the most challenging of both UK and international customers.

"Whether it is a one-off special or batch work, we are able to work from drawings or can also reverse engineer samples to suit all needs. In addition to delivering on time and on budget, NTG's reputation has been built on our culture of providing the highest standards of quality.

"Just as we pursue a policy of remaining loyal to suppliers who not only deliver premium quality machine tools but also provide first class levels of service, we have remained loyal to Aberlink for the same reasons. As well as the accuracy, speed and ease-of-use of our Aberlink CMM's, we have been very impressed with their reliability and the excellent levels of service the company provides.

"Recent increased levels of production meant that we needed a further CMM for our inspection department. Although we were very happy with our previous two Aberlink CMMs, as other manufacturers' machines may have improved, we looked at a couple of alternative CMMs. Satisfied that Aberlink's Axiom Too CMM best suited our needs, we were happy to remain loyal to the brand and to place another order.

"Now installed and fully operational, just like our existing Aberlink CMMs, our new, third machine is able to get through large volumes of precision component inspection routines and it has removed the potential for delays in our inspection department.

"Given the nature of many of the industries we serve, such as the



oil and gas, subsea, power generation and automotive sectors, the ability to offer the highest standard of component inspection is a prerequisite for gaining contracts."

The Axiom Too is the best-selling CMM from the largest UK-owned coordinate measuring machine manufacturer. Aberlink's cost-effective Axiom Too is available in both manual and CNC variants in a range of capacities and is described by Aberlink as the 'complete inspection centre'. The recently upgraded CMM is ideal for use in either controlled environments such as inspection departments, or within less than perfect shop-floor conditions, as it boasts an aluminium bridge with a very low thermal mass.

Borrowed from the laser optics industry, the CMM's sturdy table consists of an advanced granite/aluminium honeycomb construction, this arrangement, provides natural damping and further improves the machine's thermal properties. Despite the Axiom Too's generous X-Y-Z measuring volume, 640 mm x 600, 900, 1,200 or 1,500 mm x 500 mm, the machine's compact design occupies a relatively small footprint, with the controller and all peripherals housed within the Axiom Too's workbench.

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# New intelligent process control software for Renishaw's Equator gauging system

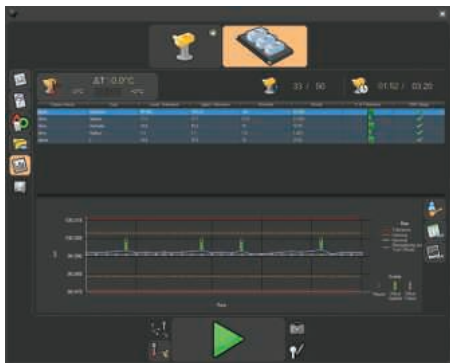
The Renishaw Equator™ flexible gauge is now offered with IPC (intelligent process control) software, providing the functionality to fully automate tool offset updates in CNC manufacturing processes. Improved capability in precision part machining, reduced setting and process adjustment time, and integration with automation systems are some of the benefits that users can now expect.

IPC is used with the existing software running on the Equator controller, using recent historical gauging data to determine process corrections. Connection to a compatible machine tool can be as simple as connecting an Ethernet cable from the Equator to a CNC machine. This capability has already been used by Renishaw customers worldwide to achieve considerable performance gains across a wide variety of industries, applications and CNC machine types, including lathes, machining centres and highly automated machining cells.

### Controlling processes with frequent gauging

The new IPC software allows constant monitoring and adjustment of a machining operation, keeping part dimensions close to nominal and well within process control limits. This means that any process drift is quickly corrected, improving part quality and manufacturing capability, along with reducing scrap. The proximity of the Equator gauge to the CNC process allows rapid measurement and process adjustment at the point of manufacture, avoiding time delays or relying on finished part (tailgate) inspection.

The IPC software can average results



across several parts to determine the true process mean for adjustment of each cutting tool. For process control purposes, it is usual that only one machined feature per tool offset will require gauging, as compared to many features for typical Quality Assurance (QA) applications. The frequency and control of offset updates can be configured on a feature by feature basis depending on design tolerances, process variation and tool wear rates.

### Reduce dependence on skilled operators

The ability to correct a process automatically with IPC software eliminates the potential for manual data entry errors and removes the requirement for an expert to decipher traditional measurement reports into a process correction value at the CNC machine.

### Update multiple machines from one Equator gauge

An Equator gauging system can be connected to one or multiple CNC machine tools, so that parts from different machines can be gauged on one Equator, with the offset updates being sent to the corresponding machine, part/machine identification is required. Connection to multiple machines requires an Ethernet hub or is via an existing factory network. Closed loop unmanned process control of a cell of machines is possible and a key requirement when used in conjunction with factory automation systems.

### Intelligent process control of cutting tools

Options within the IPC software can constantly monitor the process and detect excessive tool offset update values, indicating tool failure or high rates of wear, and automatically signal to the machine that the tool needs changing.

### Where IPC software is of benefit

IPC software has proven to be particularly useful for conventional CNC lathes or Swiss-style sliding head machines, where integration of a conventional machine tool probing system may be difficult due to machine configuration or tool station availability. Using the Equator gauging



system is also beneficial where measurement due to feature access or size would be difficult to undertake on the machine tool. Also, the use of off-machine gauging and IPC as a parallel activity is the preferred solution where minimum machining cycle time is a critical requirement.

### IPC compatibility

The first release of the new IPC software allows connection to one or multiple machine tools, with direct Ethernet links from the Equator Controller to Fanuc, Mazak and Okuma CNC controls.

Fanuc controls that have been tested and proven include the Oi, 30i, 31i and 32i, with the Focas2 option installed.

Mazak controls currently supported are the Smooth X, Smooth G, Matrix2 and Matrix controls with the Mazak API installed.

The Okuma OSP300L and OSP300M controls are supported, on machines with the Thinc API installed.

Future software releases will further increase CNC control compatibility.

### The versatile gauge

The Equator gauging system is unique in its design and method of operation and has already changed the thinking of thousands of production engineers, making it their gauge of choice.

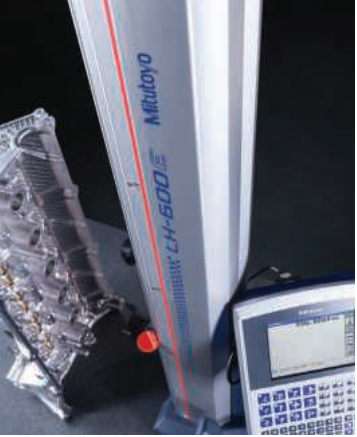
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# Augmented reality for quality assurance

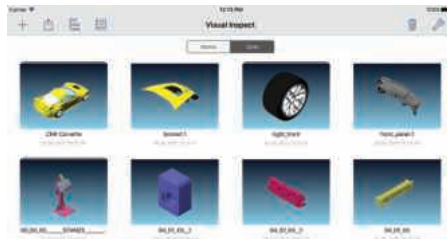
The subject of augmented reality has been a hot topic in recent times. Augmented reality is where reality is enhanced by computer generated information, i.e. making additional information about the real world visible to the user. This can be achieved by displaying the information using glasses, by projecting directly onto real objects using a video projector or laser projector, or by overlaying a video image with additional information, captured using a camera.

In industry the use of tablet PCs with an integrated camera has become popular. In this case the video image captured by the camera is shown on the display and "enhanced" with additional information. The accuracy of the overlay achieved here enables extremely fast and cost-effective inspection of components, tools and production facilities.

In times of globalisation, flexible, mobile control and monitoring of processes is increasingly becoming a key issue, as ensuring quality across the global process chain also is, resulting in increasing costs in terms of personnel, time and travel.

Recently there has been a noticeable trend of moving the necessary systems away from fixed control centres and input terminals to mobile terminals. This is where augmented reality technologies can be very useful in achieving considerable added value. They enable direct, intuitive access to information and fast variance inspection, as the information is available where it is needed. Processes can also be supported continuously and without media disruption throughout the entire process chain. This can be illustrated very well in tool making, for example.

With the product "Visual Inspect AR", FARO has found a way to use augmented reality "out-of-the-box" and to apply augmented reality effectively in a practical setting and with a variety of additional possibilities.



Often polystyrene models for the casting of the raw cast items and the milled raw cast items are prepared by suppliers and only fitted by the OEM or the tool maker.

The monitoring of incoming and outgoing goods usually takes place by means of specially created drawings or simple checklists, which have to be laboriously compiled.

FARO Visual Inspect AR enables CAD models to be accurately overlaid onto the video image. This enables a direct comparison of the component with the plan data to be made and any discrepancies can be recognised instantly.

These discrepancies can be documented in the program instantly using photo or video evidence, with the documentation or error report being linked directly to the corresponding geometry. After checks have been made, these reports can be exported as a document "at the push of a button" or transferred straight to the relevant PLM or PDM systems. Post-processing the results of the checks, for example by manually entering them into systems or laboriously creating PowerPoint presentations, is no longer necessary.

As an additional feature these checks can be carried out with the guidance of checklists or step-by-step instructions, which provides additional security.

As well as purely the geometry, the inspector also has all other necessary information on the device, such as metadata, ISO standards, core data, etc., so no other medium is needed for the inspection process.

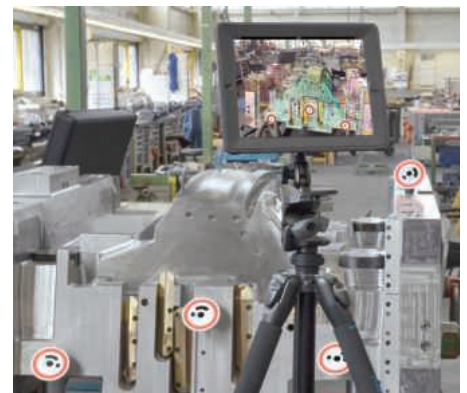
This all makes it possible to carry out incoming goods inspections more quickly and easily than ever before.

The same applies for a brief inspection after machining. If features such as holes or slots have been forgotten when creating the CAM program, this can be checked against

the construction data within minutes. It is no longer necessary to re-clip and set up the part being processed, which quickly saves a few hours.

The use of this technology also opens up new possibilities in the fitting of sub-assemblies and again helps to save time and money and to avoid errors.

Components can be identified directly at the site of installation, their installation position identified and sub-assemblies checked.



In the area of maintenance, all documents are quickly available to the fitter on-site, and installation sites can be identified quickly using the AR overlay.

With Visual Inspect AR, FARO presents a new solution that meets the needs of global, flexible production and helps companies to make their processes more flexible, quicker and more secure, while taking into account the increasing cost pressures.

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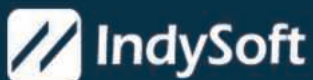
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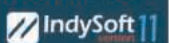


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# Roundness measuring machine meets high quality standards

Metrology expert Bowers Group has supplied Rotalink Ltd with an Accretech Rondcom 41C for the precision measurement of miniature power transmission systems and motor gearboxes. Based in Crewkerne, Somerset, Rotalink Ltd required an accurate and repeatable measurement solution for the concentricity of spindles and shafts, in order to consistently meet high standards of quality and exceptionally tight tolerances required of its components.

Bowers Group suggested a roundness measurement instrument as an appropriate solution to measure the concentricity of moulded gears at Rotalink Ltd. After a full demonstration at Rotalink Ltd's Crewkerne site, Bowers Group supplied the business with the Accretech Rondcom 41C, a roundness measuring instrument which enables the fast, easy and accurate implementation of form measuring tasks; including concentricity.

The Accretech Rondcom 41C also features excellent straightness accuracy, which was particularly important for Rotalink Ltd. The accurate measurement of squareness to a plane is critical in the high quality manufacturing of precision gears.

The Rondcom has enabled Rotalink Ltd to improve the accuracy of its manufactured components and therefore improve its products. As a company with an innovative design team, the roundness measurement machine has enabled Rotalink Ltd to ensure the accuracy of each design; not only improving manufactured components, but also improving drawings and design capabilities. Software reports generated by the Rondcom are useful for internal reports

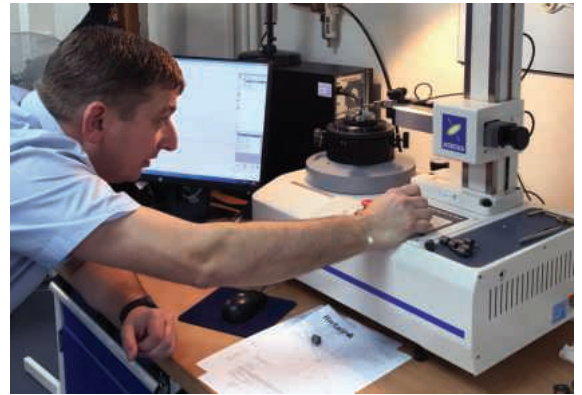
and can also be used as valuable evidence for ISO inspection reports.

Jeremy White, quality engineer at Rotalink Ltd, says: "There are now endless possibilities when it comes to ensuring the accuracy of each design and component at Rotalink Ltd. As far as concentricity is concerned, the Accretech Rondcom 41C is exceptionally accurate, and comfortably nudges ahead of rival machines."

Rotalink was also impressed by the service it received from Bowers Group. Jeremy White explains: "We received excellent initial training and installation from Ryan Kingswell, technical support and installations engineer at Bowers Group. Since we've had the Rondcom, we've learned even more about its capabilities; the more you use it, the more operatives understand the full measurement capacity of the machine.

"We decided to choose the Rondcom 41C for several reasons. One was the cost comparison to other models and the capabilities of the 41C compared to others. Another advantage was that the Rondcom could be fully integrated into our computer network. Ryan really worked his socks off to ensure that the integration was successful, working closely with our IT department to ensure full integration. The Rondcom is definitely an asset to the business."

Rotalink Limited supplies miniature power transmission systems, motor gearboxes, encoders, controllers and more to a global network of customers. The company prides itself on being a centre of excellence for the design and supply of miniature power transmission products, including DC motors with optional gearboxes, AC motors with optional gearboxes, and stepping motors with optional gearboxes. The motors and gear cases designed and manufactured by Rotalink Ltd are commonly used in a variety of applications, including cash machines, parking meters, vending



machines, coffee machines, and lubrication systems, among others.

Philip Stag, purchasing manager at Rotalink Ltd, says: "The Accretech Rondcom 41C performed very well under the criteria we set out, fully meeting our requirements and more. We were very impressed with the Bowers Group staff members involved; they had a great deal of knowledge and we received excellent training and aftersales support. They were more than willing to visit and develop a good relationship with us, giving us plenty of confidence in the product and their customer service."

Bowers provides the widest choice of cost-effective, quality measuring instruments currently available. Supplementing Bowers' own range of gauges, its sole UK agent status means that it can offer UK customers superior products from many preeminent metrology companies, such as Trimos, Sylvac, Gagemaker and Wyler.

In response to customer demand and as a result of the company's continued investment in cutting-edge technology, it now produces an increasingly comprehensive range of affordable, quality instruments intended for other applications, such as depth and external gauging. A past recipient of the coveted Queens Award for Export, Bowers currently export 82 percent of its output.

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# IndySoft goes Underground

With a history that dates back to 1863 when the world's first underground railway was created, the London Underground as we know it today was formed in 1985. Having continuously evolved to meet the expanding transport needs of Greater London and parts of the counties of Buckinghamshire, Hertfordshire and Essex, London Underground Ltd (LUT) has grown in to an immense network. Today's far-reaching system serves 275 stations and embraces over 408 km of railway, ensuring that an astonishing three million passenger journeys are made daily.

To help ensure the safety and efficient operation of the tube, LUT engineers have access to more than 20,000 instruments and gauges. In addition to specialised and bespoke equipment, the extensive inventory includes track gauges, multi-metres, torque wrenches, crimp tools, verniers, micrometres, and electrical and pressure gauges.

To certify the continued accuracy of LUT's gauges and instruments, calibration procedures are performed by a team of skilled calibration engineers at LUT's Lillie Road depot in Fulham. Each calibration staff member has access to a variety of highly accurate, UKAS traceable calibration apparatus, including torque testers, digital height gauges, manometres, plus electrical and pressure test equipment.

It is the calibration department's job to track the location of these gauges and instruments and to ensure that each piece of equipment remains in calibration. In addition to LUT's huge gauge and instrument inventory being distributed over multiple locations that have several different departments, items can also be booked-out and used on-site. Given that LUT's calibration procedures takes place either on a six month or 12 month cycle, the status and tracking of 20,000 instruments and gauges has previously presented extremely challenging logistical problems.

LUT's calibration facility previously operated a business process compliance system, although, as LUT's gauge and instrument inventory grew, this inflexible software struggled to handle the large volumes of records and the required management tasks.

To help overcome these difficulties a search was made to find a flexible software

The advertisement features a dark blue background on the left with the IndySoft logo and a list of features. On the right, there is a photograph of a person using a laptop and a smartphone displaying the software interface. A small badge in the top right corner of the image says 'Latest version Now Available!'. The text 'Calibration and Asset Management Software' is prominently displayed in white and blue.

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package that was able to match all of the company's stringent demands, and that would also remain 'future-proof' as LUT's gauge and instrument inventory grew. Having considered several other options, IndySoft was judged to be the most suitable software for both current and future needs.

After LUT purchased its first user licence and following a short training period, staff were immediately able to make use of all basic tasks. Then, as IndySoft proved to be intuitive and easy to use, more advanced functions were quickly mastered. Also, all existing gauge data and history was imported directly into the IndySoft program, from LUT's older application, without any problems.

As LUT's calibration department has quite specific requirements, the help and support provided by IndySoft allowed the software to be configured to suit the department's own particular needs. Now, as IndySoft introduces additional software features, LUT staff makes use of the company's readily available support and assistance. For instance, having recently implemented an IndySoft feature that, at the start of every month, allows the department to automatically email its 'customers' with a calibration-due reminder, IndySoft's UK staff provided help in putting the new system into practice.

Due to the many 'equipment status' options available in the software, such as 'in-use', 'external calibration', 'archived', 'lost', 'stolen' and 'scrapped', LUT can now accurately record the exact status of every

piece of its equipment. Due to the trouble-free communication between many instruments' commonly used software, the use of IndySoft has allowed LUT to bring previously externally calibrated instruments, such as multimeters and clamp meters, in-house. This means that, in addition to achieving considerable cost savings, increased in-house work has drastically reduced calibration turnaround times. So successful has the adoption of IndySoft been, LUT has recently added additional licences.

Jake Bishop, managing director of IndySoft Europe enthuses: "London Underground's experience with IndySoft Calibration and Asset Management Software illustrates the system's unmatched ability to manage complicated gauge inventories, across multiple sites. Although, the use of the flexible software is equally applicable to the management of the gauge stocks of smaller concerns.

"We attribute much of IndySoft Europe's current sales success to satisfied customers recommending the software to others. IndySoft offers the most flexible and easy to use calibration system."

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## Automated "pick & place" 3D surface metrology on small batches

Alicona, a leading company in optical metrology and 3D surface metrology, has increased its surface metrology range with an automated measurement solution based on its range of measurement systems. Based around a collaborative robot, chosen for the correct weight and size of the component to be measured, the system can be used with the Alicona InfiniteFocus SL and G5 range. It can also be retrofitted to existing Alicona systems where required.

This automated system allows measurements to be made without human intervention and variability ensuring consistent, accurate and traceable results. Users have rights to control users to specific tasks.

The cobot software is integrated into the Alicona automation manager, providing seamless programming for the measurement task. As the collaborative robot can be manually moved, it allows the measurement cycle to be easily programmed in the "teach" mode. The program can then be stored for later use.

The "fingers" of the cobot are designed

for each of the components and can be easily changed when different components are required to be measured. The results can be compared against CAD data or a golden product, and the user can be presented with a go-no go result via a traffic light display system. Components that fail or pass the inspection criteria are placed in appropriate racks to either continue the process or be returned for re-work or for scrap where necessary.

In conjunction with the InfiniteFocus SL the system can be used to measure features, such as topographic "Z" data, XY data, small radii plus surface finish on part components. When used with the InfiniteFocus G5, equipped with a rotating platform, circular or cylindrical components can also be measured.

The systems are ideally suited for the in-process measurement of small batches of precision engineered components for geometric and surface finish measurement.



Measurement capabilities, depending on optical magnification, include height steps down to 20 Nm, height range up to 16 mm and Ra values down to 0.08 µm. The software is included for surface finish and profilometry.

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# New measuring equipment from Master Abrasives

A new range of measuring equipment by Innovative Automation Products is now available in the UK and Ireland from Midlands-based Master Abrasives. The Innovative product range of equipment for the grinding process includes optical, air, coordinate and other areas of metrology. A selection of tools will be available for demonstration at the Master grinding and finishing showroom in 2018.

Innovative Automation Products has been designing and manufacturing reliable measuring equipment since its establishment in 1997. The company uses advanced Application Specific Integrated Circuits (ASIC), surface mount and hybrid technologies to increase product performance whilst reducing component size and count to keep costs low. State-of-the-art manufacturing and calibration facilities complete its advanced setup in India.

Ian Meredith, Master Abrasives applications engineering manager, says: "Adding measuring equipment to our range of products means we can offer a more complete package for the grinding process alongside machines, abrasives and coolant nozzles. I visited Innovative Automation Products premises with Martin Stevens, applications engineer, earlier this year and was impressed with their manufacturing capabilities and range of products. As a result, we have agreed to become their official UK and Ireland representatives and our showroom will be equipped with their 2D height gauge, air gauge and profile projector in 2018. These products offer advanced performance for reliable and easy-to-use measuring in the grinding process."



Innovative Automation Products offers 1D and 2D height gauges, which are manual or motorised with a measuring length of 325, 625, 1025 or 1150 mm. A 3D coordinate measuring machine is also available as manual, motorised or CNC type. The 2D height gauge which will be available to view at Master Abrasives showroom features a colour graphical LCD display. The RS232 data output provides the option of evaluating measurement data externally with SPC software on a PC. A large memory capacity for 50 measuring programs of 800 steps each allows increased measurement efficiency.

The air gauges by Innovative Automation Products offer high accuracy and repeatability. They are available with single or multi-channel and single or double displays. The double channel single display air gauge with an RS 232 port for the computer interface will be available at the Master grinding and finishing showroom for demonstration.

Both vertical and horizontal profile projectors are available from Innovative Automation Products. The Innovative V400-HP profile projector with a screen diameter of 400 mm will be on display in Master Abrasives showroom. It combines high accuracy optical non-contact measurement and inspection with a measuring range of 250 x 150 mm. The vertical light path arrangement is ideally suited for inspection of parts like cutting tool inserts, machined components and shafts weighing up to 10 kg. The part can be placed on the work stage and even secured to it using a range of the optional accessories offered.

Ian Meredith concludes: "We continually develop our product range to provide solutions for industry and offer technical support to help customers to improve productivity. Our applications team can assess the manufacturing process and advise the best products for the quality control requirements in precise applications."

Master Abrasives is the sole UK and Eire agent for the Meister Abrasives Corporation, an



international manufacturer of high precision industrial abrasive products, with its headquarters in Andelfingen, Switzerland.

The Daventry-based independently owned company has built an enviable reputation for quality and service that is as strong today as it has always been. The well-known trademark of 'Master' remains on much of the product range and services offered by the company in the UK.

The tool services department at Master offers repair of all pneumatic and electric tools and services such as airline efficiency and noise assessments. It also provides solutions to hand arm vibration with tool testing in accordance with ISO 5349-2, trigger time monitors or HAV management systems, and toolbox talks for the awareness of HAV requirements.

Innovative Automation Products has been designing and manufacturing reliable measuring equipment since its establishment in 1997. This includes optical, air, coordinate and other areas of metrology where equipment is required for the grinding process.

**Master Abrasives**

**Tel: 01327 703813**

**Email: sales@master-abrasives.co.uk**

**www.master-abrasives.co.uk**

## Inspect where you want and when you want

Vision Engineering has launched Cam $\beta$  (CamBeta), a new digital inspection magnifier for portable inspection and documentation. The new magnifier is a handheld inspection device, suitable for a wide range of applications. Cam $\beta$  provides magnification up to 20x, stores up to 20,000 images and uses grids and cursors for X & Y dimensioning, simply where you want, when you want.

With a high-resolution colour display, easy button operation and image capture/download capability, Cam $\beta$  is ideal for roving inspection tasks, documenting faults and inspecting large or immobile subjects. Cam $\beta$  has been equipped with a dual LED illumination, with four settings, high contrast imaging and 30 frames video capture capabilities. A live-view video output via micro HDMI allows for the display of images on a larger screen suitable for training purposes.



Cam $\beta$  offers a convenient way of meeting critical inspection and documentation requirements. The simple design of the Cam $\beta$  helps to optimise the inspection process, as it requires minimal training to ensure all users can adequately perform their job. When time is of the essence, the portable design of the Cam $\beta$  also helps to speed up the process of inspection and decision making for operators.

The Cam $\beta$  is well suited in production environments where company policy disallows the use of mobile phones. Its lightweight and ergonomic design is superior to that of a smartphone, with one-handed operation making the Cam $\beta$  easy to manage and manipulate. The handle of the Cam $\beta$  also provides a secure grip, allowing it to be used with either a left or right hand, to suit. Cam $\beta$  is ideal for a number of applications such as electronics, mechanical, automotive, watchmaking, plastics engineering, medical and ultimately wherever fast digital documentation is needed, in one step, using one tool.

Vision Engineering Ltd is a leading-edge manufacturer of patented ergonomic stereo microscopes, digital microscopes and non-contact measuring systems. Vision Engineering introduced the World's first 'eyepiece-less' stereo microscope, the Mantis. It was an ergonomic revolution that went on to win numerous design and innovation awards.

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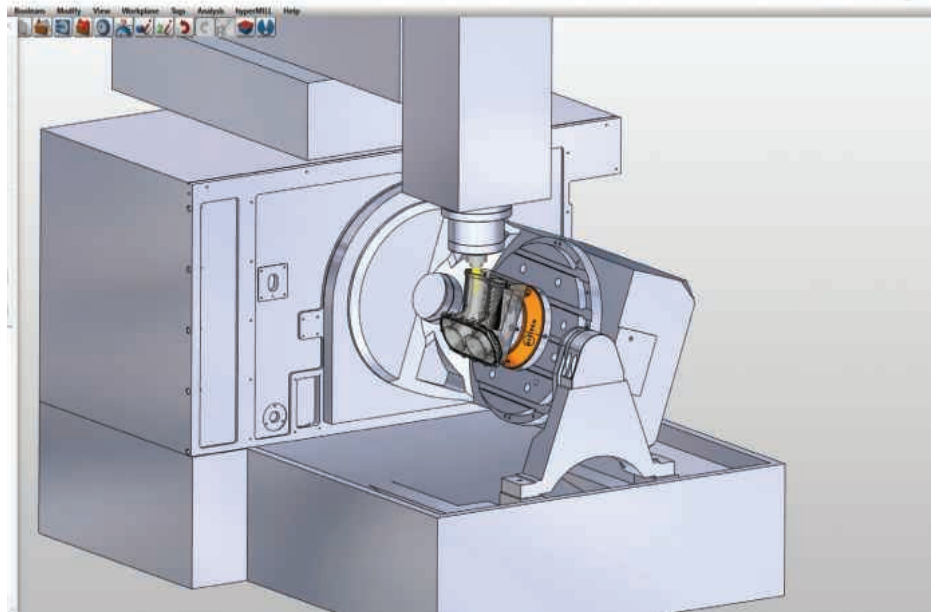
# hyperMILL proves the right port in a 5-axis storm

Located in Silverstone, no more than a short walk from the world-famous race circuit, Alitech Precision is a subcontract design, concept delivery and manufacturing company that specialises in supplying the motorsport industry. When the subcontract manufacturer purchased its first 5-axis CNC machining centre, the only feasible option for driving the machine was CAM software from OPEN MIND Technologies.

Alitech Precision opened its doors for business just three years ago with a HAAS VF2SS machining centre and a 3-axis CAM package. As the business evolved, it has acquired another two HAAS machines, a larger bed VF4SS with a 4th axis rotary table and, more recently, a HAAS DM2 high-speed machining centre. Whilst the 3-axis CAM package served the company well, it had limitations with 4th axis machining. These limitations were fully realised when the company installed a fully simultaneous 5-axis Spinner U-620 vertical machining centre.

The fledgling business needed to upgrade its CAM software and, after reviewing the numerous packages, the only feasible choice was hyperMILL from OPEN MIND Technologies. Specialising in the design of motorsport solutions and taking concepts through design to manufacture in the shortest possible time, the company works with everything from high-performance road cars to F1 teams in the local vicinity of the 'motorsport valley'.

Commenting upon how the business operates, Darren Cudd, managing director of Alitech Precision, says: "We tend to be the company that customers call when they have left their designs a little bit late for manufacture. We step in and make sure the parts and vehicles are ready to go, whether it's for the roads, the test track, the race circuit or the F1 teams. Service and response times are critical to our business and that is why we invest in high-end technology like hyperMILL from OPEN MIND."



## hyperMILL proves the perfect fit for Alitech

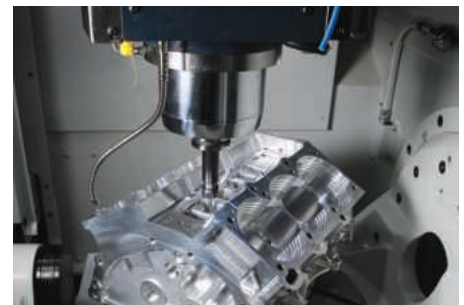
Discussing the reasoning behind selecting hyperMILL, Darren Cudd says: "From the word go, we knew we'd be doing a lot of simultaneous 5-axis machining as opposed to fixed 5-axis cutting. We narrowed down our selection to three possible suppliers. What shone out above all else was hyperMILL's full 5-axis capabilities, it was certainly better than the other two packages. Additionally, the standard 'out of the box' package from OPEN MIND was far more comprehensive than alternative systems. We found that standard features in hyperMILL were chargeable and expensive bolt-ons with other suppliers."

## Justifying the hyperMILL purchase

Prior to the arrival of the U-620 Spinner machine and hyperMILL, the company was already intent on acquiring a high-end CAM solution. As Darren Cudd recalls: "Our previous 3-axis CAM solution worked reasonably well with our existing HAAS machining centres, but it was the complicated jobs that demanded a change.

"We were machining a complicated engine block and, with the time invested in programming the job, we wanted to be sure the program was correct before the job went on the machine table. With our previous CAM solution, the simulation and collision detection was not really at the level we needed."

Taking the engine block from design through to machined component,



Darren Cudd says: "This engine block was designed in house, so there was over 100 hours of design hours and another 100+ hours of programming with our previous CAM system. Putting so much time into an engine block and not being confident in the anti-collision credentials justifies buying hyperMILL. Calculation times are massively reduced and, in the case of this engine block, hyperMILL has reduced programming by at least 50 percent. Collision checking is a critical factor. Now, we can put the full CAD model on the machine and if hyperMILL says the model is good, we know we can machine with complete confidence."

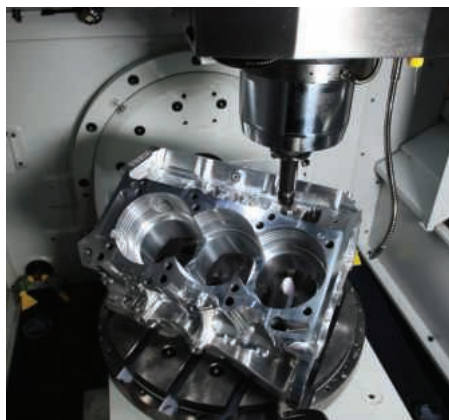
## A collision of perfection

Referring to collision detection and avoidance features, Darren Cudd says: "We recently machined a billet turbo manifold for a motorsport customer. It required two 40 mm diameter oval shaped port holes with a curved machining depth beyond 200 mm. We used an 8 mm diameter ITC lollipop cutter protruding 70 mm out of a slim 80 mm heat-shrink toolholder extension



with a 75 mm long back-end configuration. hyperMILL modelled the complete work envelope and detected the collision parameters for the cutting tool, toolholder and machine spindle. By precisely simulating the process, we are running at high-speed and the heat shrink holder is often as close as 0.25 mm to the port walls during HSM."

This feature works in complete harmony with the hyperMILL Z-Level Finishing Cycle that enables Alitech to lean the cutting tools at angles that are very close to the wall of the port holes. This permits Alitech to run short-length cutting tools in port bores. The benefit of this is improved stability, rigidity



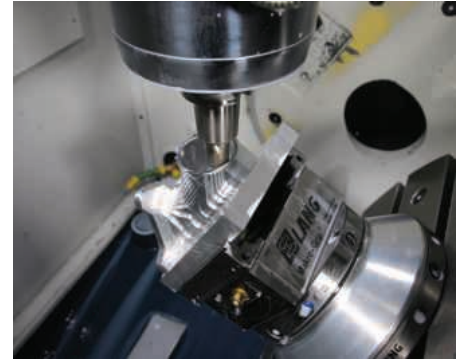
and surface finishes that permit machining at higher speed and feed parameters.

**OPEN MIND services the minority**

Darren Cudd says: "As a company, we are in the minority that conducts simultaneous 5-axis machining as opposed to fixed 5-axis machining on a daily basis. This is how we set up our business and, during the infancy stage with Spinner, hyperMILL and the concept of continuous 5-axis cutting, we certainly made plenty of use of OPEN MIND's technical support department. The help and support we have received is excellent."

Before hyperMILL, Alitech was turning away challenging projects as the subcontractor wasn't capable of delivering parts to the complexity, speed and lead-times required. This has now changed.

Darren Cudd continues: "One customer required a billet inlet manifold for a drag racing car in just two weeks. In this timeframe, we used a Romer arm to capture the engine coordinates, drop it into our CAD system and then reverse engineer a complete solution. The re-engineered manifold required six parts to be designed, manufactured and delivered in two weeks.



Without hyperMILL this would have been impossible."

**hyperMILL brings a batch of benefits**

hyperMILL has reduced programming and cycle times, improved surface finishes, lead-times and more importantly given the Northamptonshire business the confidence to take-on the most complex components.

Aside from the collision system, the speed and efficiency of programming has been enhanced by a number of other hyperMILL features.

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# Edgecam 2018 R1 reduces regeneration time

Major enhancements to the 2018 R1 release of Edgecam, from Vero Software, include time saving updates to roughing cycles for milling, turning and MTM and the prevention of unnecessary CAM regeneration.

It is this latter update which is seen as being the most important for manufacturers. When a user makes an edit to an existing command, Edgecam 2018 R1 will not automatically regenerate the remaining instructions. Edgecam brand manager John Buehler says that when editing a tool command, there will now be no regeneration if the alteration does not affect the corresponding cycles with aspects such as coolant or high-speed.

Two new items of functionality in the Roughing Cycle provide time savings in the milling, turning and MTM environments.

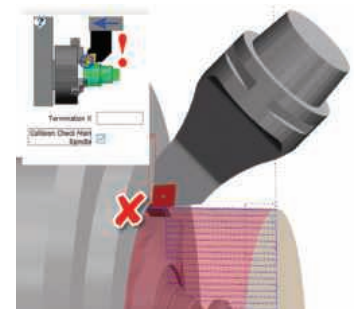
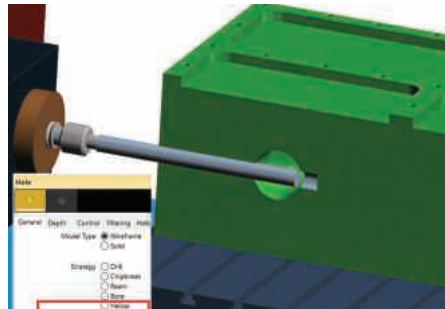
John Buehler says: "Detect Undercut Stock enhances the already powerful stock detection command by analysing previously undetected areas of stock. This option helps to avoid 'fresh-air' cutting, reducing machining time and in some cases by up to half."

The game-changing Waveform Roughing Strategy now gives users the ability to determine the radius size when using the helical approach option, by simply entering maximum and minimum values, which will aid the tool's entry into the component.

Automatic collision detection has been added to the Rough Turning Cycle. In previous versions of the software, it was necessary to manually apply profile extensions to avoid collisions. John Buehler says as users no longer have to do it themselves, time will be saved in initially creating the CAM instructions.

John Buehler says: "An additional benefit is that this new function can be used to produce safer toolpaths in Strategy Manager."

Edgecam 2018 R1 provides support for



deep hole drilling also known as gun drilling. The new strategy empowers the user to control entry, exit and intermediate drilling conditions.

John Buehler says: "This will be particularly important where specialised gun drilling tools are used and the process requires absolutely precise NC code."

The Profiling cycle used in both milling and turning now has two new items of functionality. A Spring Cuts field has been added to the Multi Passes tab, which means tool deflection can be removed where necessary, by adding extra neutral passes, known as Spring Passes. This will be used typically when machining hard materials and repeating the profile pass can result in improved accuracy and surface finish.

Secondly, the new Adjust Feedrate on Arc command improves cycle time calculation. In previous editions of Edgecam, the postprocessor adjusted circular interpolation feedrates, which gave correct NC output, but not the best cycle time calculation.

Support for JT Open files is incorporated for the first time. This is a lightweight 3D model format developed by Siemens PLM Software.

An Editing Manual Milling function provides for editing a manually created milling feature, instead of having to recreate an entire feature when extra edges are required. This is expected to give considerable time savings to Solid Machinist users.

First released in Edgecam 2017 R2, the Edgecam Inspection module has been significantly enhanced, which brings many new features to the software.

John Buehler says: "Considerable progress has been made with the postprocessor development and NC output, through new Code Wizard options. This includes support for Fanuc macros."

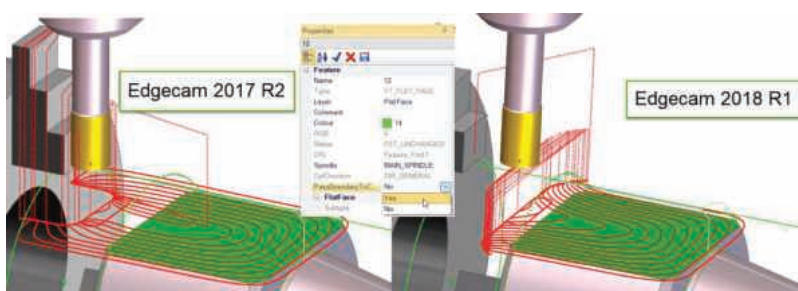
"Users now have full control when editing an Inspection feature, including a calibration technique. They can also determine both feature and properties characteristics."

Edgecam 2018 R1 continues the evolution of updating cycle dialogs with pictures and context-sensitive help, by updating the B-Axis Contouring Cycle, and 3- and 5- axis cycles. This not only assists experienced users to easily interpret an infrequently used command but also helps less familiar users to rapidly understand fundamental functionality.

Another new feature that delivers significant time savings is the Pass Boundary To Cycles function in the Feature Properties window. An improved toolpath is generated when the user engages Current Stock, and picks a solid feature.

John Buehler concludes: "The new datum is more prominent and will change appearance to signify its usage. This is particularly useful when working with multiple component parts, on tombstones and multi-face machining."

Finally, additional functionality has been added to the B-Axis Contouring Cycle, which was introduced in the 2017 R2 edition.



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## Mastercam and WIDIA announce new fast and simple tooling data solution

CNC Software, Inc., developer of Mastercam, has collaborated with WIDIA, the original German tungsten carbide tool manufacturer, to provide a solution that enables CAM users to quickly import tool assemblies from WIDIA NOVO directly into Mastercam 2018.

Mastercam developers worked closely with WIDIA to let users import 3D tool assemblies directly into Mastercam, validate them and save them in their Mastercam file and/or tool library. Features such as automated filtering ensure that the holders and tools that are selected can work together for the particular job. Users of Mastercam benefit from having the correct tooling for the material and for the type of machining operation, plus an accurate 3D model that can be used for visualisation and collision checking, in addition to the time savings.

Rich Taft, product owner, CNC Software Inc, says: "We found that in the past, our customers complained of having to search through big complicated catalogues to find related parts, then having to request or build the assemblies from scratch for use in

systems such as Mastercam. With the integration of WIDIA NOVO and Mastercam, customers save significant time searching for desired tools and building 3D tool assemblies that can be brought directly into Mastercam for easy use by most shops.

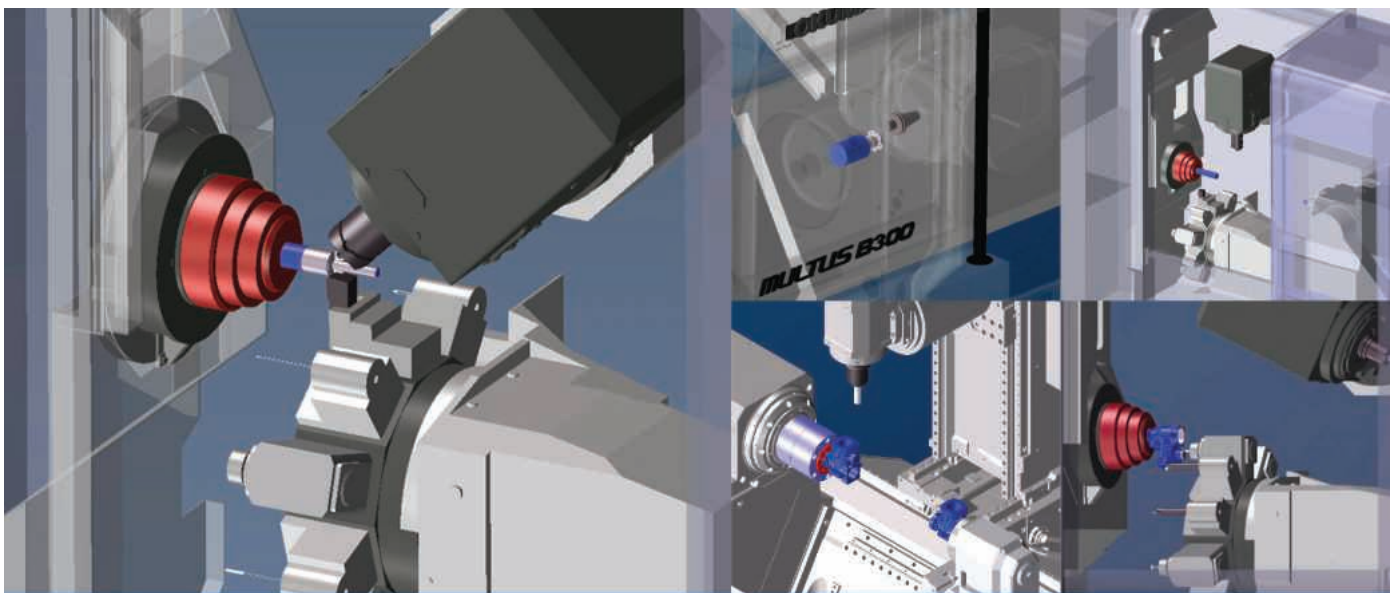
"Accurate tool definitions are a critical factor in modern CAM applications. Toolpath algorithms take advantage of these definitions to provide safe and efficient motion. In addition, the models that we import from WIDIA NOVO help us to generate accurate in-process stock models that can be leveraged in subsequent operations."

Chris Merlin, director of Portfolio Commercialisation at WIDIA, concludes: "One of the promises of digitalisation in manufacturing is greater precision and speed through effective use of data; this is where integration is a must. Users want their systems to work together seamlessly, via simple solutions, without extra effort on their part. By connecting Mastercam and



WIDIA NOVO, users can effortlessly join cutting tool data with machining data. The 3D models, drawings, and starting parameters are easily available for validation and programming processes. All of this leads to less misapplication of tooling solutions, more optimal machining strategies and increased productivity with better quality in the manufacturing environment."

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# CGTech releases VERICUT Version 8.1.2

CGTech is now shipping version 8.1.2 of VERICUT® CNC machine simulation and optimisation software. In addition to new features making it more powerful and easier to use, more than 150 customer-driven enhancements and software requests have been implemented in version 8.1.2.

Tony Shrewsbury, managing director of CGTech Ltd, says: "We have thousands of customers and their needs vary greatly. VERICUT is designed to meet the needs of all types of shops, from the small job shop with simple parts, to the OEM and Tier 1 supplier that regularly pushes the limits of CNC technology. VERICUT is constantly refined to provide the flexibility and tools our customers need."

## VERICUT product and function overview

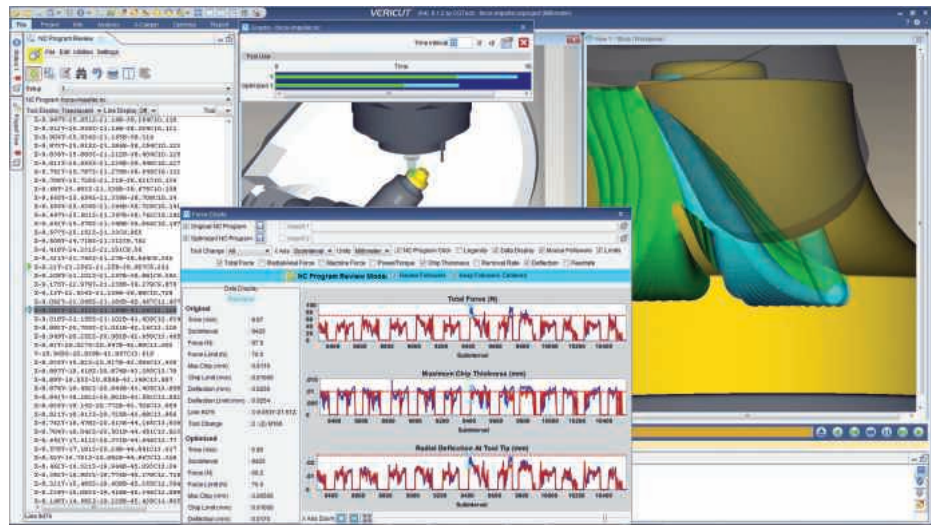
VERICUT is CNC machine simulation, verification and optimisation software that enables users to eliminate the process of manually proving out NC programs. It reduces scrap loss and rework. The program also optimises NC programs in order to both save time and produce higher quality parts that are dimensionally more accurate, and have better surface finish. VERICUT simulates all types of CNC machine tools, including those from leading manufacturers such as DMG MORI, Mazak, Makino, Matsuura, Hermle, Heller, and Chiron. VERICUT runs standalone, and easily integrates with all leading CAM systems such as Dassault Systemes CATIA, Siemens PLM NX CAM, Delcam PowerMill, Vero EdgeCAM, Open Mind hyperMILL, DP Esprit and Missler TopSolidCAM.

## Enhancements in optimisation

Users can optimise more complex NC programs, including looping, branching, IF/THEN, and DO-WHILE code, while retaining all decision-making logic. Optimised NC programs and subroutines are ready to run with no edits by the user. Force Charts that graphically document the cutting process are enhanced with higher fidelity, so they can display even tiny material volumes and forces encountered.

## Other improved features in 8.1.2 include:

- Ability to stop at specific variables when they are set, or changed.
- Options for automatically performing AUTO-DIFF comparisons, and output



summary of AUTO-DIFF results to VERICUT reports.

- Support added for 3DEXPERIENCE 2017X, ESPRIT 2017, NX12.
- New calculation and reporting of Die Sinking electrode contact areas.
- VERICUT Help Library and supporting documents in HTML, this allows for easier navigation, faster searching, and viewing higher quality images at a larger size.
- Enhanced VERICUT and Tool Manager support non-rotating 3D model tools, such as used in ablation, painting, polishing, and other specialised manufacturing processes.
- Enhanced integrations with Zoller and TDM tooling databases to provide access to complex 3D tooling, and ability to select and deselect specific tools for import

## CGTech expands its technical support

As part of the company's continued business growth in the UK and across the globe, CGTech has recently appointed a new technical support engineer to ensure its CNC simulation and optimisation customers receive the highest level of trusted care. A time served apprentice with significant CNC machining experience, Dave Woolams joins CGTech's technical support department offering product guidance for VERICUT users CNC machine model building services and bespoke simulation services.

Having started his career with a small precision engineering business in the South West, he gained valuable experience with various manual and CNC machine tools.

Dave Woolams recalls: "As well as general

engineering we did a lot of engine building and machining for anything from agricultural usage to motorsport. A local performance car garage supported Cosworth race cars, not just blue-printing but high-performance tuning, and we did any machining required. It was a great learning curve for me.

After completing his apprenticeship, he stayed there for about 10 years before joining Renishaw. Having started on the shopfloor as a CNC setter operator in a turning cell at the company's advanced manufacturing facility in Stonehouse, he progressed to its proprietary RAMTIC automated milling and turning section before moving into prototyping and low volume production.

It was here that Dave Woolams started to use CAD/CAM: "We used GibbsCAM as the programming tool for all the low volume work and prototyping that the design engineers would supply as solid models from the Siemens NX CAD/CAM system. After around four years I got the job as CAM development engineer."

He joins CGTech having regularly dealt with VERICUT as part of his previous role for CAM and system control.

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# Creaform releases its latest software platform and application suite

Creaform, a leader in portable 3D measurement solutions and engineering services, has announced the release of VXelements 6.1, the latest version of its 3D software platform and application suite that includes VXmodel and VXinspect. With performance improvements to its dimensional inspection and reverse engineering software modules, users will have an improved user experience and unmatched synergy between the software and the company's portable metrology solutions.

The latest version features a number of major enhancements including:

- VXinspect – Dimensional inspection software module
- Advanced alignment tools: In line with the previous VXelements release, Creaform further improves alignment capabilities by seamlessly integrating geometric counterpart concepts when needed. Completely intelligent, the software deploys its powerful algorithms to build the right alignment when the situation requires it, even if end users are not expert in geometric dimensioning and tolerancing (GD&T).
- New snapshot tool: A new optimised workflow is available, highlighting a strong commitment to software synergy with all Creaform portable 3D scanners, including the HandySCAN 3D.
- VXmodel – Scan-to-CAD software module
- Edit boundaries: The new boundary edition will enable users to boost their



performance. The improved functionality will enable them to get cleaner boundaries and to fit them into 2D entities for more appealing and authentic results.

- Cross sections and cut mesh by plane: Major improvements to the cross-section and cut mesh by plane functionality provide users with the optimum creation workflow. Additional improvements are now applied in the 3D viewer, making interaction with the software and the user experience even better.

Daniel Brown, product management director at Creaform, says: "VXelements gives engineering professionals the most comprehensive and user-friendly toolset for reverse engineering, rapid prototyping and dimensional inspection. With each new release, Creaform continues to evolve to meet customers' rising demands, reinforcing its position as leading metrology

solutions provider of easy to use and powerful hardware and software solutions for reverse engineering and quality control applications."

Creaform develops, manufactures, and sells 3D portable measurement technologies and specialises in engineering services. The company offers innovative solutions, such as 3D scanning, reverse engineering, quality control, non-destructive testing, product development, and numerical simulation (FEA/CFD).

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# Enhanced monitoring and time-saving

Directly exporting key reports into Excel is said to be the major highlight in the latest release of the Javelin production control system from Vero Software. Javelin consultant Chris O'Mara explains that previously reports such as costings, valuation and cost of sales had to be imported into Excel via Crystal Reports.

"In Javelin 2018 R1, when you create reports that include the job cost sheet, cost of sales, stock valuation and work in progress, amongst others, there's now the option to export them directly to Excel."

He says that with many customers being accounts driven, Excel is their "Go To" tool, and this new function is a faster and more flexible way of transferring information from Javelin. There are around 25 items of new and enhanced functionality in the new edition of the software, including a revamped maintenance screen.

Chris O'Mara continues: "We've pulled information from four screens into one overall maintenance screen. This is particularly useful for resolving hung bookings. For example, if an incorrect quantity has been booked in on the shop floor, or an operator starts or ends a job which has already been checked as complete, a warning shows on the screen and highlights what the actual issue is."

He says that manufacturers often face issues of incorrect quantities being booked, but this enhancement provides a quick and simple solution:

"Just click on the WIP bookings, see who's inputted it and reopen operations to process the hung booking. You can run a validation report and the WIP validation process to clear all hung bookings from the one screen."

Continuing a process begun in 2017 R2, triggers are now available for capturing all movement of data. For example, if

amendments are made to a works order, the trigger captures what has been altered, what the old and new values are, who carried it out, and the date and time. The function needs to be switched on by a Javelin consultant, and has now been extended to include works orders, materials, operations, sales order comments, purchase order comments, if a part is put on hold, and new drawings.



Type	TableName	PK	FieldName	OldValue	NewValue	UpdateDate	UserName	AuditID
U	Part	AS-240V-3PIN-BLK	Lead_Time_Days	5	4	2017-09-26 13:47:11	HM-EUcomara	33
U	Issue_History_File	AS-240V-3PIN-GLD/FP1 /	Hold	0	1	2017-09-26 13:07:29	HM-EUcomara	32
U	Issue_History_File	AS-240V-3PIN-GLD/FP1 /	Orig_Iss	A	B	2017-09-26 13:07:29	HM-EUcomara	31
I	PO_Detail_Comments	PRN0050028/1/53002/Sep 26 2017 1:01PM/	PO_No	NULL	PRN0050028	2017-09-26 13:01:53	HM-EUcomara	30
U	Materials	10051US-PLS-003A\	Qty_Std	4.0000	5.0000	2017-09-26 12:58:16	HM-EUcomara	28

TableName	PK	FieldName	OldValue	NewValue	UpdateDate	UserName
Part	AS-240V-3PIN-BLK	Lead_Time_Days	5	4	26/09/2017 13:47:11	HM-EUcomara
Issue_History	AS-240V-3PIN-GLD/FP1 /	Hold	0	1	26/09/2017 13:07:29	HM-EUcomara
Issue_History_File	AS-240V-3PIN-GLD/FP1 /	Orig_Iss	A	B	26/09/2017 13:07:29	HM-EUcomara
PO_Detail	PRN0050028/1/53002/Sep 26 2017 1:01PM/	PO_No		PRN0050028	26/09/2017 13:01:53	HM-EUcomara
Materials	10051US-PLS-003A\	Qty_Std	4.0000	5.0000	26/09/2017 12:58:16	HM-EUcomara
PO_Detail	SUB0030007/1/	Mod_Since_Last_Print		SUB0030007	21/09/2017 15:03:23	HM-EUcomara
PO_Detail	SUB0030007/1/	PO_No		SUB0030007	21/09/2017 14:58:02	HM-EUcomara
Ops	10105/40s	WO_No	10105		21/09/2017 14:55:16	HM-EUcomara
Ops	10109/30s	WO_No	10105		21/09/2017 14:55:03	HM-EUcomara

Chris O'Mara says: "It's a key element of being able to monitor the knock-on effect of changing the field, allowing you to view total system usage."

The Item Type Defaults function does away with the need to re-key information. When a part is being created it can be given an item type, which defaults a number of key part fields. This has been extended in Javelin 2018 R1 to include store location, cure date, life category, configured part, and configured component.

A range of documents and drawings are attached to the purchase order email as it is sent out. This includes CAD files, Excel files, Word documents and certifications. There is also a function in Javelin 2018 R1 which automatically identifies a customer's specific contact to receive an invoice email, instead of it being sent to the person named on the sales order.

Overall, the system works with three types of cutting tool which are tracked, consumable and durable. Major enhancements give more control to the machine operator, meaning they no longer have to wait for a supervisor to issue tracked tools, as these can now be assigned directly from shop floor data

capture. Tracked tools differ from consumables, which are simply listed tools, in that they are monitored for cycle counts and calibration while being used.

There is also a new tool type in the latest release known as durable, which allows multiple quantities of the same tool to be generated.

Chris O'Mara says: "Durable tools don't have to be linked to work orders, and the system's flexibility allows users to assign tools to different areas of the job process, such as employee and outwork, as well as the work order. Javelin records whichever area the tool is assigned to."

In conclusion, he expects the most popular enhancement to be the ability to export key reports into Excel; in the same way that a feature was particularly well-received in the previous release, to create multiple lines in quotations showing how the estimate was arrived at.

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## Measurement magic points the way to business growth

A firm that produces precision components for the aerospace sector is going from strength to strength with a helping hand from experts in South Derbyshire. Trust Precision Engineering has invested heavily in its operations over the past few years, meaning it is now turning out vastly increased volumes for a growing portfolio of customers.

However, the Nottingham-based company works to such tight tolerances that it was faced with the challenge of finding a way to accurately measure its parts and ensure that they continued to meet the high expectations of clients.

To address the challenge Trust turned to VICIVISION UK, part of the Foston-based Carfulan Group and a leading supplier of optical, non-contact turned-part measurement machines and quality control systems.

Dedicated to improving efficiency in production, reducing down time and increasing productivity, VICIVISION UK machines use a combination of video and light projection, providing top-of-the-range measuring performance in a practical,

robust and compact design compatible with shop-floor environments.

Nick Street, managing director of Trust Precision Engineering, says: "The amount of components we were producing meant we were struggling to keep up with the amount of inspections we would like to have done on a component. There was an obvious need for extra equipment.

"When researching I came across VICIVISION UK. The machine specifications were impressive, the speed and the ease of programming and the actual inspection time was very quick, and it covered everything."

Trust Precision Engineering purchased two M304 Techno machines, which provide benchmark reliability in measuring cylindrical parts and enable fast and efficient batch changing.

Their design makes immediate inspection available next to multiple machining centres, to more than one operator, bringing about a reduction in down time as there is no need to leave the production environment.

Nick Street says: "The VICIVISION machines really are fantastic pieces of



equipment and mean every dimension of a part is checked and there's nothing left to chance.

"It's one less thing for me to worry about and gives me complete confidence in what we're doing."

Graham Shaw, sales manager at VICIVISION UK, says: "Trust Precision Engineering had very strict criteria to meet and, by working closely with them, we were delighted to be able to deliver exactly what they were looking for to enable them to continue to take on more work."

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## Additive manufacture of roller bearing components

The German group Schaeffler Technologies, that manufactures roller bearings for automotive, aerospace and industrial applications and owns the INA and FAG brands amongst others, has entered into a cooperation project with global machine tool manufacturer DMG MORI. It is testing suitable metals to advance the development of additively manufactured roller bearing components with the aim of realising optimised products that offer greater added value for end customers.

Since May 2017, Schaeffler has been using a DMG MORI LASERTEC 65 3D hybrid machine to produce one-offs and small batches of bearing components as well as spare parts in metallic functionally graded materials (FGM) to finished part quality. The rapid, one-hit process combines the flexibility of additive manufacturing by laser deposition welding with 5-axis subtractive milling.

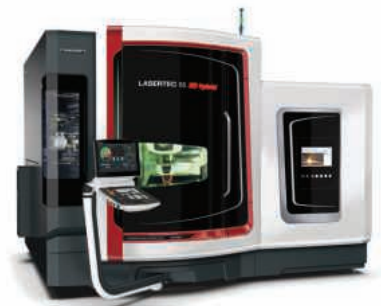
Schaeffler was not new to generative manufacturing, as it already used 3D powder bed printers for making plastic

prototypes and fixtures and for small series production.

The LASERTEC 65 3D hybrid is equipped with a twin powder feed that allows changeover from deposition of one material to another. It results in a smooth transition between materials with different properties. The toughness and hardness of the material can be regulated during the build and optimally tailored to the specific requirements of each application.

Schaeffler has been active in Formula E for many years and is working on further improvements in electric drives. Material gradation offers exciting opportunities for development. Magnetic and non-magnetic materials could, for example, be combined in a component using FGM and the properties adjusted as required.

Patrick Diederich, managing director of SAUER GmbH, who is also responsible for advanced technologies at DMG MORI, says: "We are very pleased that Schaeffler has decided on a LASERTEC 65 3D hybrid. Our strong partnership brings about a



fascinating synergy in the production of additively manufactured components. Schaeffler was awarded the accolade of overall winner in DMG MORI's Partner Award 2017."

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# Investment in PSL Datatrack during new start for Newtech

In early 2017, Newtech High Speed Turning Ltd (Newtech) decided to move to better premises at its base in Kirkby, Liverpool. It seemed the right time for the company owners to finally invest in PSL Datatrack production control software.

Director Alan Riley, says: "It had been on the cards for a while and with the relocation we knew it was the right time to make the investment. I wish we had made it years ago."

Alan Riley had been aware, through an industry colleague in a similar subcontract engineering business, of how PSL Datatrack software could transform and improve business administration of a small company.

"He gave me a demonstration of PSL Datatrack and I could see immediately how it could improve greatly upon our existing setup which was based on an unsatisfactory combination of accounting software and spreadsheets."

Newtech had been using that setup for about 15 years and its drawbacks were clear, too much re-entering of customer information, too many double entries and mistakes, too much time spent on re-quotes.

"These were all issues that I guess any small subcontract precision engineering business can face and at some stage they have to be addressed. Our move was the perfect time for us, so we could start afresh. We wanted to ensure that our customers could see for themselves how we were trying to live up to our motto of applying professionalism, giving high customer service standards and having a continuous investment strategy to deliver products to them that we are proud of."

With everything else going on with the move to the new premises, with a vastly superior layout and offering potential for planned new machine tool investments, Alan Riley was a little concerned about the time the installation of PSL Datatrack might require.

Alan Riley continues: "I need not have worried. The installation was very smooth and handled remotely by PSL Datatrack who simply took over control of my computer and led me through the installation. The training was the same and the learning curve was not at all steep. There are two of us in



the company who gained a thorough understanding of how to use the software within a matter of weeks. There are, of course, always new elements to discover, thanks to the versatility of PSL Datatrack and we get good telephone guidance."

Initially, Newtech has used PSL Datatrack modules to focus on the key areas relating to improving customer service. The company produces turned parts in one-offs through to batches of 20,000 for a vast range of customers in industries as varied as defence, electronics, automotive, food processing and fabrication.

Many of the customers' orders are repeats or have slight changes in terms of material specifications or quantities. These can now be dealt with much more easily as PSL Datatrack gives them the facility to call up previous orders and quickly make the required changes before quoting.

Alan Riley confirms: "It's so much quicker and more accurate than having to requote from scratch."

The shop floor now knows precisely what must be made and when, including what time has to be allocated on individual turning or milling machines.

PSL Datatrack is used to manage a Kanban stock system to ensure that specific

parts are readily available to fulfil delivery of parts to any customer, as well as providing instant information relating to the status of any order.

In terms of quality, Newtech has noticed an increase in the need for traceability from all customer sectors and maintaining production quality is high on the company's agenda.

Alan Riley says: "With PSL Datatrack, a works order to the shop floor is always accompanied by a quality inspection sheet that has to be filled out by everyone concerned in fulfilling the order. This makes a major contribution to ensuring full traceability."

With its initial investment in PSL Datatrack production control software, managing quotations, sales and purchase order processing, material and stock control, Newtech High Speed Turning is now set up for working successfully out of its new premises.

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# More precision for additive manufacturing

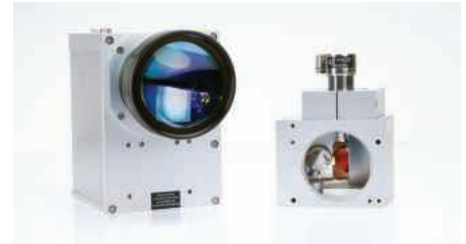
## New digital-encoder-equipped 2D scan heads for larger working volumes

Laser beam deflection and positioning expert SCANLAB GmbH is rounding out its tried-and-proven intelliSCAN product family. The soon to be available intelliSCANse 20 and 30 scan heads are systems with 20 and 30 mm apertures for a larger working field. Their integrated digital encoder technology ensures highest dynamics along with high resolution and best long-term stability. These factors make the systems especially interesting for demanding applications such as 3D printing, micro-structuring and micro-processing. An attractive price/performance ratio underscores the systems' suitability for efficient industrial usage.

Scan systems need especially high processing precision to tackle challenging applications such as laser sintering of metals in additive manufacturing, or laser processing of displays and semiconductors, as well as structuring of diodes. These applications' key factors for end-product quality are linearity and low drift.

To address those requirements even more effectively, SCANLAB is extending its market-proven intelliSCAN product family. The intelliSCANse 20 and 30, both equipped with high-performance dynAXISse L galvanometer scanners, can now fulfil the market's demand for large-aperture systems. These are designed to enable larger working volumes with unchanged spot sizes. The integrated digital se-encoder technology guarantees outstanding precision and dynamics while enabling maximum throughput.

As with all other scan heads of the intelliSCAN family, the new systems, too, are versatile in usage and offer various specific tunings, as well as diverse cooling options, mechanics, add-on variants and a full complement of proven interfaces. In terms of price, however, these premium scan heads remain down to earth. Test systems can be ordered effective immediately and series production is scheduled for early 2018.



With over 30,000 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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## GE Additive unveils first BETA machine from its Project Atlas program

GE Additive has unveiled the first BETA machine developed as part of its Project A.T.L.A.S program. The metre-class, laser powder-bed fusion machine has been developed to provide manufacturers of large parts and components with a scalable solution that can be configured and customised to their own specific industry applications.

Project A.T.L.A.S (Additive Technology Large Area System) is GE Additive's company-wide program to develop the next generation large additive machines. This first BETA machine was developed in just nine months and complements the company's existing portfolio of products.

Ideally suited to industries that require large complex metal parts, such as aviation, automotive, space and oil and gas industries, the new BETA machine builds on technology previously developed by GE, combined with Concept Laser's expertise in laser additive machines. The first few BETA machines are currently being evaluated by a small group of customers and more are available for delivery in 2018.

The machine's feature resolution and

build rate speeds are better than machines available today and it has a scalable architecture that can increase the 'Z' axis to 1.0 m and beyond.

Well-suited for large components with high resolution and complex geometries, such as aerospace-class parts, the machine incorporates the latest laser technology and the ability to be reconfigured to incorporate additional lasers, as well as discrete dosing to save on powder and cost.

Frank Herzog, founder and CEO of Concept Laser, says: "Bringing innovation and technologies to market in just nine months demonstrates exactly what we mean by accelerating the additive manufacturing industry. Our Project A.T.L.A.S is one way we are helping our customers be more efficient and nimble as the sector matures. This demonstrates what's possible when we combine the strength of Concept Laser with GE."

For many years, GE has been a leading end user and innovator in the additive manufacturing space. In addition to the \$1.4 billion investment in Concept Laser and Arcam, GE has also invested approximately



\$1.5 billion in manufacturing and additive technologies over the past 10 years, developed additive applications across all GE businesses, created new services applications across the company, and earned hundreds of patents in material science. In 2016, the company established GE Additive to become a leading supplier of additive technology, materials and services for industries and businesses worldwide.

**GE Additive**  
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# Successfully re-engineered for maximised benefit

The new LPS-T compact longitudinal plate saw with vertical bandsaw blade from Behringer has proved to be a resounding success. Behringer GmbH put its proven specialist machine for toolmaking, test cutting and for small parts and blocks on the test stand, and implemented a number of user-friendly variations of some of its features. The new LPS T vertical bandsawing machine has emerged significantly matured and ideally equipped to meet the challenges of the future.

The LPS-T comes with a linear-guided material table with a support surface of 1,260 x 1,260 mm, which allows flexible positioning and clamping of the material to be cut. This is achieved using T-grooves in the table, which enable the optimum positioning of fixtures or clamps.

A new feature is the optional NC measuring device which significantly simplifies setup processes. After entering the required cutting depth, the measuring device enables automatic positioning. The material can be rapidly placed and aligned, ensuring greater flexibility and higher precision during the day-to-day work of the machine.

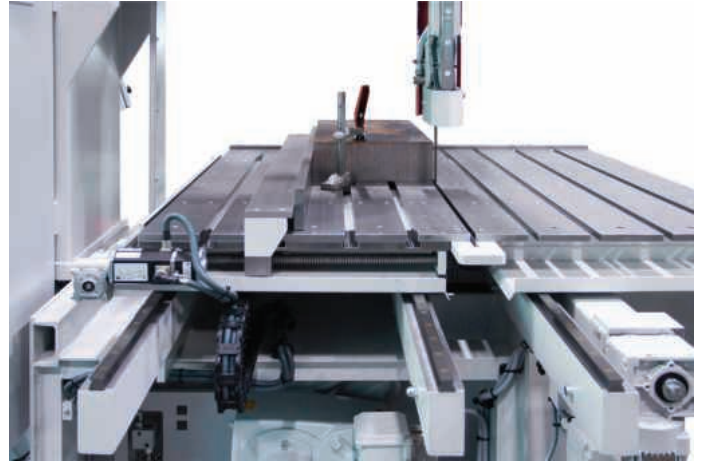
### Ergonomic design

Both the panel saw and the NC measuring device are controlled by an ergonomically designed and easy-to-operate touch control panel. The self-explanatory symbol-based menu system makes for faster familiarisation of new operators and simplifies machine handling.

Saw feed in the LPS-T takes place using ball screws with servo drive. A cutting pressure control system links the servo feed to a sensitive cutting pressure regulation system. This produces a constant level of chip removal, overall higher cutting outputs than is possible using conventional systems and reliable overload protection of the saw blade. The result: reduced cutting costs due to a longer bandsaw service life.

The bimetal or carbide saw blade is driven as standard at 4 kW and runs over wear-proof band wheels. All blade guidance parts are made of vibration-proof grey cast iron. Bandsaw changeover has also now been made even easier, and can be completed in around two minutes without the aid of tools by a single operator.

Electrically powered chip brushes arranged on both sides clear the saw blade of adhering chips synchronously to the bandsaw



speed, a substantial benefit when it comes to maximising blade service life. The machine is fitted as standard with a cooling lubricant system for feeding emulsion, and an environmentally friendly micro-dispensing device can be additionally mounted.

### As flexible as your needs

The LPS vertical plate saw series from Behringer provide superb flexibility and cutting output and are the perfect answer when it comes producing cuts in all plate dimensions and thicknesses with optimised contours and machining allowances. LPS bandsaws can be ideally tailored to meet your specific needs. The material table is structured using platform technology and can be variably equipped in 250 mm graduations with cover plates, liftable roller conveyor segments, recesses for crane loading on chains or measurement and clamping devices. Every machine is unique to its owner.

### Precision and speed

LPS vertical bandsaws can cut even materials with different machining properties with the utmost precision without compromising on speed. This is made possible by a durable design in combination with vibration-damping grey cast iron components. Saw feed is performed here by a ball screw with servo drive and the sensitive Behringer cutting pressure control system.

### Effective chip disposal

Anyone considering high-performance metal cutting needs to think about disposal of the produced chips. Behringer LPS bandsaws offer a solution which is as efficient as it is convenient. Underneath the sawing unit, directly in the direction of chip flow, is a generously dimensioned chip conveyor with integrated coolant tank to intercept and separate produced chips and coolant. For efficient cleaning and maintenance, the conveyor is equipped with casters to allow it to be conveniently rolled out of the machine frame. A high-efficiency chip brushing system clears the blade of any adhering chips. The brushes rest against the blade and clear adhering chips out of the chip space.



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# A Mega success

## Rapid sawing of nickel steel billets achieved with new Prosaw Mega bandsaws

Located in the "Steel City" of Sheffield, Special Quality Alloys Ltd is a market leading supplier of forged products, bar and machined components in nickel-based alloys, duplex, super duplex, stainless steels and carbon and alloy grades principally for the oil and gas, power generation, aerospace and general engineering industry around the world. The company holds approvals required by the oil and gas industry including ISO 9001, ISO 14001 as well as numerous end user approvals.

Part of the Special Steel Group, Special Quality Alloys was delighted to have been requested to produce a total of 35,000 bars to be cut to size from billets, forming part of a single individual project.

The company had previously purchased a number of saws from Prosaw, but this specialised rapid sawing application was so intensive that three brand new saws were required in order to fulfil the demand.

Firstly, Prosaw supplied a Mega BS330HAS heavy duty automatic bandsaw



to the company, which has been fully employed cutting the billets for seven days a week since installation. This machine has been supplemented with two further machines from Prosaw, a Mega H-460A heavy duty automatic twin column bandsaw and a second Mega 330HAS Automatic. All three Mega saws are perfectly capable of superfast cutting of the high Rockwell hardness nickel steel billets.

Special Quality Alloys' operations director Dean Matthews expressed his satisfaction with the service given to this project by Prosaw as well as with the performance of the bandsaws: "These saws have proved

themselves to be very reliable in what has been intensive service and have established their capability in efficiently and accurately handling a very challenging material."

"All three Mega saws are demonstrably reliable in service, which of course reduces the frequency of any servicing that might be required, which in turn reduces both down time and servicing costs."

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# High-performance bandsaw halves cutting times

Sawing tough, highly tempered steel bar for a medical engineering application presented a challenge to Bavarian tool and workshop equipment manufacturer, Werner Weitner, as cutting times were long. Installation of a KASTOwin pro AC 5.6 high-performance bandsaw has made production considerably more efficient by halving processing times.

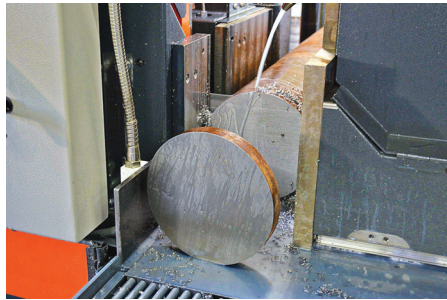
Launched in 2016, the machine is designed for a variety of applications in steel stockholding, steel production, forging mills, machine manufacturing and the automotive industry. A notable feature is the frequency-controlled, 11 kW drive motor, which allows carbide as well as bimetal blades to be used. Users can therefore be flexible in their choice of tool, reducing costs and optimising cutting speed and efficiency.



Various automatic bandsaws from the KASTOwin, KASTOerto and KASTOfunctional ranges are in use at Werner Weitner GmbH

Founded in Eichstätt in 1968, family-run Werner Weitner has developed from a metal fabricator to become a 260-employee, €30 million turnover supplier to the international automotive industry and medical engineering sector. The largest business area is the development, production and sale of special tools used in vehicle manufacturers' authorised repair shops. Materials processed in the 15,000 sq metres factory are mainly steels and alloys, but also aluminium and plastics.

Sawing equipment has been sourced from KASTO since 1994 to meet cutting requirements ranging from one-off prototypes to high volumes. Automatic bandsaws from the KASTOwin, KASTOerto and KASTOfunctional ranges are in use throughout the company, so it was no surprise that Werner Weitner returned to its preferred supplier to meet a new sawing challenge.



The cutting range of the KASTOwin pro AC 5.6 is 560 mm. Werner Weitner uses the saw mainly for material diameters of 100 to 350 mm

Departmental manager Florian Winhard says: "We had to process a highly tempered V2A (304 stainless) steel over a large range of diameters for a medical engineering customer. Our existing saws could only use bimetal blades, so cutting times were up to 15 minutes, which we felt was unsatisfactory.

"So we sent a material sample to KASTO to carry out trials on different saws. The results obtained on the KASTOwin pro AC 5.6 automatic bandsaw using a carbide blade were impressive. Cycle times of seven to eight minutes were achieved, around half the time needed by our other saws. We bought it in March 2017, as we needed extra cutting capacity anyway.

"A major advantage for us is that we can switch between carbide blades and less expensive high speed steel bimetal blades at any time, so we can cut not only difficult-to-machine materials but also standard steels economically."

The innovative feed system is adjusted steplessly and precisely by two independently servo-driven ballscrews. The bandsaw also has a unit in front and behind the cutting plane that ensures the band is clear of the sawn surfaces when the cutting



Thanks to the powerful coolant pump and large coolant tank, the saw blade is protected even when cutting difficult-to-machine materials

head moves up, prolonging tool life and avoiding marking the cut surfaces.

The working range of the KASTOwin pro is 560 mm and the smallest dimension that can be cut is 25 by 25 mm, although Werner Weitner uses the saw mainly for cutting material diameters from 100 to 350 mm. The shortest remnant length is small at 10 mm for individual cuts and 35 mm for automatic operation, enabling the tool specialist to minimise waste.

The saw head has a heavy, torsionally rigid, welded structure, ensuring quiet operation and vibration-free operation. Thanks to the powerful coolant pump and large coolant tank, blades are protected even when processing difficult-to-machine materials.



The KASTO EasyControl enables intuitive operation of the machine via the touch screen

The saw is equipped with KASTO's own EasyControl CNC system. It is simple to use and reduces idle times in automatic operation for maximum cutting performance. All parameters can be optimised to match the material, its cross section and the type of blade being used. Order quantities are input on the touch-screen display and the material to be sawn is placed manually or by means of an overhead crane on a roller track that feeds the machine. When the job is finished, the cut pieces are removed by hand and sent for machining.

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# Everising machines really are proven in production

Midlands-based steel stockholder Steel Express, established in 2001, is currently enjoying a boost to business, truly putting its production machinery to the test. The growing business has recently launched a new online ordering service to increase order process efficiency for its national customer base.

Mark Nicholls, managing director for Steel Express contributes the success in part to its choice of sawing machinery and the fast turn-around times.

Mark Nicholls says: "We started dealing with scrap metal from factories and have now grown into a trusted steel stockholder operating on a national basis and this is, in part, down to the Everising bandsaws we use for producing our products. They have helped us grow into what we are today, and Addison Saws have been there to provide a guiding hand and help us keep our costs down. We really do work all our machines incredibly hard, which is a testament to their robustness. If they can keep up with our production schedule, they are definitely good enough for anyone."



Mark Nicholls currently runs five Everising bandsaws in his Wolverhampton-based factory, four of which are H460 HA-NC Twin Pillar automatic bandsaws with a cutting capacity of 460 mm and the other, a H560 HA-NC Twin Pillar automatic bandsaw with a larger capacity of 560 mm for larger steel pieces, furthermore all machines are run at full capacity all day, every day. The original Everising saw, bought eight years ago, is still going strong.

Mark Nicholls says: "We never have major problems with these machines, resulting in much less downtime in general. We'd go back to Addison to buy Everising every time,

as they'll cut the toughest of materials, which is just what we need."

The new online service from Steel Express is projected to stimulate growth by 15 percent over the first year and Steel Express is already discussing adding a sixth Everising H460 HA-NC to its production line to accommodate a further increase in demand from its new online service, which can be found at [www.steelexpress.co.uk/shop](http://www.steelexpress.co.uk/shop)

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# Kjellberg Finsterwalde goes into the future of plasma cutting

New approaches on the topic of Industry 4.0 focus on the user

In the metalworking industry, there are various approaches on the topic of Industry 4.0. For Kjellberg Finsterwalde any consideration on this topic puts the user at the heart of the discussions in order to increase productivity and make work processes easier. The latest results of corresponding development work were presented at the recent trade fair for welding and cutting, Schweissen und Schneiden.

### New generation Q power sources

The new generation Q power sources demonstrate how networking and communication will change production processes in the future. According to the requirements of Industry 4.0, the modular designed power source can form networks and exchange information with their own as well as other components. The emphasis is on digital process monitoring and control as well as the possibility of remote access. Kjellberg Finsterwalde has therefore developed an extensive operation interface for the user that is device independent and location independent. This was shown for the first time at Schweissen und Schneiden.

Kjellberg Finsterwalde has been developing and producing special plasma torches for bevel cutting for more than 20 years. The high quality and robustness of these burners enables high-precision and reproducible bevel cuts. A new addition to the family of plasma torches, the PB-S75 WF, was also presented at the show, that can be used for multiple bevel cuts up to 60°. Due to its particularly flat design, the burner is suitable for straight and bevel cuts even with limited accessibility, for example profiles). When used on multi-burn chamfering machines, the work steps are reduced, thereby increasing productivity.



In addition to this, Kjellberg Finsterwalde will in future provide bevel cutting data for the preparation of sheets from 5 to 30 mm under the name PerfectBevel. With the really assessed reference values of the database, it is possible to achieve precise bevel cuts quickly and easily in the Contour Cut quality for mild steel, stainless steel and aluminum. Taking optimum weld preparation and depending on the material and material thickness, compensation values are specified for V, Y, X and K welds. The high accuracy and reproducibility reduces the material usage for welding and increases productivity, as the waste and therefore reworking can be minimised. The PerfectBevel cutting database is available for all machines in the HiFocus and Smart Focus series.

### Plasma cutting does not have to be loud with Silent Cut

Due to the high energy densities and flow velocities during high-quality plasma cutting, the sound level can exceed 100 dB (A) depending on the cutting task. Kjellberg Finsterwalde now offers a solution to reduce the noise exposure, which is perceived as disturbing for human hearing in the upper frequency range.

As a further development of the patented Contour Cut technology, Silent Cut reduces the sound pressure level by up to 15 dB (A) during plasma cutting of mild steels with a material thickness between 4 and 30 mm in the current range between 60 to 160 A.



Even the high frequencies, which are perceived as particularly disturbing, are considerably reduced. The reduction of the sound level by 10 decibels is already perceived by human hearing as a halving of the loudness. Thus, Silent Cut makes an important contribution to health and safety at work, while maintaining high cut quality.

Kjellberg's intensive development work forms the foundation of Silent Cut technology. The result is a unique combination of new consumables and new cutting data, allowing the user to cut holes, bars and contours with similarly high quality as with Contour Cut and to benefit from a considerably reduced sound pressure level. Due to the easy change of consumables and the use of the Silent Cut database, the technology can be used with existing systems.

Silent Cut is now available for the Smart Focus plasma series and for the HiFocus neo.

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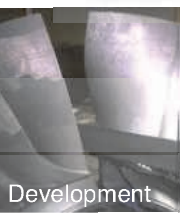
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# Fastest cut speed of any thickness of material

New plasma cutter offers highest power-to-weight ratio and high visibility display

ESAB Welding & Cutting Products has announced the availability of its new Cutmaster® 60i handheld air plasma cutting system. Cutmaster 60i is a 3-phase, 400 V unit that weighs 16.8 kg and provides a rated output of 7.6 kW at 50 percent duty cycle at 60 A. It produces a recommended cut of 16 mm, has a maximum sever thickness of 38 mm and provides the fastest cut speed at any thickness material for its class. The Cutmaster 60i system includes the new SL60QD™ 1Torch®, which offers a quick disconnect feature enabling selective replacement of either the torch handle assembly or torch leads at a lower cost than replacing both together, a necessity with one-piece torch/lead assemblies.

As part of the time-tested 1Torch family with patented SureLok® technology, wear parts are readily available. Cost of ownership is reduced by minimising the number of wear parts required in inventory, as well as the fewest number of wear parts to replace, facilitating quick changeover at a lower cost.

Gas optimiser technology helps ensure premium cut quality and performance by precisely regulating air pressure, yet also allows users to manually adjust gas delivery pressure to their liking. When users set amperage, mode of operation, torch type, and add torch lengths to extend cutting reach by an additional 7.6, 15.2 or 22.9 m, the machine uses its colour display to provide recommended gas pressure settings, which ensures optimum cutting performance.

Typical users range from general manufacturing to mobile fabrication, farm/agricultural, construction, maintenance and repair, automotive bodies and frames, HVAC and training facilities.

Instead of a single handle or a roll cage, Cutmaster 60i boasts an integral four-handle design that makes it easier to lift the unit in and out of storage spaces and carry it around job sites. Passing extensive drop tests on multiple impact points, the handles also add protection, create a slimmer profile for easier storage and give users a way to wrap the work clamp and torch around the unit when moving it. The work cable now uses a standard 50 mm OKC connection for fast setup and removal. Similarly, the air filter and input power cable can be replaced via easy access on the back panel, simplifying and improving operations from a Total Productive Maintenance (TPM) perspective.

In addition to the Cutmaster 60i, the series includes the Cutmaster 80, 100 and 120 and share common features. These include a tubular "roll bar" that protect the front and rear of the power supply for durability, as well as make the unit easier to carry. A trigger latch feature prevents hand fatigue during longer cuts, as it allows the operator to release the trigger while the system keeps cutting. Colour-coded LEDs on the front panel indicate pressure status and setup errors. The Auto Pilot Restart feature instantly reignites the pilot arc while cutting expanded metals such as grates and chain link fences. Each unit comes standard with the industry-leading 1Torch (6.1 or 15.2 m cable options), but they also accept mechanised and automated torches. Primary power options are 50/60 Hz, 400 V, 3-ph CE unit.

### Product highlights include the following:

- ESAB Cutmaster 80 features an 80 A output, has a genuine cut of 25 mm and severance cut of 38 mm. It also weighs just 19.5 kg.



The new Cutmaster 60i provides the industry's highest power-to-weight ratio in its class and features an over-sized digital interface that communicates more information, helping users optimise cut quality

- ESAB Cutmaster 100 features a 100 A output, has a genuine cut of 35 mm and severance cut of 45 mm and weighs 28.1 kg.
- ESAB Cutmaster 120 features a 120 A output, has a genuine cut of 40 mm and severance cut of 55 mm and weighs 28.1 kg.

ESAB Welding & Cutting Products is a recognised leader in the welding and cutting industry. From time-honoured processes in welding and cutting to revolutionary technologies in mechanised cutting and automation, ESAB's welding consumables, equipment, and accessories bring solutions to customers around the globe.

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# High-performance plasma pipe cutting

HGG 3D profiling plasma pipe cutting machines boost productivity and reduce production costs and fabrication time in some of the world's most demanding structural and production applications

HGG high performance plasma pipe cutting machines can cut the most complicated shapes on a pipe or tube extremely accurately and with a bevel and plate slots. This precise weld preparation significantly increases productivity, simplifies the welding process, enhances the integrity of the weld and reduces fabrication time, ensuring that even the most complex connections can be created on a large range of pipe sizes in various metals and alloys.

HGG not only develops and builds customised CNC cutting machines for 3D profiling but all their machines have a number of unique features.

HGG's unique plasma features and software allows for precise torch-to-material distance control which prevents cutting torch collisions, cutting deviation and ensures a constant arc is maintained throughout the cutting process. Kerf width

compensation is included in all CNC pipe cutting routines to compensate the arc thickness for greater accuracy.

In dealing with greater wall thickness in the pipe, where the shape of the arc can influence the accuracy of the cut, HGG machines incorporate an advanced angular compensation facility to correct inaccuracies due to arc convergence. These features are unique to the industry and only available on HGG's machinery, made possible by the fact that all software is developed in-house.

Every machine in the HGG range incorporates this very latest advanced technology and comes with oxy fuel, plasma, marking and CAD-CAM Interfaces.

HGG machines have now been used successfully on many applications including wind turbines, mobile telecom towers, offshore rigs and platforms, construction projects, bridges, shipbuilding, production



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# J H Lavender celebrates 100 years of trading with prestigious award

On the 14th of December 2017, West Midlands-based casting company J H Lavender was presented with the prestigious JLRQ award by key members of the JLR Supplier Technical Assistance team at its base in West Bromwich. The JLR STA team led by senior manager Bob Jay congratulated J H Lavender's employees on this wonderful achievement.

The JLRQ award recognises J H Lavender's commitment to delivering outstanding performance in respect of quality, cost and on time delivery performance to Jaguar Land Rover. JHL is justifiably proud to join a very select few UK companies that currently hold this award. The presentation was made to JHL managing director Ian Timings and technical operations manager Mark Lewis. Both Bob Jay and Ian Timings addressed the JHL workforce stressing the vital input of every employee within the Lavender team in achieving this level of excellence with Ian stating:

"Such awards cannot be attained without the dedication of the whole team. 2017 was a key year for the development of the company and marks real progress in us working towards our long-term goals and aspirations. It signified a milestone for us in a number of ways and we feel this accolade further cements our position as a key supplier to the UK automotive industry. The achievement of JLRQ is fantastic news for the company and justified recognition for the consistent and excellent work ethic of our employees. The strength and depth of skills of the team have been key to us achieving this award and I would like to thank every employee for their efforts in the journey to this point. The fact that we have received this award in our centenary year makes it all the more special."

J H Lavender secured its first JLR business in 2010 with production volumes

commencing in 2011. The journey towards JLRQ has gathered momentum ever since, resulting in them becoming the only privately-owned manufacturer of aluminum gravity and pressure die castings in the UK to hold this award today. JHL supplies a combination of both machined and assembled products to numerous JLR plants both in the UK and overseas for many different vehicles.

Further underpinning the company's progress has been the achievement of additional quality accreditations to support

position as we have a solid foundation to support our continued growth and expansion into our 101st year of manufacturing. Our first target is the completion of our new machining facility due by the end of Quarter 1 2018. This brand new bespoke facility will be dedicated to the machining and assembly of high integrity parts primarily for the automotive market. The new facility will provide additional capacity to allow us to expand our operations with both existing and new customers alike. We have everything the



From left to right we have Craig Hughes (JLR), Ian Timings (MD JHL), Mark Lewis (technical operations manager - JHL), Bob Jay (JLR STA) & David Limmer (JLR STA)

a wide range of customer requirements. The achievement of recent IATF16949/2016 and ISO9001 upgrades further supports the business development strategy to widen their customer base and secure new contracts with both existing and prospective new customers alike. Add to this a £6 million investment in plant and equipment since 2012 and there is every reason to be positive about the future of the company. MD Ian Timings concludes:

"The company is now in a very strong

automotive industry needs: skills, quality systems, engineering expertise, technical support and the facilities to back it all up. For us 2018 is set to be a year of exciting opportunity."

**J H Lavender & Co Ltd**  
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## New version of CADMAN software suite offers enhanced features for smart manufacturing

LVD has released a new version of its programming and shop management software, CADMAN® Suite version 8.5. The release includes enhancements for every CADMAN module, such as an improved dashboard for more intuitive use, and extends CADMAN's integration capabilities to include the next generation of LVD's Touch-P punch press control, as well as non-LVD cutting and punching equipment.

CADMAN helps streamline the complete fabrication process to make smart manufacturing possible, starting with a 3D part concept communication to production control, organising a shop's manufacturing flow, to cutting, sorting and bending.

Beyond its new, modern look and feel, CADMAN Suite v8.5 provides these key updates:

CADMAN-B bend CAM software has improved bend solution finding, including tool preselection based on active catalogue(s). Preferred custom tooling can be selected followed by several checks ending with a collision check on a 3D virtual production. The intelligent import function for import part by part or in batch has been

enhanced. Form features are recognised, existing bends in the part can be indicated or bends can be excluded from the automatic solution find process.

CADMAN-B is now also available for LVD Synchro-Form Series press brakes. Synchro-Form is the next generation of adaptive bending system designed specifically for bending of XXL profiles.

Touch-B control software, which can be used in combination with CADMAN-B, is also improved. The sequence change, i.e. the time between bending parts, is now optimised, resulting in a significantly higher press brake working speed for increased productivity.

CADMAN-L and CADMAN-P CAD/CAM software modules feature advanced nesting capabilities for laser cutting and punching. New functions such as "minimal heat impact" while finishing parts one by one, material thickness defined parameters, material and material condition technology cutting tables ensure a more smooth and automatic preparation for laser cutting. For punching, smart functionality such as "avoid hits with form tools" and "punch with form

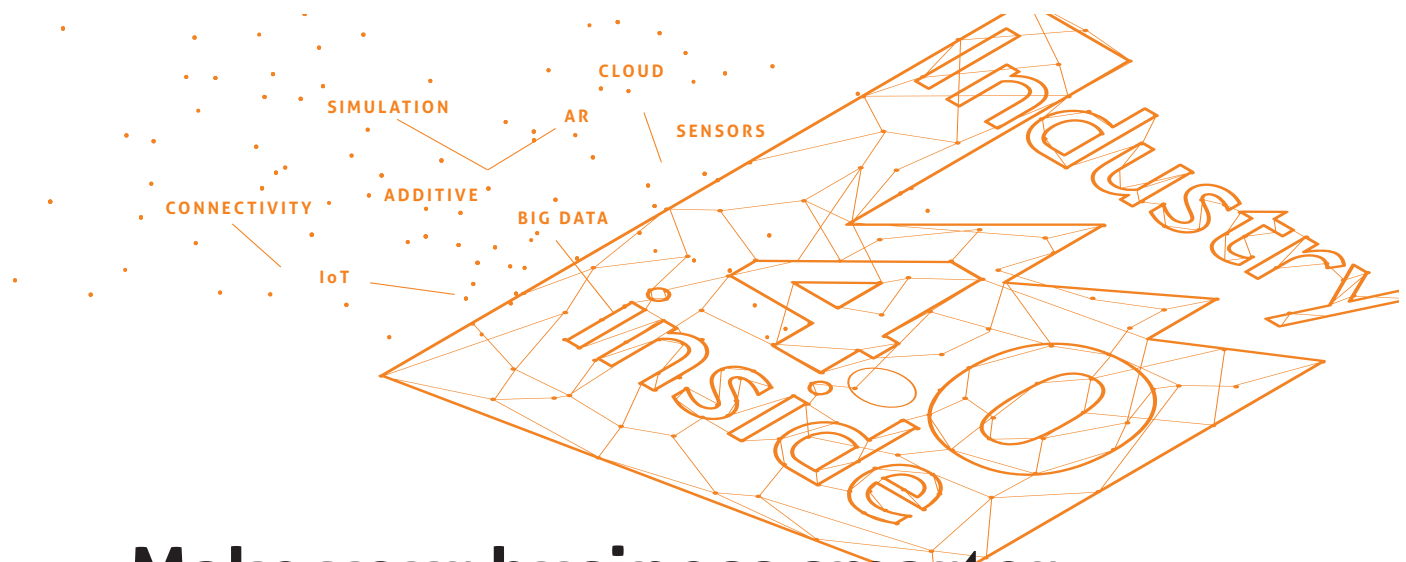


tools last" ensure reliable punching preparation. In the common module, parts can be detected automatically or manually in a multiple part drawing.

CADMAN-JOB now connects to the latest Touch-P control for LVD punch presses as well as integrates to other, non-LVD fabrication cutting equipment. CADMAN-JOB connects the front office intakes and processing of orders with shop floor operations, facilitating a controlled process from the order to the finished part. The software provides real-time insights from the shop floor, so users can optimise machine production time and fabrication resources.

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# Prima Power laser cutter is first of its kind in the UK

Following the recent high-profile unveiling of the company's advanced high-power laser source with fibre technology, Prima Power became the world's first laser cutting machine manufacturer to launch its own, in-house developed fibre laser source.

Now available across the company's product range, Prima Power's fibre laser's active gain medium is an optical fibre doped with ytterbium. Negating the need for laser gases, mirrors or moving parts, laser light is transferred via a passive fibre cable to the cutting head. The eco-compatible, highly-efficient Prima Power technology delivers enhanced levels of productivity and excellent precision with low maintenance requirements.

The first Prima Power machine sold in the UK featuring the company's own high-power laser source, an advanced Rapido 3D laser cutter, was recently installed, along with a 2 m Prima Power brake press, at the premises of PAB Coventry Ltd.

PAB Coventry Ltd is one of Europe's leading providers of advanced fabrication services. In addition to offering expert prototype, production, project management and design facilities, the company also provides specialist tooling. PAB boasts long standing relationships with many UK and international customers who are involved in a variety of challenging industries.

PAB Coventry Ltd has earned an enviable reputation for the quality of its output and for working closely with its clients to enable projects to be taken smoothly from inception to completion has resulted in the company becoming a major supplier of premium quality components. In addition to manufacturing parts such as panels, grilles, trim, instrumentation and brackets to leading prestige and super-car manufacturers, the company also supplies the equally demanding aerospace, defense and rail sector with components, including pressings, brackets and welded assemblies.

Explaining the reasons behind the company's latest Prima Power purchase, PAB Coventry CEO, Mark Brazier enthuses: "PAB Coventry boasts more than 30 years of experience of working with metals such as stainless steel, high strength and mild steels,



aluminium, copper and a range of other complex and exotic materials. Our in-depth knowledge, the workmanship of our skilled staff and our use of state-of-the-art fabrication production aids enables us to deliver a wide range of high-quality engineering solutions.

"Given the demanding nature of the customers that we serve and the high-standards of the fabricated parts they expect us to deliver, some years ago we searched for an advanced laser cutting machine that would enable the production of high-volume, high-quality components. Having compared the available options, we considered a Prima Power machine to be the ideal choice. Once installed, not only did our original Prima Power purchase prove its ability to produce high volumes of premium quality components, we were extremely impressed with its reliability and the excellent service we received from Prima Power UK.

"Over several years, as our business has grown and the need for further fabrication machines, such as laser cutters and press brakes occurred, despite our early positive experience with Prima Power, to ensure that we received the best tool for the job and best value for money we looked at other brands. However, when we made comparisons, each time we concluded that, whatever the machine category, the Prima Power offering was the perfect option for our high volume, high quality needs.

"The recent installation of our advanced new Prima Power Rapido fibre 3D laser cutting machine marks the final piece in our ambitious three year, £3 m expansion program. Due to the growth of our business and our continued loyalty to the brand, I believe that we are now the UK's largest user of Prima Power machines. In addition to the machines' excellent precision and efficiency, as Prima Power's product range covers all aspects of sheet metal working, including laser cutting, welding and drilling, punching and bending, it helps that the company's common software and operating systems provides great flexibility when we are deploying our production personnel."

Offering models to suit all applications, Prima Power's laser cutting machines are based on extremely flexible technology ensuring that a wide variety of materials and thicknesses can be processed, with no limits to the shapes users are able to create. Prima Power fast programming system enables changes to be applied in any phase of production with virtually no costs or time implications. Prima Power's comprehensive laser cutting range delivers the highest standards of precision and quality of cut edge, in addition the machines' cause no distortion to the manufactured parts.

With X Y Z axis strokes of 4,080 mm, 1,530 mm and 765 mm, the advanced Prima Power Rapido 3D laser cutter, as purchased by PAB Coventry, is based on a robust, synthetic granite frame designed with

state-of-the-art topology optimisation methods, ensuring smooth movements, even at the highest dynamics. Excellent user accessibility is provided, due to the machine's overhead retractable arm and cantilever structure arrangement. A focusing head with direct drives and transducers delivers high-dynamics, excellent levels of accuracy with no backlash and reduced maintenance needs.

A wide range of different applications within a single machine are possible as, thanks to the machine's movable partition wall and a sliding roof, the available working area can be divided into two halves. The Rapido's ingenious design delivers a large working volume with reduced machine dimensions, ensuring that less factory space is occupied.

Various machine configurations and a range of accessories are available to meet a variety of production requirements, including a turntable, split cabin and an automatic shuttle, in addition a welding head is also offered.

The use of easy-to-use programming software and Prima Power's simple operator interface ensures fast setups and reduced downtime. Whilst user-friendly and powerful



2D and 3D CAD-CAM software allows the rapid generation and testing of the entire cutting program.

Mark Brazier concludes: "Now installed and fully operational, our new Prima Power Rapido 3D fibre laser cutting machine is now producing impressive volumes of high-quality, precise components. We have been particularly impressed with the machine's ability to generate intricate cutting shapes. Not only is our latest Prima

Power laser cutting machine purchase allowing our production levels to keep pace with current demand, the machines impressive productive potential should ensure that we are able to keep up with future requirements.

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## Handy all-rounders

### Power sources from Fronius for manual welding tasks

For users to achieve optimum results during manual welding, reliable operation is not enough; welding systems also need to be easy to use and highly powerful. A long service life and high quality also play a key role. Fronius offers its customers a comprehensive product portfolio to meet these requirements. The systems are suitable for a wide variety of welding processes and applications across a number of different sectors. For example, they are used in industry, in SMEs and also in the workshops of agricultural enterprises and handymen.

The TransSteel 2200 is the latest development from Fronius for this segment. This compact three-in-one solution combines MMA welding, gas metal arc welding (MIG/MAG) and tungsten inert gas welding (TIG) in one power source. In addition to this, Fronius is also offering a new TIG series, which comprises the MagicWave 230i, MagicWave 190 and TransTig 230i. Thanks to their rapid signal processors, they always achieve the exact current curve that allows for maximum arc stability with the lowest possible noise emissions. With their special housing, the devices are particularly robust and durable.

#### TransSteel 2200: more efficient welding of steel

Welding steel requires an exceptionally robust and reliable tool; one that continues to work perfectly even when exposed to the harsh conditions prevalent in machine and steel construction or the production of pipelines, cranes or rail vehicles. Fronius has recently launched the TransSteel 2200. It is the first single-phase MIG/MAG inverter power source from Fronius that is also multiprocess-capable. This makes it an all-rounder that can give customers the best weld properties for MIG/MAG as well as TIG and MMA welding applications. One big benefit is the variety of characteristics available, including for aluminium and copper silicon alloys. The TransSteel also features a second gas solenoid valve that makes it easy to switch from MIG/MAG to TIG. Users will also benefit from the ease of use: operation of the TransSteel 2200 is quick and intuitive. Perfect weld seams can be created in just three steps. The power



The TransSteel 2200 is the first single-phase MIG/MAG inverter power source from Fronius that is also multiprocess-capable. It is primarily suited to steel construction for use in workshops, as well as for assembly, repair and maintenance work

source also offers a feature that, based on the selected mains fuse protection, sustains the welding operation for as long as possible by automatically steplessly adjusting the welding current, without changing the welding result. The automated Power Factor Correction (PFC) extends the current consumption over time and ensures that the available power is efficiently used. The devices thus have a large action radius, as the PFC technology allows long mains leads to be used, enabling welders to employ them with greater flexibility.

#### Smart devices for manual TIG welding

To further improve tungsten inert gas welding, or TIG welding for short, Fronius is constantly honing and refining its equipment and processes. During TIG welding, an arc burns between a non-melting tungsten electrode and the metallic workpiece in an oxygen-free, reactionless gas atmosphere. The welder can introduce filler materials to the arc as necessary in the form of rods or wires, which then melt and guarantee the required filling of the weld seam. Due to the inert protective gas shield, there are no chemical reactions with the liquid weld pool. This allows ultra-pure weld seams with exceptional mechanical and technological properties to be produced. TIG welding is thus the first choice when there are specific

weld-seam requirements as well as in industries in which the weld seams must be leak-proof, such as the food industry or in container construction. The welding process is also characterised by a concentrated and stable arc, a smooth, even and slag-free weld seam and spatter-free welding behaviour in almost all positions – all essential prerequisites for maximum seam quality. With the MagicWave 230i, MagicWave 190 and TransTig 230i power sources, Fronius is now offering a new TIG series that provides users with the necessary technology for almost any welding task. The focus here is on networking and digitisation functions, an even wider scope of application, greater ease of use and higher deposition rates.

#### Greater connectivity: the MagicWave 230i

Connectivity is gaining greater significance in increasingly networked production halls, including for welding technology. This is why Fronius has developed the new MagicWave 230i TIG power source. Together with the TransTig 230i DC power source, it is the first power source from Fronius that communicates with other devices via Bluetooth, WLAN and NFC technology, and can be networked with them. Thanks to the USB ports, software updates can be installed and welding data documented with ease. Progress has also

been made in terms of hardware. The intelligent high-frequency (HF) ignition ensures perfect ignition properties, while the innovative PFC technology ensures that the devices are extremely energy efficient. An improved, compact cooling unit serves to further extend their service life. The MagicWave 230i is available as a multivoltage version. Using the Fronius Power Plug, a waterproof, lockable plug connector on the rear of the power source, the mains cable or plug can be changed quickly and easily depending on where the device is being used. This means it can be used anywhere in the world, even with different mains voltages.

The MagicWave 230i is also generator-compatible and offers surge protection up to 400 volts, meaning it is portable and can even be used efficiently with unstable grids. The robust housing extends its service life and offers effective protection against damage. The MagicWave 230i's operating concept has not escaped the attention of the Fronius engineers. Thanks to its multilingual concept, the power source is very intuitive to use. The user can also easily retrieve and set their most important welding parameters with the aid of a favourites button. Another bonus is the redesigned welding torch. An ergonomic grip combined with a torch head changing system as standard increases comfort and convenience, and allows for even more precise handling. A ball joint decouples the welding torch from the highly flexible hose pack and prevents twisting. The integrated, high-performance LED illuminates the seam



The MagicWave 230i can communicate with other devices via Bluetooth, WLAN and NFC technology, and can be networked with them

area efficiently, leaving the welder to concentrate entirely on their primary task: the perfect weld seam.

### MagicWave 190 and TransTig 230i: small all-rounders that make a huge impact

The MagicWave 190 is also suitable for welding materials such as stainless steel or aluminium. The power source has 190 amperes and boasts an excellent price-performance ratio. One of the key advantages is that users can extend the 190, as well as the 230i, as desired with various function packages. These include the job function, the PulsPro package to obtain all pulse functionalities, additional data documentation and limit monitoring. The latter aids the user in setting a defined parameter window and keeping to certain

welding parameters. The TransTig 230i also forms an integral part of the new series. This pure DC power source can optionally be



The TransTig 230i is also part of the new TIG series. This pure DC power source can optionally be supplied with a water-cooling system and is suitable for all welding applications apart from aluminium



The MagicWave 190 is ideal for welding materials such as steel, stainless steel or aluminium

supplied with a water-cooling system and is suitable for all welding applications apart from aluminium. It has 230 amperes. Just like the MagicWave 230i, the TransTig 230i ticks all the boxes in terms of connectivity. It can communicate with other devices via Bluetooth, WLAN and NFC technology, and can be networked with them. Every device is also available as a multivoltage version, meaning they can be used anywhere in the world, even with different mains voltages.

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## Teaching TFL the art of welding

The construction of the London Underground is often considered an engineering marvel, but we often forget the little miracles that happen on a day to day basis. A case in point is the experience of a group of Transport For London (TFL) maintenance engineers who journeyed in the summer to Hertfordshire's ultra-modern Learn to Weld Technical Training Centre (TTC) with no welding knowledge whatsoever and returned to London as qualified welders. This was all completed within one week.

The brand behind this feat is Learn to Weld, the education division of leading UK welding products company Weldability Sif. Entirely dedicated to training Britain's next generation of welders, Learn to Weld's seasoned expertise came in handy, when TFL set about solving a reliance on contractor work for train carriage maintenance, at their Stratford depot.

With no welding experience under their belt, it was down to Learn to Weld's mixture of seasoned tutors and cutting-edge VR technology to fill in the knowledge gap for the TFL engineers. The Learn to Weld TTC itself, where the group studied, certainly helped matters, equipped with its state-of-the-art welding bays, industry-standard equipment and a complete 'Virtual Learning Suite.' This virtual welder training suite is Learn to Weld's key asset, fitted out as it is with cutting-edge fully-immersive virtual welding equipment which allowed the engineers to train digitally and safely, before trying their hand at real welding, in one of the centre's many welding bays.

After a week at the Letchworth-based TTC, the engineers left fully trained to the equivalent of the high BS EN standard



required. Returning to London in August, they were able to weld on the Jubilee line trains in their care, maintaining aspects such as the aluminium-base within each carriage.

Weldability-Sif Chairman, Adrian Hawkins, says about the project: "We are pleased to see the investment in VR and E-Learning developments we have made, to complement our welder training courses, which has led to the fast tracking of students through the Level 1 courses we provide. With the package we offer, it is possible to introduce learners to the various welding processes within a week, process by process, bringing them to an acceptable level of knowledge, to enable them to practice further and hone their welding skills. Our industry has a severe shortage of welders and fast-tracking students will become more relevant as the nation develops its Industrial Strategy."

### Are you ready for EDI? Extractability announces the launch of the ProtectoScan EDI

Exposure to environmental hazards has always been difficult to monitor in the workplace, but the ProtectoScan EDI is about to change all that.

The latest environmental control solution from Hertfordshire-based Extractability, the ProtectoScan EDI is an Environment Detection Instrument (EDI) that provides intelligent, data-driven protection in the industrial workplace. An indoor air monitoring instrument that measures and records real-time data for dust particulate, noise, temperature and humidity, EDI catches the eye with an LED traffic light display, alerting users to any notable issues, giving users

instant feedback and a visual representation of what is going on in their workshop.

Users will also benefit from EDI email alerts when exposure limits are surpassed. All live data sits at the users' fingertips via WiFi on the dedicated WebApp, turning the EDI into the perfect cloud-based solution, monitoring and recording exposure levels for every second of the day, 365 days a year.

The continuous monitoring of the environment in the workplace can contribute significantly to protecting the health of employees by enabling employers to take appropriate measures and set up automatic integration of fans or similar devices, which, with optional additional accessories, EDI can control. Just as essential for the employer's duty of care is the Extractability service of a full report and calibration certificate for formal risk assessment. Extractability will process the data gathered and provide an optimised table and graph, along with a report following an annual service.

With the recent Industry 4.0 trend seeing a greater integration of automation and data exchange in the manufacturing sector, the ProtectoScan EDI is Extractability's boldest step yet to help employers remove hazards from the workplace, stay within the regulations, and improve industry and health among the workforce, creating a safe and clean workplace environment for everyone.

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## New dimensions in laser welding

Equipped with optimised ENSIS beam technology, the new AMADA FLW ENSIS laser welding cell bridges even large gap sizes. Welding nearly without any deposits and at an exceptional speed, it is entering a new era in laser welding.

The latest development in AMADA's FLW series, the new FLW ENSIS laser welding cell, processes far larger gap sizes than generally possible by using laser welding technology. The system is based on the proven 3-kW fibre laser with variable beam control and innovative weaving technology, whose integrated rotating optics allow the laser beam to move from side to side. In the FLW ENSIS, this AMADA system has once again been optimised. With the so-called "Ring Mode Beam", the welding beam fans out in a ring shape, which allows to optimally bridge even large gap sizes – all this in combination with the weaving technology and the push pull filler wire guide.

Another highlight of the new FLW ENSIS laser welding cell lies in the fact that no deposits, deformations or discolorations are visible on the lower surfaces of even thin

sheet metal. This outstanding quality feature results from the precisely defined energy penetration of the fibre laser, whose strength and range in the welding process can be accurately adjusted and always precisely adapted to the material of the component that is to be processed.

The FLW ENSIS excels through its exceptional welding speed which is generally significantly faster than at conventional laser welding systems. The FLW ENSIS welds different materials together in just half the time taken by conventional approaches. An example in this context is manufacturing housings where it's necessary to weld the outer edges and apply metal plates to reinforce the back of the component.

When it comes to overlap welding operations, the FLW ENSIS is again noticeably faster than conventional techniques and only takes a fraction of the time required to complete the entire welding process. The welds that are applied during this process are at least as durable and resilient as joins produced using spot



welding. However, the FLW ENSIS also excels in the field of butt-welding or flux-cored welding, during which it is even possible to switch between welding with and without filler wire without interrupting operation. Last but not least, the M5 version of the machine comes with a shuttle table system, that greatly reduces cycle and stoppage times.

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## Sertec invests in new £500,000 robot welding cell

Tier One automotive supplier Sertec has invested in a new £500,000 robot welding cell to manufacture parts for the new Toyota Auris. The West Midlands-based company won the contract to manufacture the rear seat assembly for the new Auris from Toyota supplier Adient.

The new manufacturing cell, designed and supplied by Cyber-Weld Ltd, FANUC's strategic arc welding systems supplier in the UK, is scheduled to produce circa 80,000 rear seat assemblies every year at Sertec's Coleshill facility. Sertec will manufacture two variants of the Auris rear seat, which will be manufactured at Toyota's Burnaston plant in Derbyshire, with different assemblies for the hybrid and all-electric variants.

The new MiG welding cell, which was designed by Cyber-Weld, the Southam-based robot welding specialist, is equipped with two Fanuc ARC Mate 0iB robots, controlled by R-30iB controllers. In addition, the cell is equipped with a 500 kg payload turntable capable of 180° indexing, air-cooled Binzel welding torches and a torch cleaning station. Safety is provided by

metal guarding and the FANUC dual check safety (DCS) software package.

Many of the welds on the Auris seat structures are deemed safety critical and the cell has therefore been equipped with the ARCAgent™ weld monitoring system, including industrial PC and cabinets, to monitor and record every weld.

Sertec is one of the world's leading structural body parts suppliers, specialising in aluminium welding techniques alongside more traditional resistance and MiG welding. The move into aluminium welding has helped support the company's long-term relationship with Jaguar Land Rover, which now includes a manufacturing facility in Hungary to support the carmaker. Sertec structural body parts have been used in a number of JLR's flagship vehicles including the Range Rover, Range Rover Sport, Discovery and Discovery Sport.

Colin Partridge, head of welding projects at Sertec Group, comments: "The contract to make the rear seats' cushion assembly for the Auris is our first venture with Adient / Toyota and a very important one for the



company. We needed a completely new robot manufacturing cell, which would have the flexibility to weld the different seat structures required by Toyota. Cyber-Weld reacted quickly and suggested a design that both impressed Toyota and Adient, and also delivered on the key production KPIs that we stipulated. The cell was delivered and commissioned on schedule, which has allowed us to fulfil our commitments to the customer."

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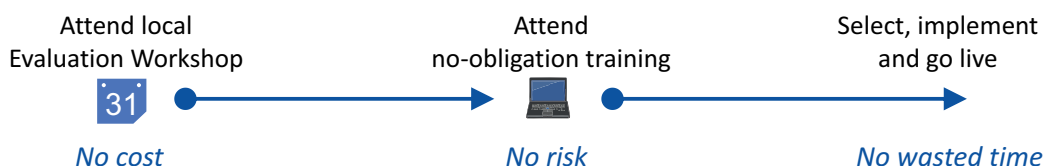
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