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# Magnetic workholding for 5-axis machining

The Tecnomagnete range of Italian-made, permanent-electromagnetic workholding systems introduced to the UK last year by sole agent, 1st Machine Tool Accessories, includes the compact MillTEC Grip magnetic clamping system for 5-axis and 5-sided metalcutting applications.

Such machining strategies reduce the number of setups, often to one, shortening floor-to-floor times. Superior access to the component also allows the use of shorter tools, enabling increased feed rates, heavier cuts and hence higher productivity.

Low-profile, frameless MillTEC Grip clamps have a double magnetic circuit that allows uniform clamping between the workpiece and the magnetic surface and at the same time between the magnetic system and the machine table.

A patented feature is the sealed construction with a monolithic, uniform, all-metal top section into which an array of magnets is embedded for holding down workpieces. There are no inserts, sealing resin or any filling compound, so the electric circuitry and magnets inside are protected from contaminants, leading to long, trouble-free life.

MillTEC eliminates bending and deformation that can be caused by mechanical clamping, ensuring stability and structural uniformity of the whole assembly. It leaves five sides of a component freely accessible for milling and drilling and the light weight of the clamping system means that heavier components can be processed for a given maximum table load.

The electrical supply is connected for only a few seconds to activate and then deactivate clamping of the workpiece, which during machining is gripped by the power of the high-energy permanent magnets. The system avoids the drawback of conventional mechanical workholding, whereby machining is restricted by the need for clamps to secure the workpiece. For the same reason, the cost of such clamps, other consumables and fixtures is eliminated.

Parts can be clamped onto the magnetic plate in a matter of seconds, speeding setups. Some other conventional clamping systems need components to be pre-machined and naturally this time is saved as well with Tecnomagnete products.

A further advantage is the thinness of the MillTEC Grip magnetic plate, either 42 mm or 51 mm, which maximises Z-axis travel on a vertical machining centre or Y-axis travel on a horizontal-spindle machine, allowing taller components to be manufactured.

**1st Machine Tool Accessories Ltd**
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# The event that always delivers

## John Barber reports from Pfronten, Germany

**The DMG MORI Open House, held from January 26th-29th, promised to show 90 high-tech machines at the annual event. With over 8,000 visitors in attendance from around the world and a diverse range of the latest advanced technology, innovation and solutions on show, the event certainly delivered a world of machining to guests.**


### New technology

Once again one of the highlights for visitors was the launch of brand new technology. The world premieres showcased the company's innovative capabilities and the six new high-tech machines all impressed the large number of guests in attendance. The CTX gamma 3000 TC 2nd generation in the turn-mill sector was presented, while the DMU 160 P duoBLOCK® and DMU 210 P expanded the DMG MORI portfolio in universal milling. The DMU 600 Gantry linear was also on show as the new exponent in XXL large part machining and the DIXI 125 in the field of high-precision milling. The ULTRASONIC 20 linear rounded off this year's programme of world premieres.

DMG MORI also presented its diversified product portfolio with best selling products as well as state-of-the-art manufacturing and automation solutions. In addition, demonstrations showed how customers can network their company organisation completely with the machine via CELOS® and realise complex machining simply with the DMG MORI technology cycles. The machine tool manufacturer responds to digitalisation and supports users on their path to an intelligent production in the direction of Industry 4.0.

The impressive headquarters in Pfronten is home to over 1,300 employees working across the vast site. Visitors took the opportunity to enjoy a guided factory tour which proved to be both engaging and highly popular. Attendees were also encouraged to view live demonstrations of the latest technology and to attend a variety of seminars.

Key members of the press worldwide were invited to attend a briefing by DMG MORI president Dr Masahiko Mori and chairman of the executive board Dr Rüdiger Kaptiza. The presentation, as always, was very informative and highlighted key areas of focus for the company in 2016. Dr Rüdiger Kapitza opened the presentation with a number of key announcements focusing on the growth the company has experienced and the predicted trends for the year ahead. The UK market is expected to grow by 7.8 percent in 2016 with overall worldwide growth estimated to be 4.1 percent in the year ahead. Korea was identified as a developing market with a new technology centre due to be opened in the second quarter of this year. A further technology centre, this time based in Russia, will be opening on the 23rd May.


In total DMG MORI will be launching 13 brand new machines into the market in 2016. Dr Rüdiger Kapitza said: ''This is all about improving our machines in their performance'' Another key area for the company is its relationship with Porsche as the exclusive components supplier to the Porsche F1 team. 60 different component parts are produced exclusively and so far more than 2,300 pieces are produced. Dr Rüdiger Kapitza continued: ''When we won the championship two years ago our competitors really pricked their ears up and you can only do this with the best possible parts''

### Additive manufacturing

In the field of additive manufacturing DMG MORI stands out from other suppliers in that the machine tool manufacturer uses powder deposition welding with laser, as it has long been used in principle for repair work in the tool making or engine technology branches. In this process the powder is melted onto the base material by the laser beam. Unlike other laser-based processes in additive manufacture that work according to the layer principle, whereby a component is built-up layer by layer from powder material.

2016 will see DMG MORI expand its additive manufacturing programme to include the LASERTEC 4300 3D. An understandably upbeat Dr Masahiko Mori said: ''We are the most advanced additive manufacturing solutions provider in the world. 3D coatings is very, very exciting. Day by day we are going to increase the capabilities of these machines'' This second hybrid machine will add the possibility of

turning operations to laser deposition welding and 5-axis milling, so that rotation-symmetric components can now also be produced with the hybrid process. Equipped with a mirrored C-axis, workpieces can also be machined on the rear side with the counter-spindle thus enabling in total 6-sided complete machining of the finished part. Not even longer workpieces present a problem, because in this case the lower tool turret supports the component during machining.

**Aerospace**

The aviation sector will be a growth market for decades to come. For this growth to happen, manufacturers and their suppliers all along the value-creation chain need reliable, highly innovative partners. For years DMG MORI has supported customers in the aviation sector with the Aerospace Excellence Centre in Pfronten.

DMG MORI provides the latest technology and the capability to innovatively support and even help steer customers own developments. Turnkey solutions can be developed in close collaboration with the customer, even for complex workpieces and hard-to-machine

materials. As a technology leader in the field of 5-axis technology, DMG MORI has a unique product range of high-tech machine tools with industry- specific options and engineering services for parts manufacturing in the aerospace and aviation sectors.

Concerning the Aerospace Excellence Centre, Dr Masahiko Mori said: ''We can save more than 70-80 percent of cutting cycle times. This is a huge opportunity for us not just in Europe but in the USA and Japan.''

**The future**

The topic of "Industry 4.0" is dominating the discussion of the future like no other, even in the sector of machine tool construction. As a leading manufacturer of metal removing machine tools worldwide, DMG MORI supports its customers on their way to digital transformation with the app-based CELOS system and other intelligent software solutions. CELOS was once again a hugely successful aspect of the Open House with software demonstrations and displays remaining ever popular.

A huge part of the success of any company comes in the form of costs savings; something which DMG MORI is more than aware of. Dr Mashiko Mori concluded: ''We have 300 different machines and we are coming down to 220 in the future. We are hoping to get to 120-130 machines. This will hopefully reduce costs in the near future.

**DMG MORI UK**
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**Email: steve.finn@dmgmori.com**
**www.dmgmori.com**

# Extended opening hours help maximise your time at MACH

The MTA, organisers of MACH 2016, has announced that the show will now open at 9.00 am in order for visitors to allow extra time to take in the wealth of advanced technology on show as well as take in one of the seminars at the event.

**More to MACH 2016 than just the tech on show**

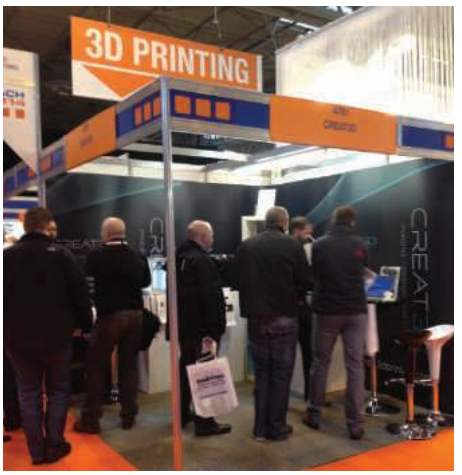
As well as all the technology on show at MACH 2016, there is a vibrant seminar programme for visitors to enjoy. This includes leading speakers from academia and industry, marrying together the theoretical and practical aspects of 21st century manufacturing. The full seminar programme was due to be launched in February.

The seminars will be delivered in two dedicated theatres and will feature compelling talks by some of the industry's best known OEM's and institutions including; Airbus, Messier-Dowty, McLaren, Cranfield University and the MTC.

On Wednesday 13 April, the seminar programme will take an in-depth look at Additive Manufacturing with a particular focus on the 3D printing revolution and on Thursday 14 April it will be turning its attention to Industry 4.0. As well as fascinating discussions around the topics there will be plenty of opportunities to network, with evening sessions being hosted by Airbus, Messier-Dowty and Siemens Power Generation to name but a few.


Lloyds Bank SME Commercial Banking will once again be the headline sponsor. David Atkinson, head of Manufacturing, says: "Supporting manufacturing businesses is a pivotal part of our commitment to driving the UK economy, so we are really pleased to be headline sponsors of MACH 2016. The expansion of the show demonstrates confidence in the sector to invest in new technology to improve productivity, regardless of the headwinds in the worldwide economy that the sector faces into."

**3D Printing and Additive Manufacturing Zone launches at MACH 2016**




The wide spread adoption of 3D printing and additive manufacturing has been one of the biggest revolutions in modern manufacturing technologies in the past decade, streamlining how prototypes are made and small batch manufacturing is carried out.

With this in mind, MACH 2016 has announced that this year's exhibition will feature a dedicated 3D Printing and Additive Manufacturing Zone, showcasing all the latest advances in this technology.

James Selka, CEO of the MTA, says: "3D printing and additive manufacturing are becoming increasingly prominent within the industry. We recognise that this is no longer a fledgling technology but an integral part of the manufacturing process. The MACH Exhibition is the home of technological advances for the manufacturing industry in the UK and it is only right that we explore this process further through its own dedicated zone."

The 3D Printing and Additive Manufacturing Zone will be one of the biggest at MACH 2016. Many of the leading companies in the sector such as, Creat3d, Laser Lines, Nabertherm, Photo Labs and Stratasys are already on the floorplan, and more are in the pipeline to exhibit.

Simon Brandon, UK marketing manager at Stratasys, emphasises the rapid growth of additive manufacturing: "3D printing has long been a tool for product design and development, but we now see its use right across manufacturing - including tooling and production parts. Stratasys wants the opportunity to demonstrate the quality, safety and cost benefits brought by 3D printing applications to the UK manufacturing community, so exhibiting at MACH is the natural choice for us. We feel that coming to MACH is a key part of our future success."

**Visitor information**

MACH 2016 runs from 11th to 15th April 2016 at the NEC Birmingham under the banner "Manufacturing in Motion." Opening hours are now 9.00 to 17.00 Monday to Thursday and 9.00 to 16.00 on Friday. Entry is free of charge and, once inside the two exhibition halls dominated by MACH, you'll find the UK's latest and best metal forming, metalworking and manufacturing technologies.

This year there is a hugely extended UK Manufacturing Zone and the MTA is delighted to welcome back large OEMs including Airbus and Messier-Dowty, among others. Here you can experience a broad cross section of UK capability in component manufacture in one area.

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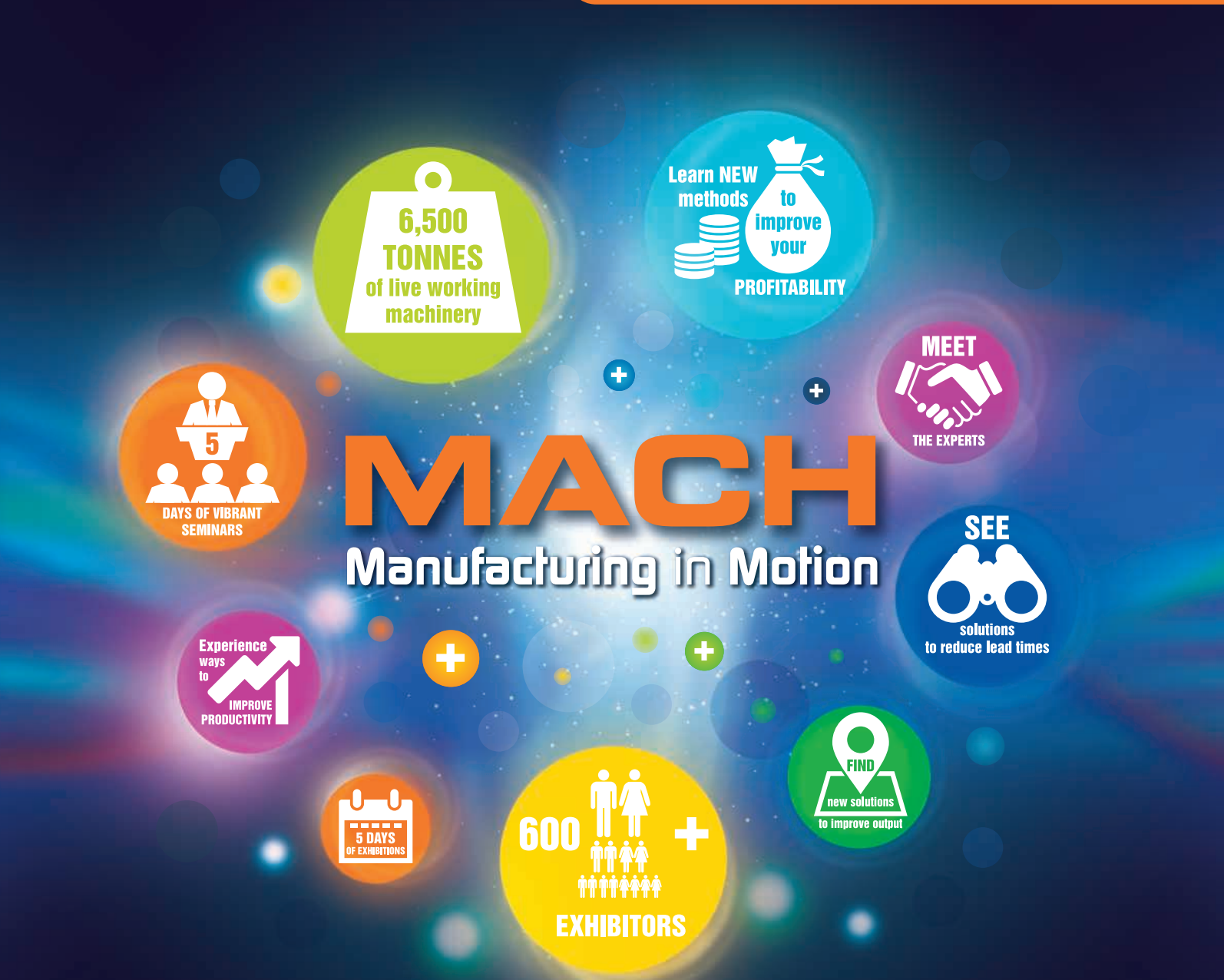


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# Everything you need, everything you want, all on one stand

Mills CNC, the exclusive distributor of Doosan machine tools in the UK, will showcase 19 high-performance Doosan lathes, machining centres and mill-turn machines, including seven new models, on its stand at MACH.

The company's stand at MACH 2016 is the one of largest Mills has ever booked at the show and is also one of the biggest stands at this year's event.

Mills will be showcasing an impressive cross-section of its Doosan lathes and turning centres, 3- and 5-axis vertical machining centres, horizontal machining centres and mill-turn, multi-tasking machines on its stand, many of which are new machines making their UK and/or MACH debuts.

Kevin Gilbert, Mills CNC's managing director says: "Doosan machine tools set new benchmarks for performance, productivity, reliability and best value. The machines we're taking to MACH highlight all of these attributes."

**NEW Lynx 2100B and Lynx 220LYSC**
Mills is showcasing two Lynx lathes on its stand at MACH: the soon-to-be-launched Lynx 2100B, an 8"chuck/65mm bar capacity model equipped with a 15 kW/4500 rpm spindle and the recently-launched Lynx 220LYSC, a long-bed lathe (510 mm turning length) equipped with a 16-station turret, +/-52.5mm Y-axis, 15 kW/5000 rpm main spindle, 5.5 kW/6,000 rpm sub-spindle and driven tools (3.7 kW/6000 rpm).

**NEW Puma GT2100M integrated with a Fanuc robot**
The Puma GT2100M is a universal box guideway turning centre with an 8" chuck / 65 mm bar capacity and driven tools (5.5 kW/5000 rpm). The machine is equipped with a 12 station servo-driven turret and is being exhibited with an integrated Fanuc Robot to demonstrate its productivity potential achieved via plug and play automation.

**NEW Puma GT2600**
The new GT2600 box guideway turning centre has a 10" chuck / 76 mm bar capacity, 658 mm turning length and, like all models in the range, is equipped with a programmable tailstock and an automatic tool setter. The machine is competitively-priced and built for productivity with a 22 kW/3500 rpm spindle and a 12 station turret.

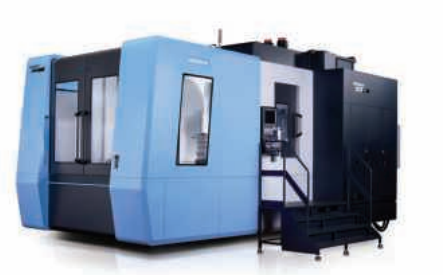
**NEW Puma 4100M large powerful lathe with driven tools**
This is a high-performance lathe for manufacturers looking for a large 15" chuck capacity machine with driven tools (7.5 kW/ 4000 rpm)

The Puma 4100M has a box guideway construction and boasts a number of innovative features that include a thread pickup function and an arbitrary thread repair function which allows the operator full control of the machine's feed rates during threading cycles.

**NEW Puma 5100LYB**
The Puma 5100LYB is a 2-axis, next generation 21" chuck (165.5 mm bar capacity) heavy-duty turning centre equipped with a C – and Y- axis (+/-75 mm) and driven tools. The machine has a 12 station servo-driven turret with BMT75 tool holder interface and a directly-coupled 23 Kw/4000 rpm driven tool motor.

**NEW DNM 5700 II (Fanuc control)**
The DNM5700 II is the latest generation of Doosan DNM vertical machining centres and features a large Y-axis stroke (570 mm), and the advanced Fanuc 0iF control which delivers fast processing speeds and has a user-friendly graphic display.

**NEW DHF 8000 machine with nodding head design**
The DHF 8000 is a large 5-axis simultaneous twin pallet horizontal machining centre specifically designed for use in the aerospace industry and, as such, is second to none for cutting tough and difficult-to-machine materials such as those used engine housings etc. The machine features a nodding head design enabling it to cut in both vertical and horizontal planes thereby increasing productivity and flexibility. The machine has twin pallets (each pallet is 800 mm x 800 mm) and a 25 kW spindle with 2-speed gearbox and HSK100 spindle taper.



**NEW SMX 2600S flexible multi-tasking machine**
SMX machines represent the third generation of Doosan Multi-tasking mill-turn centres (the 'S' stands for 'Super').

The SMX 2600S is equipped with a 10" chuck and has 81 mm bar capacity on both left and right hand spindles. The machine's Y-axis stroke (300 mm) is delivered via orthogonal movement on high-precision class roller-type guideways. Accuracy is maintained by six thermal sensors positioned across the machine with the machine's spindles and X-axis ball screw nut cooled by oil. Standard equipment includes Capto C6 built-in spindle and a 40 tool front-loading ATC.

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STAND 5410 HALL 5

MACH 2016 11-15 April

# 600 UK accesses all areas of MACH 2016

600 UK's presence at MACH 2016 extends to three individual stands, comprising Colchester and Harrison manual and CNC lathes on Stand 5658 in Hall 5, Pratt Burnerd International workholding and chucking systems on Stand 4501 in Hall 4 and 600 UK's benchmark education lathes on Stand 4776 in the Hall 4 Learning and Development Zone, where they are exhibited together with the highly successful, US based, Clausing range of metal cutting machine tools which are being exhibited for the first time in Europe.

Hall 5 sees three new Colchester and Harrison lathes, including the new ultra-heavyweight Colchester Magnum centre lathe, available with 660 and 800 mm swing over bed options, centre distances up to 4000 mm and with spindle bore options up to 230 mm. Colchester Magnum lathes have been designed to ensure that they are totally at ease with any heavy metal turning requirement and are capable of fast, heavy metal removal, allied to fine precision finishing.

600 UK will also showcase the newly redesigned Colchester Triumph centre lathe which now gives industrial operators increased productivity benefits with enhanced design features including flexible guarding and moveable, integral DRO with CSS offered as standard.

Another new product on show will be the Harrison Alpha XC combination CNC lathe, which incorporates driven tooling and full C-axis interpolation to their high specification, simple to use, flat-bed CNC Alpha lathe range. This enables operators to carry out secondary operations on one-off and small batch components including milling, drilling and tapping at the machine.

Pratt Burnerd International customers will see a full range of manual and power chucking solutions, demonstrating, amongst others, large special manual chucks and the increasingly successful Gripfast combination power chuck. The Gripfast can be easily retrofitted to existing production CNC machines of whatever manufacture, ensuring operator downtime between jobs is minimised and productivity maximised.



A new addition from Pratt Burnerd is the new Gripsafe chuck force measurement gripmeter, which offers the most reliable way to accurately measure and permanently record gripping forces being applied by a chuck under both static and dynamic conditions, which for all CNC turning jobshops, is a critical health and safety concern.

Following their hugely successful education presence at MACH 2014, 600 UK will display lathes from Colchester and Harrison that are ideally suited for the education and training sectors. The world's best-selling training centre lathe, the Colchester Student, will be exhibited alongside the brand new Harrison EziTurn electronic lathe. The EziTurn has been developed to bridge the huge step up in skill levels required between manual and CNC turning, when preparing engineering apprentices for working in industrial workshop environments.

To complete the impressive range of new products from 600 UK, the highly successful US-based Clausing Precision Machine Tools brand will make its European debut. Clausing will be exhibiting workshop equipment from its extensive catalogue of milling, drilling, sawing, grinding and large swing turning machines.

New to Europe, this range of machine tools has already enjoyed huge success in North America where they are the market leader, the Middle East and Australasia. The addition of the Clausing brand of non-turning machines reinforces 600 UK's 'one stop shop' philosophy.

The addition of the extensive Clausing range of industrial class metal cutting machines allows 600 UK to satisfy the ever increasing turnkey requirements demanded by colleges, UTC's, universities and industry for the highest quality machine tools.

Howard Bamforth, 600 UK sales director, says: "Our plans are shaping up nicely for MACH 2016, with a mix of great new products from all our brands, alongside some well-known, established favourites. We truly believe that as designers and manufacturers of some of the best industrial and educational engineering products in the world, our MACH line-up ranks as one of the most innovative and exciting we've ever produced".

The 600 Group plc is a diversified engineering group with three principal areas of activity: Machine Tools, Precision Engineered Components and Laser Marking.

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Discover our new large-capacity DHF 8000 horizontal 5-axis machining centre – and see it take the most demanding of jobs in its stride.

Find out more about our latest Award-winning and stylish 'SUPER' SMX multi-tasking mill-turn machines – they perform even better than they look!

And get to grips with our latest 6-axis, high-productivity plug and play robot – and realise the potential from automating your manufacturing processes.

With 19 Doosan machines being exhibited there's definitely something for everyone on our stand.

**Mills CNC at MACH: Be excited...be amazed but, more importantly, be there.**

# SCHUNK to debut new lines

At MACH 2016, SCHUNK will be more than doubling the size of its 2014 stand to accommodate the raft of new products that will be shown alongside established market favourites. At this year's show, the innovator in workholding, toolholding and automation technology will be inviting manufacturing industry to review a host of new products receiving their UK exhibition premiere at MACH, whilst industry experts will be discussing SCHUNK's technology in meeting the criteria of Industry 4.0.

As well as the new products that received their world premiere at the recent EMO exhibition, the company will be drawing customers attention to the latest interfaces available for the SCHUNK TRIBOS system. Developed to improve surface finishes and tool service lives, the innovative TRIBOS system and its new interfaces will deliver a higher level of standardisation for precision tool holding. Some of these micro machining interfaces are now available with the TRIBOS RM and TRIBOS MINI ranges.

The TRIBOS-Mini that has been designed for high-speed micro applications can now be integrated with a high-speed HSK-E 20 spindle interface. The clamping technology experts at SCHUNK believe this newly standardised interface is superior to many short taper interfaces due to its accuracy at high speeds. In addition, it needs much less space compared to the HSK-E 25 interface. SCHUNK has designed the robust TRIBOS-RM with an extended L1 dimension of 78 mm especially for high-efficiency 5-axis machining.

In order to allow precision machining of hard-to-reach areas, the mount can also be combined with the standardised TRIBOS-SVL tool extension with adaptations for HSK-A 32, HSK-A 40, HSK-E 32 and HSK-E 40 interfaces. In addition, SCHUNK has expanded its range in such a way that many of the previous special solutions will now be included in the standard catalogue. For example, TRIBOS-Mini will be standardised with ø 1, 1.5, 2, 3, 4, 6 mm and the 1/8 " TRIBOS-RM with ø 3, 4, 6, 8, 10, 12 mm and 1/8." In addition to the HSK-A 25, -A 32, -A 40, -E 25, -E 32, -E 40 interfaces that are already available, both mounts will also be available for HSK-E 20, HSK-F 32 as well as for BT 30 and SK 30. These units from SCHUNK are part of the world's most comprehensive programs for high-precision tool clamping and can now be manually actuated via the SVP Mini and SVP-RM devices.

Additionally, SCHUNK will be keen to emphasise the benefits of its TENDO E Compact hydraulic expansion toolholder at MACH. Capable of reducing setup times by up to 60 percent whilst generating 2000Nm of torque, the TENDO E Compact delivers micron precision for a host of machining applications. With this precision toolholder, even demanding applications with tight tolerances on the form, position and surface finish can be rapidly and reliably machined.


Another product that will be of interest will be the innovative SPM Plus 138 fixture membrane. Manufactured from aluminum, the SPM Plus provides the clamping of a multitude of geometries from all sides with its innovative pull-down effect. Firstly, a 0.5 mm high tuning ring is inserted between the quick-change pallet module and the fixture membrane, and then the exact workpiece geometry is milled according to the blank on the fixture's clamping surface. Once prepared and the tuning ring removed, the workpieces can be inserted within seconds and the complete circumference be clamped by locking the VERO-S module. This in turn deforms the fixture membrane to provide the clamping.

Since the whole process is carried out within the elastic range of aluminium, the clamping operation can be repeated several thousand times. In contrast to conventional clamping blocks, the clamping force of this clamping method is carried out at the circumference of the whole workpiece contour and not just along an axis. Due to the clamping depth of only a few millimetres, the workpiece is fully accessible from five sides. The fixture membrane can be located on the quick-change pallet module with a repeat accuracy of less than 0.01 mm.

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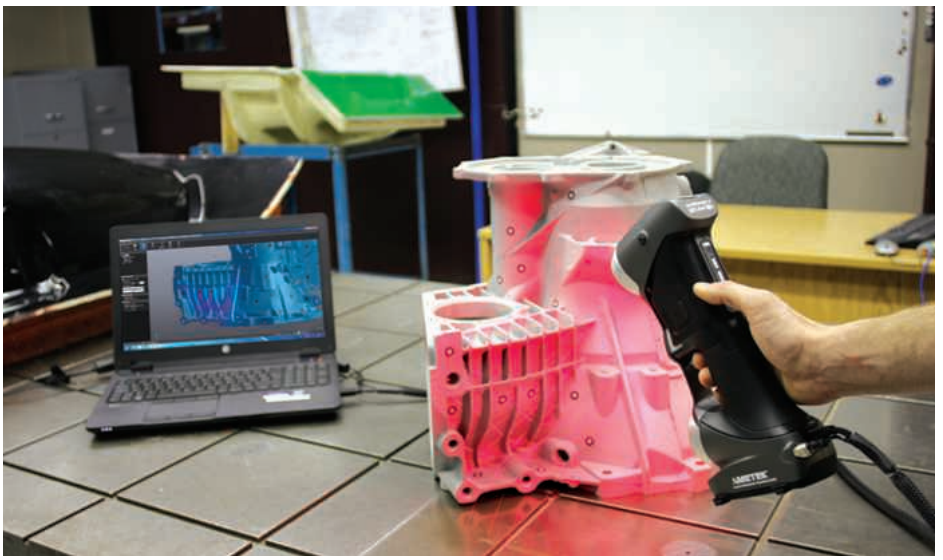
# Hand-held help for measuring parts at MACH



For the ultimate in Portable 3D scanning, Measurement Solutions will be showing the latest in its impressive line-up of HandySCAN 3D hand-held measuring systems on its stand at MACH 2016. Renowned for its extensive line of metrology products and services, the engineers from Measurement Solutions will be on-hand at the show to present innovative product lines and deliver expert advice and guidance for anything 'metrology.'

The latest generation HandySCAN 3D handheld scanners has been optimised to meet the needs of product development and engineering professionals on the lookout for the most effective and reliable way to acquire 3D measurements of physical objects.

Building on its core assets, Creaform's flagship metrology-grade scanners recently underwent a complete re-engineering process and they are now more portable and faster than ever before. The result is an accurate and high resolution 3D scanner that remains remarkably simple to use. The two models in the range, the HandySCAN 300 and HandySCAN 700, are the most efficient way to reverse engineer or design a component.

The HandySCAN 300 is the entry level machine that takes portable measurement to the next level with its 122 x 77 x 294 mm dimensions and 0.85 kg weight. Providing a scanning area of 225 by 250 mm, and with a measuring rate of 205,000, the HandySCAN 300 implements three laser crosses as its light source. In a laser class that is completely safe for eyes, the HandySCAN300 delivers measuring excellence with a wealth of safety features. The measuring resolution for the HandySCAN 300 is 0.100 mm with an accuracy that can measure down to as little as 0.04 mm with a volumetric precision of 0.02 + 0.100 mm. This precision level can be met with a stand-off distance of 300 mm and a depth of field of 250 mm. In essence, this makes the Handy SCAN 300 ideal for measuring anything from 0.1 to 4 m dimensions.

The impressive HandySCAN700 variant has identical physical dimensions as the 300, but offers a scanning area of 275 mm by 250 mm, with a measurement rate of 480,000. Furthermore, it offers customers an increased volumetric accuracy of 0.02 + 0.06 mm and a resolution of 0.050 mm.

The HandySCAN 3D units utilise Creaform's VXelements software that complies with a number of output formats and compatible software, including Catia, Solidworks, PROEngineer, NX, Solid Edge and Autodesk Inventor. The connection is made via a standard USB3 port.

Also available, and completely integrated into VXelements is Creaform's new VXmodel software, a post-treatment software that allows the 3D scan data to be finalised and used directly in any 3D printing or CAD software system. The new VXmodel provides the simplest and fastest path from 3D scans to your computer-aided design or additive manufacturing workflow. A great addition to the Creaform 3D scanners, VXmodel is simple but powerful, including only the features necessary to complement the customers CAD software.

For manufacturing companies conducting first article inspection (FAI) or quality control, Creaform has also introduced its new VXinspect software that can also be fully integrated into VXelements. This intuitive and powerful 3D inspection software provides the simplest integration of probing and scanning measurement capabilities.

The combination of Creaform technologies with VXinspect offers the ideal solution for quality control in shop floor conditions. The software features all the functionality required by pre-production control or when setting up a high-efficiency measurement sequence to inspect multiples parts. With its intuitive interface, it is the best solution for all inspection workflow with no compromise on measurement quality.

For further details on these handheld innovations, the associated software or to discuss any general metrology issues that you may have, visit the Measurement Solutions stand at MACH to speak to the company's engineers and view the extensive solutions.

**Measurement Solutions**
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**MACH • Hall 5 • Stand 5602**

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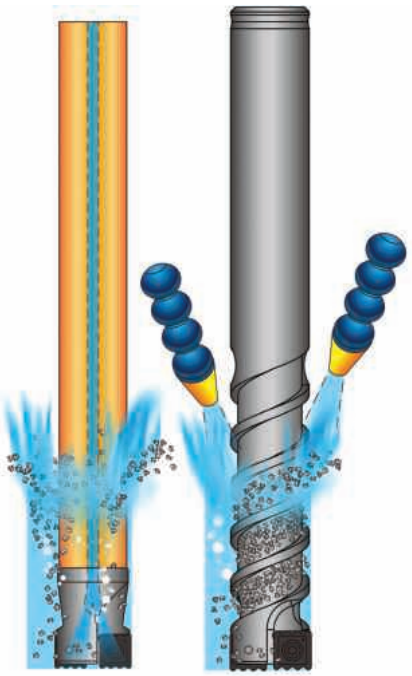
# ACT returns to MACH with new drilling lines

The innovation behind the tooling lines offered by Advanced Carbide Tooling (ACT) at MACH 2014 prompted visitors to take the unprecedented step of using their company credit cards and buying tools directly from the ACT stand. With the Nine9 line of NC Helix Drills and engraving tools once again returning to MACH, visit the ACT stand to benefit from the many 'show' offers that will be available.

ACT will be giving show visitors the added incentive of taking up to the company's latest offer of buying the NC Helix Drill tool holder and getting two free inserts. The impressive multi-functional NC Helix Drill from Nine9 has been developed to eradicate 'non-cutting' times through its ability to conduct helical interpolation milling, ramping, slotting, counter-boring and drilling with a single tool. This flexibility is emphasised by the requirement for just six different tools for drilling precision holes from 13 to 65 mm diameters.

Working on an interpolation cycle, the NC Helix Drill reduces the cutting load on the spindle by ramping at an angle up to 20 degrees whilst the sinusoidal 'wavy edge' insert edges break the swarf into fine chips that are easily evacuated from the hole. This excellent swarf control applies to the most difficult to machine materials. In addition, the drill body is available with either a cylindrical shank or as a screw fit holder that can fit most toolholder extension bars on the market. The drills are available with or without through coolant facility for rapid swarf evacuation.



Corresponding with the NC Helix Drill is an insert with two cutting edges per insert and serrated cutting edge geometry. Produced from a K20F micro grain carbide substrate that is TiAlN coated, the grade and geometry provide remarkable tool life on all types of material from aluminium, carbon steel, low and high alloy steel, stainless steel, cast iron, nickel and titanium alloys. The drill body is offered with shank diameters of 10, 12, 16, 20 and 25 mm for drilling holes from 13 to 20 mm, 15 to 25 mm, 20 to 30 mm, 25 to 40 mm, 30 to 50 mm and 42 to 65 mm diameters.

Complementing the NC Helix Drill at MACH 2016 will be the Nine9 Series of deburring tools. Developed to achieve high speed and feed deburring and countersinking on all types of machine tools from sliding head lathes through to machining centres, the Nine9 deburring range offers productivity and tool life far beyond existing technology. The NC deburring tools can run at feed rates up to six times faster than alternative solutions. This is due to the single edged TiAlN coated carbide inserts that have a 6-flute edge geometry that enables ground breaking machining parameters to be realised. Capable of deburring and countersinking hole diameters as small as 0.5 mm, the high precision series is the tool of choice for processing 60 and 90 degree chamfers with depths from 0.1 to 1.75 mm. The toolholder is ground to an h6 tolerance and manufactured from a high alloy steel to prolong the tool life of both the 6 mm diameter toolholder shank and the insert. The toolholder has a brazed carbide shank that eliminates vibration and extends insert life.

You can view the new Nine9 NC Helix Drill from ACT at: **https://www.youtube.com/watch?v=Lj_FJwFCrxE**

**Advanced Carbide Tooling Ltd**
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Cincom Miyano

# ITC's new spin on micro-machining at MACH

When considering the purchase of a CNC machine tool, it becomes apparent that selected options are focused on specific applications. The machine tool is designed to run a pre-selected range of tool types and sizes that are based on factors such as horsepower, accuracy, flexibility and speed. Now, with the arrival of the BIG KAISER Air Turbine Spindles, Industrial Tooling Corporation (ITC) will be changing the rules.

At present, high-end CNC machines are achieving 60,000 rpm to facilitate micro machining with small-diameter cutting tools. These speeds bring balance and dynamic run-out issues that are difficult to manage when using large tool holders. By shrinking the rotating portion of the spindle, the user improves control of run-out and balance. This is where the new spindle speed increasers can be applied. They are much smaller and weigh substantially less than a typical machine spindle. The largest turbine assembly in the new BIG KAISER RBX line has an effective diameter of just 75 mm. The entire speeder weighs just 5 kg. The light weight RBX allows operators to focus on the dynamic run-out and balance issue that makes high-speed micro machining difficult.

The BIG KAISER air-powered spindles to be shown MACH 2016 use compressed air to drive a turbine and develop much higher spindle speeds than a conventional machine spindle. An instant benefit is that the machine spindle doesn't rotate when running a speeder, so it incurs no wear and tear. Furthermore, the use of air pressure as an energy source eliminates problems associated with the heat generated when a machine tool spindle runs near its maximum speed for prolonged periods. Without any heat build-up, the BIG KAISER air-turbine spindles can operate continuously during the long cutting cycles that go hand in hand with the light chip loads micro-tools require. An added benefit of an air-turbine unit is that it generates a noise level below 65 dB.

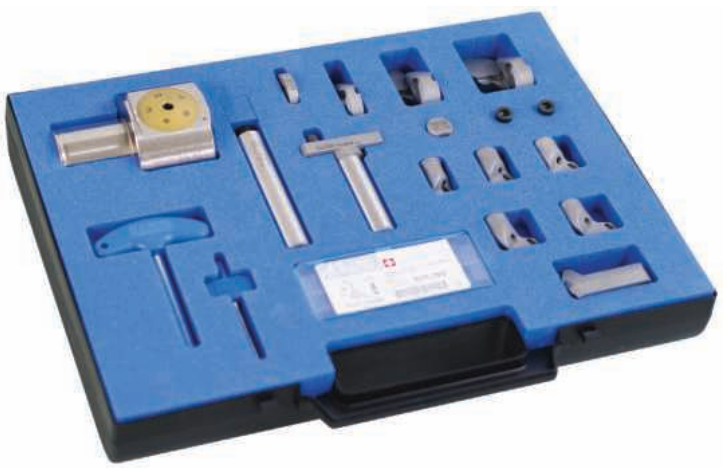
**Higher speed, lower torque**

One essential factor users should keep in mind when considering an RBX spindle is that when output speed increases, available torque decreases. The RBX5 covers spindle speeds from 40,000 to 50,000 rpm. The RBX7 handles the 60,000 to 80,000 rpm range and the RBX12 delivers spindle speeds from 100,000 to 120,000 rpm. The torque ranges of these three units establish guidelines for tool diameters and the machining processes they can perform. The lowest-speed unit addresses drill and end mill diameters up to 1.5 mm, depending on the stability of the setup. At speeds greater than 100,000 rpm, drill diameters max out at 0.4 mm and end mills at about 0.6 mm.

Thermal displacement of less than 1.2 µm on the RBX, combined with a high accuracy tool holding system, addresses many of the requirements for running micro cutting tools. As cutting tools get smaller, the necessary spindle speed for proper tool use increases.

As the air pressure powering a speeder rises above 45 psi, spindle speeds will increase. The maximum required air pressure to achieve the top speed in any range is 90 psi. Regardless of the drive mechanism used, most problems associated with high-rpm micromachining are caused by poor dynamic run-out of the machine spindle and its attached cutting tool assembly. BIG KAISER has integrated its air-turbine drive mechanisms directly into a proven high-speed tool-holding solution, a micro-collet that clamps tool shanks with diameters as small as 0.5 mm. This extremely high clamping force and low run-out of 3 µm at four times tool diameter increases tool life and improves finish, compared to a conventional collet system.

For further details on how you can improve productivity, prolong spindle longevity, improve precision and tool life whilst improving the capabilities of your existing machine tool, using the BIG KAISER range of RBX high-speed spindles, contact:



**Industrial Tooling Corporation (ITC)**
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# Citizen creates a wave of turn-milling technology at MACH

MACH 2016 has been selected by Japan for the European launch of the latest modular designed 5-axis Citizen Cincom A20-VII CNC sliding head turn-mill centre. The machine has a bar capacity up to 25 mm as an option and the ability to be reset between guide bush and non-guide bush for economic machining of shorter workpieces. In all, a wave of 12 CNC machines from the Cincom and Miyano fixed head range of turn-mill centres are planned for demonstrations of the very latest developments in machining technology on the Citizen Machinery UK stand at MACH.

From the Citizen stable, will be seven machines including the European launch of the Cincom A20-VII with 21 tool capacity, high speed 10,000 revs/min spindle and 200 mm machining length per chucking plus five machines representing the latest 'icon reinvented' internationally top-selling L-Series.

With each L-Series machine featuring guide bush/non-guide bush capability, the line-up includes a 7-axis L32-XII with B- and Y2- axes, an entry level 5-axis L32-VIII, a 5-axis L20VIII and a L20XII with B- and Y-axes. There will also be installed a Cincom L12-VII having a high speed 15,000 revs/min spindle. A top-of-the-range M32 will be installed with a high level VIII specification having B-axis contouring and 4-axis simultaneous control.

Meanwhile, five machines under the Miyano banner will include the latest 'cost-effective' sixth generation of BNJ-51SY6 with robot loading, overlapping main 12-station and 6-station sub-turrets, a 7-axis BNE-51MSY with an 11 kW main spindle is able to provide three tool simultaneous cutting and two versions of the BNA. The BNA-42DHY has a Y-axis main turret and compact sub-turret enabling simultaneous left and right approach processing and the BNA-42GTY with up to 45 tools and 3-axis control enables group overlapping of tools to provide even higher productivity.

Also on the Citizen stand will be the compact, high precision GN3200W twin-spindle lathe with integrated high speed gentry loading and part transfer.

Five versions of Citizen's latest Cincom 'icon' L-Series CNC sliding head turn-mill centres will be shown at MACH 2016

**Citizen Machinery UK Ltd**
**Tel: 01923 691500**
**Email: gbryant@citizenmachinery.co.uk**
**www.gbryant@citizenmachinery.co.uk**

**MACH • Hall 5 • Stand 5640**

# Shop floor access to order processing data

Heidenhain will use MACH 2016 to demonstrate the ease with which digital data can be transferred to and from its high-end TNC 640 CNC system for controlling machining centres and mill-turn centres. Functionality enables all participants in a paperless order handling environment, including design, programming, simulation and production planning staff as well as machinists on the shop floor, to communicate and exchange data seamlessly.

Standard features of the control provide access to manufacturing process data through a CAD viewer, PDF viewer, image viewer and built-in web browser. Operation of web-based documentation software or ERP systems is possible, as is access to a user's email inbox.

Option 133 Remote Desktop Manager provides an expanded solution for integrating the TNC 640 into the process chain. A push of a button on the control keyboard is all it takes to switch between the control screen and the screen of a Windows PC. It can be a computer in the local network or an industrial PC, such as the Heidenhain IPC 6641 in the machine's electrical cabinet. This gives the machine operator direct connection from the control to all data handling systems in the process chain, including access to management systems, documentation and visualisation information. Even CPU-intensive CAD/CAM tasks do not affect machining performance.

The TNC 640 is Heidenhain's latest, high-performance milling control and in addition offers optional control of turning functions on a machining centre. It uses plain language programming and has an optimised interface that gives users unrivalled insight into system operation.

Functionality for mill-turn centres includes simple program-controlled switchover between milling and turning, comprehensive canned turning cycles for frequently repeated operations such as roughing, finishing, recessing and thread cutting, constant surface speed, and tool-tip radius compensation. Universal and high speed milling cycles are included, such as fast block processing, short control loop cycles and rapid data transfer. The system's selectable, split screen mode shows part-program blocks in one half and graphics or status display in the other. A smartSelect function presents users with dialogue guidance for selecting functions quickly and easily, rather than using soft key format.

Program creation with graphical support while another program is running is provided, and management of a tool changer and a pallet changer is available.

**HEIDENHAIN (GB) Ltd**
**Tel: 01444 247711**
**Email: sales@heidenhaingb.com**
**www.heidenhaingb.com**

**MACH • Hall 5 • Stand 5648**

# Sodi-Tech brings leading-edge technology to MACH

MACH 2016 will provide a UK debut for Sodick's unique combined 3D Printer /Milling centre, plus demonstrations of Sodick's best-of-breed wire and sink EDM machines.

Seen for the first time in the UK, the new Sodick OPM250E metal 3D printer with integral linear motor drive milling centre will be demonstrated on the Sodi-Tech stand. This revolutionary machine represents the industry's first one-step solution for the entire metal 3D printer process and is ideally suited for applications in sectors including aerospace, automotive, defence and pharmaceutical.

So, how does it work? In the simplest terms, the process is as follows: first, a metal powder is uniformly coated and then melted and solidified by scanning with a laser beam (this process can be repeated up to ten times), after which the surface is subjected to high speed milling with a rotary tool. Then the metal powder is uniformly coated again and the process is repeated until the component geometry is complete. Using this combination of procedures, the OPM250E is able to achieve the high quality accuracy, precision and finish which are not possible by the use of a laser process alone.

The development of this unique machine is the result of Sodick's many years of research and experience in machine tool manufacture, creating a range of critical component technologies that work together to produce leading-edge manufacturing solutions.

Benefiting from the same pedigree, the best-selling Sodick AG60L die-sink machine, which will also be on the stand, features all of Sodick's latest technological innovations, including linear motor drives to the X, Y and Z axes, and both an electrode wear reduction circuit and a fine finishing circuit to ensure optimum manufacturing efficiency. In addition, the energy saving capability of the machine can reduce average energy consumption, compared to conventional EDMs, by up to 60 percent.

Sharing the limelight, the SLC600G is a brand-leader among Sodick's wire EDM machines, and in addition to linear motor drives to the X, Y and Z axes, includes


features such as a full security enclosure and Smart Pulse Wire control with the Smart Pulse Generator and a multitude of technologies to improve cutting speed and precision.

**Sodi-Tech EDM Ltd**
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**www.sodi-techedm.co.uk**

**MACH • Hall 5 • Stand 5470**

# Starrett makes a two booth commitment to MACH

The L. S. Starrett Company will have two stands at this year's Mach show, reflecting the company's developing product ranges and continued commitment to the UK market.

In the Metrology Zone, in Hall 5, Starrett will show the latest enhancements to the company's range of optical profile projectors and video measuring systems, including the introduction of LED lighting on all its profile projectors. Benefits from this change include an improvement to the quality of light, a predicted increase in service intervals from one year to approximately five years as a result of the change in bulb type, and a reduction in energy consumption, creating considerable savings in energy costs over the life of the projector. In addition, the heat generated by the LED bulb is a small fraction of that generated by a traditional bulb, making the projector much cooler, particularly after a period of continuous use.

Stand 4314 in Hall 4 is in the heart of the bandsaw section of the show and Starrett will be showing the very latest in its bandsaw

machines and blades. New to the band saw machine range is the S1005 portable band saw machine. This is an ideal tool for any tradesmen, maintenance engineer and workshop, offering lightweight and consistent high quality performance. The machine is supplied with the Univerz blade from Starrett, designed specifically to cope with the fatigue stresses caused by the small band wheels used in small portable band saw machines.

At the other end of the range, the S4240 semi-automatic bandsaw machine has a cutting capacity of 300 mm x 300 mm and will mitre cut up to 75° and -45°. Its rigid construction ensures that this machine can offer a smooth, controlled cutting speed with hydraulic feed pressure. All the machines on the stand will be operational, conducting cutting demonstrations throughout the course of the exhibition.

Starrett Advanz MC5 and MC7 are the latest additions to the Starrett Carbide Tipped bandsaw blade range and feature two unique tooth profiles that form either five or seven chips. Advanz MC5 is ideal for tool steels, inconel and titanium and MC5 is ideal for automotive aluminium casting blocks, cast iron, bronze and copper.

**The L. S. Starrett Company Ltd**
**Tel: 01835 863501**
**Email: jcove@starrett.co.uk**
**www.starrett.co.uk**

**MACH • Hall 4 • Stands 4314**
**Hall 5 • 5950**

# Fenn to premiere new product lines

Fenn will be showcasing several key product ranges from across its extensive portfolio during the week-long exhibition, including the new trochoidal end mill 'Speedtwister' and an Ezset IC2 presetting machine, which is new to the Fenn collection for 2016. Also on show will be a range of milling, drilling, threading and turning products, specialist boring solutions and heat-shrink and balancing technology.



As the UK agent for a number of carefully selected, unique European brands, Fenn is able to offer market leading tooling, fully integrated tool management systems, inventory control systems, pre-setting, heat-shrink and balancing systems; all carefully selected to ensure customers receive the very best performance from tooling and systems alike. This allows Fenn to meet the demands of all industries within the market and supply complete tooling packages for customer projects, from conception to completion.

Special attention will also be paid during MACH to Fenn's own UK-manufactured brand of Fetoga milling cutters. After launching its manufacturing facility back in 2000, Fenn has seen continued development and growth, and their reputation within the industry has been underpinned by the success of its Fetoga Solid Carbide Endmill Range, which saw some new introductions in Fenn's new solid carbide end mill catalogue during summer last year.

Although the Fetoga line boasts an impressive range of products, Fenn understands that many customers may have requests for non-standard, bespoke tools. Fenn's Custom Tool Division is dedicated to the design and manufacture of special tooling for the more unique applications customers encounter. On display will be a selection of specialist tooling with technical engineers onsite to discuss customer requirements.

**Speedtwister premiered**

Fenn is proud to give its first debut during MACH of the all-new Maykestag 'Speedtwister' which was launched in January 2016. Especially developed for speed trochoidal cutting, the Speedtwister is suitable for conventional and dynamic milling strategies. With huge cutting depths of up to 5xD, high tech coating technology and optimised tool geometry for perfect chip control, the Speedtwister provides increased productivity and profitability.

The Speedtwister, combined with the trochoidal milling paths of modern CAD CAM systems, offers substantially increased cutting speed and feed rates as opposed to conventional slot milling applications.

Optimised tool geometries provides perfect chip control, smooth vibration-less running and excellent surface finishes, and with the most up to date high-tech coating the Speedtwister achieves maximum metal removal rates in both wet and dry machining.

Suitable for both rouging and finishing and offering a Universal and Inox range in both 3xD and 5xD, the Speedtwister is suitable for general steels up to approx. 50 HRC as well as stainless steels, inconel and titanium, among others.

**Ezset Presetters**

As newly appointed UK agents for Ezset, Fenn will validate the benefits of presetting and offer customers the opportunity to see an Ezset IC2 tool presetting machine, which will be demonstrated throughout the exhibition. Manufactured in Germany, Ezset consists of four models and is designed with ease of use in mind, while offering the very latest in image processing software. Featuring brand quality components such as Bosch pneumatics, THK guides and Heidenhain scales, Ezset delivers precision, unbeatable price/performance ratio and a maintenance-free service life. This cost-effective, yet high performance, tool presetting range will significantly increase productivity, reduce scrap parts and lower tooling costs.

Fenn's team of technical engineers will be on hand throughout the exhibition to answer any questions, discuss the benefits of the various products and how they can help improve customer productivity and profitability, as well as to offer demonstrations on the heat-shrink, balancing and presetting machines.

Customers can also take advantage of special Fenn offers during the exhibition, including 10 percent off pre-setting machines ordered during MACH or within four weeks, tooling vouchers for customers opening new accounts and special discounts across standard products purchased during the event.

**Fenn Tool Ltd**
**Tel: 01376 347566**
**Email: sales@fenntool.com**
**www.fenntool.com**

**MACH • Hall 5 • Stand 5261**

# Ajax to mark 75 year anniversary at MACH

Machine tool builders steeped in the same level of pedigree as Ajax Machine Tools are few and far between. This year, the Hampshire company is celebrating 75 years of manufacturing excellence in the UK and at MACH the company will be drawing visitors attention to the build quality of its machine tools, a quality that only comes from a manufacturer with a long tradition of machine building.

The Ajax Halifax factory in 1954

The Ajax Machine Tool Company Ltd of Halifax was conceived in 1939, the same year that marked the start of the 2nd World War. The following year the doors opened for business. Just another year later in 1941, the company's name was shortened to 'Ajax', after the HMS Ajax cruiser warship was adopted by the town of Halifax during World War II. For those with a thirst for naval history, the HMS Ajax was in the Battle of the River Plate and it was one of three cruisers that attacked and forced the German battleship Admiral Graf Spee to port. Whilst in port, the captain of the Graf Spee decided to scuttle the vessel to prevent it from being sunk by the British Navy.

1962 Ajax universal milling machine

Like many companies in the day, production volumes were determined by the demands of post-war nations and Ajax was no different and a subsidiary company 'Ajax Domestic Appliance' was established to benefit from the UK's increasing demand for washing machines.

During the 1940's, Ajax was continually innovating and in 1945 the company presented its new vice with one fixed jaw and one floating jaw, undoubtedly a technological revelation in its day. In1960, the company was acquired by Philips Electrical and, just two years later, the appliances and machine tool businesses were separated. During the 1970's the company relocated to the Ajax works site in Stockport and it underwent numerous acquisitions through the 1970s to 1990's, until a 2001 acquisition by the Viking Group saw Ajax leave its Northern roots and move to Birmingham.

The final acquisition of this remarkable brand of British machine tools occurred in 2002, when current owner William Savin relocated the company to Hampshire and set about bringing the company back it its former glory days. Little over 10 years into this challenge and Ajax is increasing to move forward with a new range of machine tools that are built more cost-effectively, more efficiently and with greater technological


Ajax machines that will be shown at MACH 2016

advances. Now, 75 years on from its inception and Ajax is once again leading the way in British built machine tools.

If you want to reminisce over the joys of your old Ajax machine and also see how the company has progressed through the decades, come and speak to the company's engineers at MACH. The Ajax team will be delighted to introduce the current range of milling, turning, drilling, boring, grinding, cutting and forming machinery for the challenges of the modern manufacturing landscape.

**Ajax Machine Tools International Ltd**
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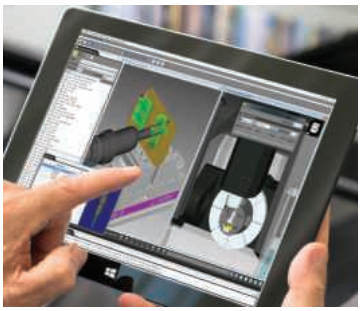
**MACH • Hall 5 • Stand 5194**

# You make it, VERICUT simulates it



CGTech will feature the latest version of VERICUT, V7.4, CNC machine simulation, verification and optimisation software on its stand at MACH.

VERICUT simulates the CNC machining process for large, small, simple or complex parts and all types of CNC machining, including drilling and trimming of composite parts, waterjet, robots and mill/turn. It operates stand alone, but can also be integrated with all leading CAM systems.

VERICUT 7.4 includes many enhancements that further simplify the process of simulating a CNC machine. Changes to how users interact with VERICUT further improve VERICUT's workflow and simplify day-to-day NC programming and simulation use.

**7.4 enhancements for ease-of-use**

VERICUT's desktop is enhanced with a new docking method enabling VERICUT's desktop to be configured in the most efficient manner. Additionally, the Status window is completely redesigned for better viewing, customisation and size. The popular "Favourites" feature has been enhanced to automatically read all sub-folders in a directory. There is also a new Welcome screen allowing access to popular features, samples and help.

**Tool management simplified**

A new Tool Bar provides easy access to all features needed to create and maintain tool libraries, create/modify tool assemblies, import tool assemblies and create or import OptiPath records. Also, in the Tool List, tool components now have a Parent/Child hierarchy allowing for better tool assembly management and modification. All Tool Definition windows have been redesigned to make tool definition easier. VERICUT 7.4 ships with a library of common tools and also features seamless connectivity with Kennametal's NOVO™, Iscar's IQCloud™, and other tooling suppliers via the Machining Cloud™, making it very quick and simple to add new tools to a simulation session.

**VERICUT Reviewer**

Machine movements can also be simulated while stepping or playing backwards in VERICUT's Review Mode. With VERICUT Reviewer shopfloor personnel, suppliers, customers, and other production engineers can view animations of the CNC machining process. This stand-alone viewer does not use a license and can play forward and backward while removing and replacing material.

At MACH 2016 CGTech will have an exclusive VERICUT Reviewer demo bar, featuring the Reviewer PC version on both laptops and Windows tablets, plus demonstrations of the Ipad Reviewer app. Visitors to the stand can take advantage of live demos as well as the opportunity to get a hands on trial of Reviewer for themselves.

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**MACH • Hall 4 • Stand 4021**

# Celebrating 60 years at the forefront of sawing technology

For Addison Saws, MACH 2016 won't simply provide an opportunity to present some of the very latest CNC sawing and cutting technologies to UK-based manufacturers and fabricators. Established in 1956, the Stourbridge business also plans to use the exhibition to mark its 60th anniversary. Managing director, Gary Knight comments: "As the company that introduced a new breed of metal sawing machinery to the UK all those years ago, it seemed only fitting that we should use MACH 2016 to both celebrate our 60 years in business and showcase some of the very latest cutting innovations."

Accordingly, visitors to Addison's impressive 170 $m^2$ stand will be able to do much more than join in the company's anniversary celebrations. Addison will be demonstrating a wide range of automated sawing solutions, a high-speed Mecal MC 307 Falcon 4-axis CNC machining centre and a CSM all-electric hybrid push bender from sister company, Tubefab.

"The technologies we will be presenting have all been handpicked to inspire manufacturers and show the immense benefits that can be brought to their production strategies," adds Gary Knight. "For example, alongside the Mecal CNC machining centre, we will be demonstrating a new automatic saw from Tronzadoras. With Y-axis drilling capability on varying centre lines, it offers a wide range of exciting options for manufacturers of small components."

**Mecal MC 307 Falcon with X-axis traverse speed of 150 mpm**

Widely believed to be the fastest aluminium machining centres of their kind, Mecal MC 307 Falcons have an X-axis traverse speed of 150 mpm, almost double that of their nearest rival. Other standard features include five automatic, individually motorised vices and an A-axis profile rotation from +135° to -135° for working three sides of each component. Fibre optic plc communication ensures rapid data transfer, while absolute smart motor servo drives deliver ultra-precise performance.

**Steel and aluminium cutting technologies**

The saws on display at Addison's MACH 16 stand will include the all-new Everising H460 HB NC fully automatic enclosed bandsaw, a large-capacity Tronzadoras TL600 semi-automatic rising blade aluminium mitre saw and the Tronzadoras GAA350 TR12 CNC aluminium vertical cut-off saw with Y-axis drilling capability.

A newly released IMET twin pillar semi-automatic bandsaw will also be on show, as will IMET's revised SIRIO 370 vertical action cold saw and their new X Smart fully enclosed bandsaw, a heavy duty machine purpose-built for cutting cast iron, steel and high-strength steels.

"We are looking to include the widest range of innovative, new technologies," says Gary Knight, "so one or two models may be switched in the run up to the show."

**CSM tube benders for accuracy, repeatability and reliability**

Finally, a CSM 50TBRE multi-stack, 4-axis all-electric hybrid tube bender from Tubefab will also be on display. Tubefab's CSM benders are rapidly gaining recognition for their uncompromising repeatability and reliability, with linear/radial accuracy to 0.01mm/degrees, while providing highly affordable solutions to some of the most challenging tube forming applications. Tubefab offers the entire range of CSM tube bending machines, from basic 3-axis hydraulic models to sophisticated, 11-axis, all-electric machines.

**Leading the way in sawing technology for 60 years**

Established in 1956, Addison Saws brought a new breed of metal cutting solutions to the UK and, in doing so, created a whole new market for bandsaws and circular saws. Today, 60 years on, Addison Saws continues to lead the way in metal cutting technologies and offers an extensive range of full CNC machine tools, from the world's premier industrial machine manufacturers; all supported by uncompromising levels of customer care.

The Addison Saws product range includes everything from simple, manually operated machines to highly sophisticated, fully automated sawing lines and has recently been increased with the addition of heavy duty 3, 3+1, 4 & 5-axis long-bed multi-piece machining centres.

Addison Saws is part of the Addison Group, an organisation that also includes sawblade re-manufacturing specialist Dynashape, and tube-bending technology specialist, Tubefab.

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**MACH • Hall 4 • Stand 4627**

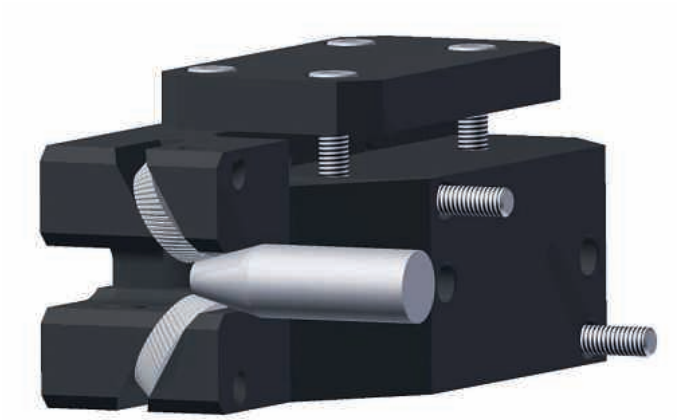
# Floyd to make its mark at MACH

For UK manufacturers producing small components that demand the utmost in precision, the Floyd Automatic Tooling stand at MACH 2016 should prove a worthwhile visit for subcontractors. Of particular interest to small turned component manufacturers attending the show will be the impressive range of ZEUS knurling and roll marking tools from Hommel & Keller.

The industry leading knurling tools from Hommel & Keller will be showcased at MACH, where Floyd Automatic engineers will demonstrate how cycle times, knurl quality and precision can be taken to a new plateau with the ZEUS Series of tools.

Floyd Automatic's managing director, Richard Floyd says: "While there is a wide range of different knurling tool solutions for both form and cut knurling, there are occasions where standard tooling will not suffice. Under these circumstances machine shops and engineers can turn to this well-established brand that is noted for its quality, reliability and innovation."

"We have been established as knurling specialists for over 25



Zeus Roll marking tool from Floyd

years and, combining our expertise with the product designers from Hommel & Keller, we can offer specialist knurling solutions that resolve the most difficult of applications. In many cases, customers require a special interface to achieve the best results for their machine and processes, and it is here that our range of Capto, HSK and VDI fittings is unsurpassed."

The expansive line of ZEUS marking and knurling tools can be applied to aesthetic applications such as gear knobs and watch crowns whilst conical knurling tools are ideal for components such as windshield wiper shafts. In addition, the specialist manufacturer can resolve complex issues with its range of face knurling, internal knurling and small diameter application specific tools. The knurling and roll marking experts from Floyd Automatic and Hommel & Keller can also design roll marking tools for unusual marking applications.

So, if you have a particularly challenging part and you need a knurling or marking solution, visit the Floyd Automatic Stand at MACH.

**Floyd Automatic Tooling Ltd Tel: 01462 491919**
**Email: info@floydautomatic.co.uk www.floydautomatic.co.uk**

**MACH • Hall 5 • Stand 5036**

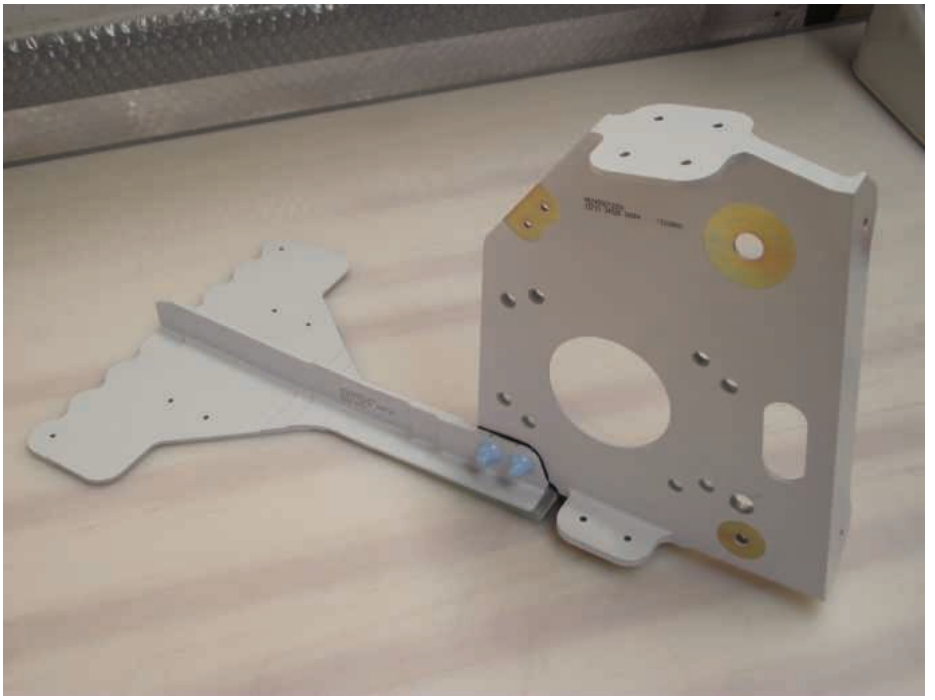
# Edgecam resolves complex aircraft parts challenge for Phoenix

**"Designers often come up with parts that are difficult to manufacture. Edgecam's powerful 5-axis capability overcomes that for us by producing good, reliable NC code to machine complex components."**

Those are the words of John Tolson, technical director at specialist aerospace subcontractor Phoenix CNC Engineering. Ninety percent of the company's work is manufacturing aerospace components and order books are growing at a considerable rate.

Managing director Glenn Richardson says in particular they will be working on one customer's aircraft, and changing focus from a speedshop to more long-term strategic work. The company has recently been acquired by Universal Engineering, which he says guarantees substantial investment to keep Phoenix ahead of the game.

Currently operating out of 16,000 square foot premises on the Derbyshire/ Nottinghamshire border, Phoenix is looking at the possibility of moving into a purpose-built 40,000 square foot complex in the next two years. Annual turnover now stands at more than £ 6m and at least 20 batches of parts are produced daily.



"We manufacture hundreds of different types of components and there can be over 1,000 job cards going through the factory at any one time," explains John Tolson.

The leading edge and trailing edge milled parts are predominantly airframe components for aircraft wings, mainly bracketry for ribs produced from aerospace spec aluminium and titanium.

Phoenix recently added a further two 5-axis CNC machines to their tally of 22 machine tools, comprising DMG MORI , Haas and Hardinge, driven by the game-changing Edgecam CAM software. John Tolson has used Edgecam from Vero Software and its predecessor Pathtrace for more than 25 years, and now finds its powerful 5-axis capability to be particularly important:

"For example, if a component has a number of holes around a particular bracket, we have to write several different programs for a complex component on a 3-axis machine, and we may be cutting it in four or five operations. But this can be done in just one setup on our eight 5-axis mills, reducing setting errors and saving a considerable amount of time."

This is achieved through a number of aspects, for example, orienting the tool to maintain optimum tool-to-part contact at all times improves surface finish and extends tool life. Also, 5-axis machining improves access to undercuts and deep pockets. Tilting the tool or component allows shorter series tooling to be employed, eliminating the need for secondary setups. Also as the cutter can be presented to the component at any angle, it reduces the amount of

fixturing required. Another important consideration for John Tolson is the ability to seamlessly import third-party CAD files:

"One of our main customers uses Catia to design their components, and Edgecam's associativity with those models reduces errors. Driving a 5-axis toolpath around that model is absolutely invaluable to us."

A second piece of software from the Vero stable helps Phoenix to comply with the aerospace industry's demand for traceability. The Javelin production control system is the mainstay of their office and shop floor procedures.

Production planner Gary Jordan says: "As well as running Javelin on a number of computers in the office, we also have a full license in the inspection department, and three Shop Floor Data Capture terminals in the production area."

As Javelin has its roots in the aircraft industry, he says it was the perfect robust system for assisting their move away from being a "speed shop" to focusing on long term projects:

"Complete traceability is non-negotiable to the aircraft industry, which makes Javelin's powerful Materials Control function essential to our success. Because

Javelin fully integrates everything we do, we're using it to purchase all materials to the correct specification, and issuing the planned release of materials from our stores to the job card, along with the Goods Received Notes for all materials. This means we can provide complete traceability, which is a massive selling point for us."

Javelin's Shop Floor Data Capture function lies at the heart of their production process. It shows the status of every job on the shop floor, and gives the ability to drill down to all the key information. This is particularly valuable when customers ask about their job."

Shop floor workers log on to Javelin with their own personal bar code, then a particular job and operation.

"Each job usually has at least two milling operations, some will have three, some four, all of which are captured on Javelin, continues Gary Jordan. "Logging all operations in this way, which only takes seconds, keeps us in complete control of every aspect of production."

SFDC also enables them to pull up the status of each CNC machine, either by operator or work centre, showing whether they are setting or machining.

Glenn Richardson concludes: "One customer has 15 years' worth of orders ahead for its new aircraft and Edgecam and Javelin ensure we have the opportunity to be part of that."

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**www.javelin.verosoftware.com**

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# New facility for subcontract machining of aircraft structurals

A new, 17,500 sq ft factory was opened in October last year by Burnley subcontractor, BCW Engineering and a second, similar unit is being built next door specifically to drive the firm's expansion in the aerospace industry. The extra floor area brings the total factory space occupied by BCW in Burnley to more than 100,000 sq ft.

The company's latest two buildings and the acquisition of three new machines, two large-capacity machining centres and a coordinate measuring machine (CMM), represent an investment of over £1 million. One of the machining centres, a Japanese-built 5-axis Makino MCD 2016 horizontal-spindle, twin-pallet model, is noteworthy as being one of only four such machines in the UK, the other three being under one roof in the South West.

Interestingly, BCW's technical director and group engineering director both worked for another aerospace subcontractor where the machine was previously installed. Together with engineers from Track Machine Tools Ltd, a division of BCW Engineering, and supported by the service department at NCMT, Makino's sole UK agent, they were responsible for refurbishing the MCD 2016 over a 10-week period.

The machine promotes BCW's status in the aerospace supply chain. It has a working envelope of 2,000 x 1,600 x 1,300 mm and the rotary table can accept workpieces weighing up to 10 tonnes. The 50-taper spindle with through-spindle coolant is rated at 15,000 rpm / 50 kW, making it ideal for machining aluminium structurals for aircraft. Indeed, the machine specification when it was built in 2007 was for the manufacture of Airbus gear ribs.


A large fixture being manoeuvred onto the second pallet of the Makino MCD 2016

With this in mind, a 99-position tool magazine was provided, as well as a 25-degree angle head positioned by a 360-degree C-axis and exchanged with the assistance of a semi-automatic, powered head changer. Linear scales are fitted in X, Y and Z for high precision positional feedback to the Makino MPC-2 / Fanuc 16MC control. Operation of a similar machine may be viewed at **www.youtube.com/watch?v=aGYAekRupb4**

A Dahlih DCM 3216 gantry-type, three-axis, vertical-spindle machining centre with 3,000 x 2,000 x 1,600 metre working envelope and a large Wenzel gantry CMM complete this round of investment by BCW, a company that since its launch in 2002 has continually reinvested heavily in plant, personnel and infrastructure.

The latest equipment joins many smaller prismatic metalcutting machines and turn-milling centres in other factory units within BCW, where aircraft parts have been produced virtually since the company was established. They include engine parts, landing gear equipment and safety-critical items, machined from a variety of materials.

Operations director Trevor Cassie says: "Manufacture of aircraft parts has always been a key focus at BCW, as evidenced by our accreditation to AS9100 Rev C in 2010.

"We also hold many customer-specific approvals, including Safran and BAE Systems since 2008, Aircelle a year later and Messier Dowty in 2012, both part of the Safran group, Wesco Aircraft, Unison GE and most recently GKN Aerospace, which we gained in August 2015.

"The North West is home to the largest aerospace cluster in Europe, adding over £7 billion to the UK economy, according to The North West Aerospace Alliance, of which we are a member."


BCW's group engineering director and technical director are reunited with the now-refurbished Makino MCD 2016 machining centre that they operated eight years ago at another aerospace subcontractor in the North West

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**Email: Trevor.Cassie@bcw-engineering.co.uk**
**www.bcw-engineering.co.uk**

# Mollart wins second export aerospace order for BTA turnkey operation

Following the success of Mollart Engineering's initial installation of a turnkey project around a BTA deep hole drilling machine on behalf of an Eastern European aerospace contractor, for producing a series of deep and blind holes in a range of aircraft actuation devices, the company has now ordered a second identical machine worth in excess of £380,000.

Sales director Ian Petitt says: "The original order delivered two years ago was won on our turnkey project engineering capability against other European machine suppliers. Now, in order to meet rapidly increasing demands for its range of devices, plus the high utilisation and reliability achieved in the deep hole drilling process, we were very quickly shortlisted for the second follow-on order.

"Once commissioned, reliability has been very high and we have had no warranty claims registered against the first Mollart HDI-1500 BTA machine."

The machine is producing a series of blind and through holes between 20 mm and 47 mm diameter in pre-heat treated, solid stainless steel bar where holes can be up to 1,200 mm deep. Geometric tolerances are within 0.2 mm for straightness, 0.05 mm TIR for concentricity and 0.025 mm for roundness with surface finish within 0.8 micro-metres Ra.

The 22 kW HDI-1500 BTA machine has a capacity from 18 mm to 50 mm diameter by 1,500 mm hole depth with the high performance BTA process tending to be used in preference to gundrilling on larger diameters and heavier duty applications. The process involves high flow rates of filtered coolant being pumped under pressure between the wall of a pressure drill tube and drill bushing to lubricate the drill head. Once in the cutting zone, the empowered coolant flushes and evacuates the chips back through the centre of the drill tube back into the reservoir.

The Mollart Engineering group of companies has recently been awarded the AS9100 Aerospace Industry Standard.

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# Cutting fluid recycling pays off for aerospace specialist

The relatively high volume of metal cutting performed by Senior Weston Aerospace at its Earby, Lancashire facility created an issue around cutting fluid waste disposal, both from an environmental and cost point of view. Working with Environmental Technologies it arrived at a very favourable solution.

The relocation of the business to new, purpose built facilities provided the opportunity to address the traditional fluid disposal method. Previous methods simply allowed cutting fluids to be drained from large swarf skips and containers into underground tanks for storage then the waste fluid was subsequently disposed of by pumping out and having taken away for treatment and disposal by various specialist suppliers. This practice proved to be not only expensive but also not in keeping with current requirements to reduce environmental waste and certainly did not make any contribution to BS14001 accreditation

Senior Weston Aerospace invested in a purpose-built system to both better handle the processing of swarf but importantly to significantly reduce the volume of waste cutting fluid. The system developed by Senior Aerospace and Brighouse-based Cromar provided an effective solution to lift and tip the swarf from a standardised container into a receptacle, draining coolant as it does this, then subsequently compacting the swarf into small briquettes. This briquetting reduced the volume of the swarf by 90 per cent and removes 97 percent of any residual coolant in the swarf.

"This had several benefits for us," says Luke Butler, who is overseeing the project for Senior Weston Aerospace. "Firstly it meant that our waste contractor had to make fewer collections, and these could be undertaken by smaller vehicles with lower carbon emissions and hence a positive impact on the environment."

**CARDEV recycling and mixing stations make a significant impact**

With an increased amount of waste coolant now being created the company turned to Knaresborough-based Environmental Technologies for advice on how best to deal with it. The solution was to recycle rather than disposal. Environmental Technologies had already supplied a CARDEV automated coolant mixing system to the new facility at Earby, and it was a relatively straightforward procedure to install a CARDEV CCS500-B coolant cleaning station into the system. The waste coolant from the briquetting machine now undergoes a complete cleaning and rejuvenation process involving, filtering, through a bag-type filter, and tramp oil removal, before being processed through the CCS500-B unit. The unit itself then passes the waste coolant over an Ozone generator that revitalises the coolant and kills off any harmful bacteria and the agitation releases any remaining tramp oil. This coolant is now sent to a holding tank, via another set of polypropylene filters where it is held ready to be used again by the CARDEV mixing station.

The system is designed to use recycled coolant first and the factory is equipped with a pipe network that delivers coolant at a precise strength to individual machines, eliminating the time consuming and potentially hazardous need for an operator, or labourer, to transport coolant from a central location to a machine tool. By using the recycled coolant the volume of neat emulsion used by Senior Weston Aerospace has reduced dramatically.

"We are recovering and recycling in excess of 10,000 litres of coolant per week, which in turn is reducing our consumption of concentrate by 500 litres a week, which is a significant cost saving. When added to the financial benefits of reduced labour costs and efficiencies gained by more effective swarf handling we have fully justified the investment we have made in the CARDEV recycling system and briquetting process," says Luke Butler.

The system at Senior Weston Aerospace is supporting 50 large CNC machine tools manufacturing components for aircraft structures, interiors and engines for a wide range of aircraft including each of the Airbus A320 family, A330, A350 and A380 platforms. This requires a high degree of consistency and control of the manufacturing process. The performance of the CARDEV CCS500-B and the automated mixing station ensure that there is no inconsistency in the performance and mix strength of the coolant being used. The elimination of any manual input ensures that coolant is mixed accurately and with the system using its own stored water supply any drop in mains water pressure is also compensated for.

**CARDEV coolant equipment achieves four month payback**

After a very successful experience of CARDEV coolant handling equipment in the UK, Senior Aerospace have made a second investment in CARDEV, this time for their new facility in Thailand. In the first four months of operation the equipment has generated savings that more than cover the entire capital cost of the equipment, inclusive of delivery and installation.

James Byrom, MD of Environmental Technologies Ltd (CARDEV equipment

manufacturer) says: "It is an honour to be asked to work directly with Senior Aerospace on their latest factory in Thailand; the second Senior site for which we have supplied CARDEV coolant handling and recycling equipment. We know we can offer amazing savings to our customers whilst delivering operational and environmental benefits, but it is always pleasing when the client is able to see this

first hand. This confidence often then spurs our customers on to take the next step, or to spread the initiative to other sites in the group. Indeed, we are already working with Senior Aerospace to commission equipment at other locations."

The Thailand site uses a CARDEV SmartMix to ensure accurate mixing of the metalworking fluids; tight, accurate and repeatable emulsions giving the fluid the best possible start. By reclaiming used metalworking fluid from a swarf-briquetting process, the CARDEV CCS (Coolant Cleaning System) has allowed Senior to reclaim over 20,000 litres of coolant per month, equating to a saving of around 2000 litres (10 barrels) of neat soluble product per month. Capable of recovering up to 3000 litres per day, the CARDEV CCS removes large particles from used coolant, followed by three further stages: tramp oil removal, air/ozone infusion (to control bacterial growth) and finally fine particle filtration, before returning the coolant for re-use.

The CARDEV SmartMix and CCS link together, controlling the concentration of the recycled coolant and ensuring that fresh coolant is only supplied to the workshop when there is not sufficient recycled coolant available.

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# Aerospace and pharmaceutical manufacturer continues to expand in Ireland

TEG, which has been producing parts for the world's leading aircrafts since 2001, has progressed in recent years from a subcontract machining firm to become a multinational engineering services provider exporting to 35 countries, including China.

With headquarters in Mullingar, Co Westmeath, the company was one of the first manufacturers in Ireland to be certified by the European Aviation Safety Agency to make interior parts for passenger-carrying aircraft built by Airbus, Boeing and other primes. It later gained EASA Part 21(G) approval to manufacture structural parts from metallic and non-metallic materials.

The company, which is certified to the AS9100C quality standard for the aviation, space, and defence industries, is also heavily involved in supplying AOG (aircraft on ground), MRO (maintenance repair overhaul) and legacy components. Aer Lingus, BE Aerospace, Iceland Air, BAE Systems, Bombardier and Lufthansa Technik are regular customers.

Another specialism is building automated manufacturing lines and tooling for the biopharmaceutical and pharmaceutical sectors. Products include the latest NG range of tablet feeders, blister pack tooling, pharmaceutical packaging design, tablet and booklet feeding systems, bespoke wash racks for sterile fill parts and format change parts for solid dose blister packing. Customers are blue chip names within the industry, such as GSK, Johnson & Johnson, Merck, Eli Lilly and Pfizer.

TEG, which also holds ISO 9001:2008 approval, provides tailor made solutions and is invariably asked to produce relatively small quantities of parts and assemblies, often involving reverse engineering, 3D printing and non-destructive testing.

Between 5- and 30-off is usual for aircraft cabin components, for example, and orders are rarely for more than 100-off. AOG, MRO and legacy parts are normally one-offs.

On the pharmaceutic side, machinery parts are required in low numbers, while blister pack tooling in aluminium or stainless steel and the associated hardened steel cutting and perforating tools are made in ones and twos.

When the company started investing in CNC machining centres, bearing in mind the relatively low volumes of production, importance was placed on speed of programming on the shop floor to minimise setup times and maintain productivity. Hurco's proprietary single-screen Max and twin-screen Ultimax (now WinMax) controls were considered ahead of other conversational CNC systems on the market.


TEG's founder Tommy Kelly was already familiar with the supplier's equipment, having used Hurco machining centres and lathes when he held senior manufacturing positions in previous companies. It brought him familiarity with the novel control technology as well as into contact with the sales representative in Ireland for Hurco Europe, Michael Gannon Machine Tools, through which the machines are supplied.

John Hunt, joint owner and managing director of TEG comments: "Virtually since the start, Hurco machine tools have been the backbone of our company's growth and success.

"Our bespoke service, rapid turnaround times and competitive prices can only be fulfilled if the spindles on our shop floor are running for a high proportion of the time.

"Hurco machines ensure that this happens. A majority of our components are programmed conversationally in WinMax at the controls on the shop floor and are into production very quickly."

In the case of smaller, less complicated parts, the machines can be cutting metal in a matter of minutes. For more complex components, entire cutting cycles or the more difficult elements within them are prepared off-line in one of TEG's CAM systems and the program is downloaded to the controls.

Over the years, numerous Hurco 3-axis and 4-axis prismatic machining centres have been installed at the Mullingar factory, together with the manufacturer's CNC turning equipment. TEG has a policy of regularly replacing its shop floor plant and early machining centres have already been superseded by three of Hurco's latest i-series models, which arrived in early 2015.

Another of TEG's commitments is to training and further education. At any one time, 20 staff are undergoing a four-year apprenticeship under the Irish government's SOLAS scheme. In addition, employees are kept up to date with the latest techniques in CAD, CAM, CNC machining, surface treatments and assembly.

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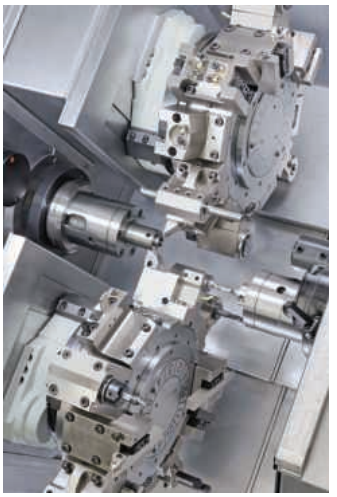
# Italian-built lathe combines compactness with versatility

A new, CNC turn-mill centre called Quattro B436Y2, with two Y-axis tool turrets and two opposed C-axis spindles, has been introduced by the Italian firm, Biglia, whose sole sales and service agent for the UK and Ireland is Whitehouse Machine Tools. Quattro lathes have been produced since 1990 and are now in their third generation. They are especially well suited to machining of tough alloys due to their sturdiness and high power.

The 36 mm bar capacity automatic lathe has a compact structure and occupies less than five square metres of factory space. The machine exhibits exceptional vibration damping and thermal stability due to robust construction of the 45-degree cast iron bed, linear rails, 12-station turrets with live tools (4.6 kW / 22 Nm / 6,000 rpm) and 11 kW / 7,000 rpm motor-spindles. The result is high productivity and dimensional accuracy of machined components as well as good surface finish and long tool life.

The CNC counter spindle has two degrees of freedom, in the Z-axis as well as the X-axis, allowing it to be offset by 170 mm from the centreline of the main spindle, eliminating interference between the turrets when simultaneously machining at both spindles. It also allows an unusual arrangement where a tailstock can be advanced in the space vacated by the offset counter spindle to enable turn-milling between centres using the main spindle and simultaneous reverse-end machining by the counter spindle and second turret.

The CNC is a RISC 64 bit Mitsubishi M700 with 10.4" colour display and alphanumeric keyboard. Proprietary software gives very high surface finishes by minimising jerk, as well as nano interpolation and look-ahead path estimation for high speed, accurate control of the drives.



A host of standard additions aids flexibility of operation and productivity, such as load detection on all axes, part-present check on the sub-spindle, a programmable automatic parts catcher and a finished parts conveyor. Options include high pressure (up to 30 bar) coolant delivery, simultaneous cutter offset measurement at both turrets for rapid tool setting, and tool wear and breakage monitoring.

At the start of 2016, the first B436Y2 lathe in the UK will be delivered as a turnkey solution to a leading precision subcontractor on the south coast of England, where it will join an existing Biglia B465-T3Y triple-turret machine with three Y axes.

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# Supporting diversification in engineering

As with any industry, the engineering supply chain takes many kinds of business to operate smoothly. Manufacturers, wholesalers, distributors and vendors are all crucial elements of a bigger picture so when a company changes its role, it can be a massive gamble.

Shropshire-based fasteners distributor GWR Fasteners recently expanded its offering, which had previously relied on pure distribution, to also include manufacture of difficult-to-source components. With the help of sliding head lathe specialists Star GB, the forward-thinking engineers dove headlong into a full production setup.

GWR had already found its niche as commercial director Jude Robinson explains: "Because we have online selling channels, we can produce products where we've identified gaps in the market, so we can put them on our shelves for sale. So it could be the BA (British Association) range, it could be aluminium spacers, stainless spacers and all of these are made on the Stars."

GWR Fasteners took delivery of its first

sliding head lathe, a Star SB-20R Type G, in September 2014 and set to work manufacturing its own products. It immediately saw a surge in demand, and before long orders had increased by a staggering 3,000 percent, prompting the installation of a second identical machine in June 2015. Since then, they haven't looked back.

Managing director Gary Robinson says: "We wanted something that would give us the versatility to setup and run small quantities in a production environment, so that we could then produce large quantities.

"The fact that you could run them overnight, lights-out, means lean production times. We can run unmanned a lot of the time, so that obviously means we can be more competitive."

But it's not all about the machines. GWR have a long-standing partnership with Star that pre-dates its move into manufacturing. With Star's support, GWR has made a great leap into a new area of industry and achieved impressive levels of success in its first years.

Mark Anson, sales manager at Star concludes: "We're very proud of the difference we've made to GWR Fasteners. We're fortunate enough to have a hand in a lot of success stories, but this one is particularly unusual. It's not every day that companies make such drastic changes to how they operate, and we're delighted to have been a part of that process."

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# Fully automatic deep hole drilling

## TBT loading system allows unmanned shifts

Along with other precision machined components, GLUMANN Maschinenbau in Chemnitz, Germany specialises in producing long rotating shaft type parts. Deep hole drilling plays an important role the production of these items and so, in order to keep up with the growing volume demands from an engineering customer, the contract manufacturer decided to equip its new deep hole drilling machine from TBT with a fully automatic loading system and Dettingen/Erms-based TBT developed the ideal solution.

Deep hole drilling is an important technology for any contract manufacturer that processes shaft type parts within its portfolio. Many shafts require relief holes or have to be supplied with lubricant. That's why GLUMANN Maschinenbau has seven deep hole drilling machines in operation, including two from TBT for hole depths up to 2000 mm.

The larger machine, an up-to-date ML500, is mainly used to work on various configurations of shaft for a long-standing engineering customer. The diameter of the holes in these shafts can vary, up to 80 mm. BTA/STS deep hole drilling method is the technology used. In this method, the cutting oil is fed to the tool under pressure along the outside of a hollow drill tube. The drill head itself, which is mounted onto the end of this tube has hard metal (carbide) cutting plates or inserts and has openings directly behind the cutting plates which allow cuttings and cooling lubricant to exit out of the hole through the inside of the drill tube and then into a chip conveyor.

Gerhard Glumann, chairman of the board and production director looks back: "As the quantity of shafts to be processed on this machine kept increasing, we had to come with a new solution to stop us getting into delivery deadline issues". We opted for a fully automatic loading system, so that the machine could be operated unmanned once all processing parameters have been set. We presented this plan to our machine manufacturer TBT, who then worked upon a solution for us."

Developing systems which facilitate fully automatic operation of deep hole drilling machines is part of everyday life for the experts in Dettingen/Erms and many solutions are available as standard. In this case, TBT designed a unit precisely tailored to meet the requirements and conditions at GLUMANN.

**Components on two levels**

"After inspecting the space situation at the end-user, our designers came up with the idea to arrange the components in a space-saving layout over two levels, raw parts above, and finished parts below. Each level has a conveyor chain system to bring the parts in and out", explains Karl Heinz Napowanez, sales director at TBT. "On the upper level, approximately at the height of the machine spindle, there is room for around 20 raw parts. That's roughly the amount which is usually processed during a shift. The length of the shaft catered for, can be adjusted from 500 to 2000 mm, which means it can used for a very wide range of component lengths," he adds.

Above the component conveyor chain, a two-armed gantry grab moves backwards and forwards on rails. As for the working process itself: The grab collects the raw part

from the upper level, goes to the drilling spindle and puts the part into a self-centring steady rest between the three-jaw chuck and a female cone, then returns to the waiting position. The three-jaw chuck clamps automatically, and the drilling process can start. After drilling, the shaft is released and the grab lifts the part again from its processing position and passes it on to the lower level. One important detail, the grab has also been designed by TBT to be flexible. It covers the whole range of diameters which GLUMANN needs for its customers, from 80 to 140 mm, and so does not have to be converted.

**Integrated into control**

"One thing was very important for us," emphasises Gerhard Glumann, "the positioning of the loading unit behind the machine. This is different to many other automated solutions in machining technology and was necessary so that we can easily process individual one of orders for example, without any difficulty by bypassing the fully automatic loading operation. This means the ML500 is accessible from the operating side like any standard machine, with no access restrictions.

The loading system is fully integrated into the machine control system. The operator only enters key data such as length of part to be processed, drilling diameter and depth. This means the machine "knows" the part in question and can run the NC program. TBT has built in even more features: total tool life,

which the tool is expected to achieve, can be set via two different workpiece counters, which trigger different reactions in the program execution. This means the machine stops for a change of cutter in good time before tool failure. The ML500 also has feed force and coolant pressure monitoring. If the wear and tear on a tool should exceed a certain level more quickly, or if any other problem arises, the machine will also shut down automatically.

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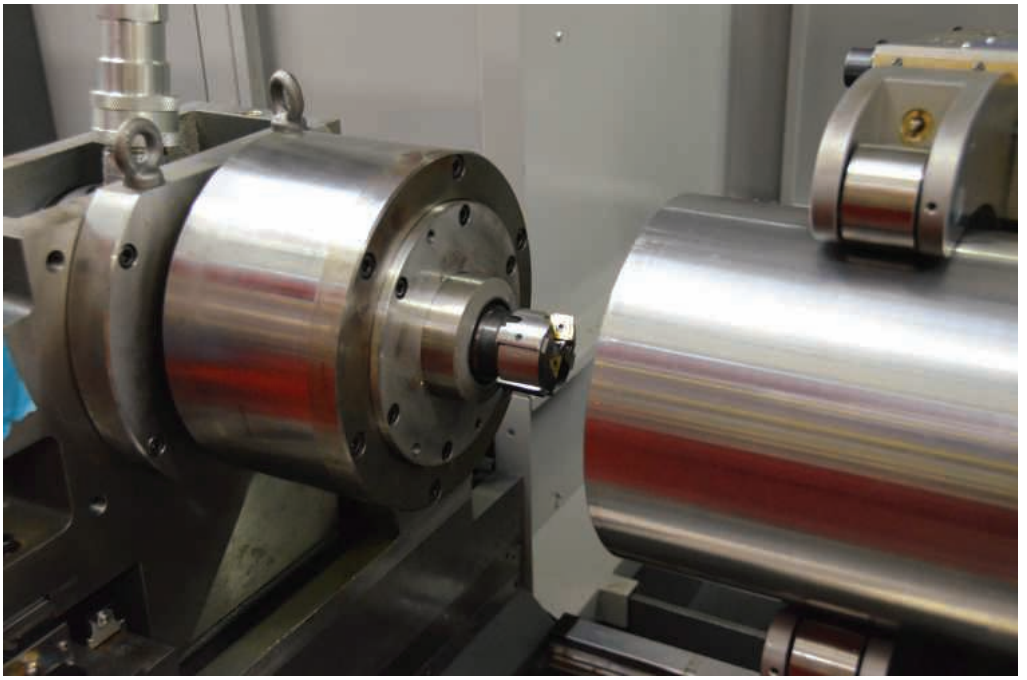
# Power, rigidity and steerability hole boring capability



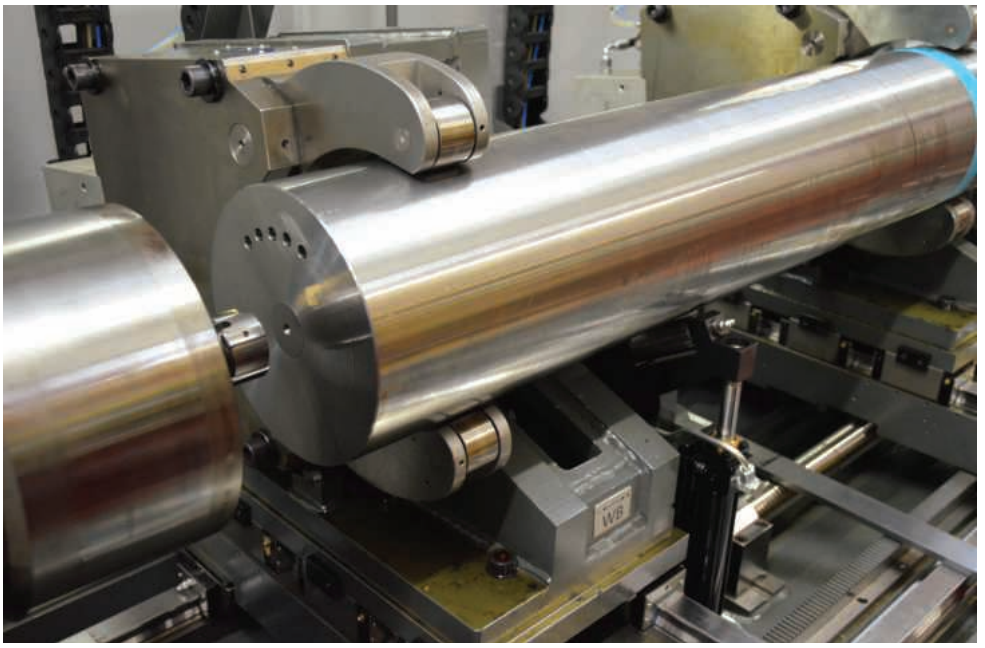
Mollart Acubore drill head and 63.5 mm drill

First production trials on Mollart Engineering's pioneering development of the Acubore deep hole drilling centre at its Chessington subcontract facility, have proven its ability in creating a drill direction factor to maintain the straightness of a 63.5 mm diameter bore in an oil industry component while also demonstrating a cycle time saving of 2.5 hours for the hole. This operational saving, against a previous four hour drilling cycle on the Super Duplex material, has been achieved, largely due to a combination of the power available and rigidity of build.

The 7-axis Acubore, developed at a cost of more than £550,000, is able to track the actual path of the drill point relative to the outside profile of the component as it penetrates the material using non-destructive high speed laser ultrasonic technology (LUT). LUT then feeds the captured data through specially developed algorithms that are integrated within Acubore's Fanuc 31i control system. As a result, a straightness correction factor can be applied through the machine's X-axis independent steady support arrangement for the component in conjunction with its C-axis rotation.

The oil industry destined parts are produced out of 250 mm diameter by 2,180 mm long, 13 percent chromium Super Duplex stainless steel bar and each component weighs some 900 kg.

The change in method to produce the component's central through bore on Acubore still involves Mollart creating the initial machining datum and removing any inbuilt stress from the material by turning the outside diameter and skimming both faces to ensure they are square and parallel. The part is then loaded to the company's 5-axis Centeplex, a hybrid combination milling and gundrilling centre, to produce a series of five, blind angle holes of 7.7 mm diameter set on a pitch circle diameter and drilled to a depth of 330 mm from the end face. Once completed the component is then transported to Acubore for production of the main 63.5 mm diameter through bore.



Mollart's Acubore deep hole drilling centre about to penetrate the Super Duplex oil and gas component

As the Centeplex was designed as a specialist machine to combine conventional milling and drilling with deep hole drilling cycles as a single cycle, it has the advantage of an inclined axis to tilt the conventional main and (mounted over/under shotgun style) gundrilling spindle at up to +/-15, deg. This enabled the machine, prior to Acubore's commissioning, to not only drill from solid the 63.5 mm diameter main bore, but also include in the cycle, the production of the five 7.7 mm diameter pitch circle holes in the end face. While these deep blind holes are inclined at 5 deg towards the component outside diameter they have a specific tolerance so the bottom must be no closer than 10 mm to the outside diameter of the material.

Due to the 2,180 mm overall length of the material, using the insert-based Botek BTA drill head, the 63.5 mm main bore is drilled from solid, to its halfway position. The material is then indexed around, relocated and the datum set to align and drill the main bore to break through. This complete cycle for the main bore took some four hours to complete on Centeplex.

While still using the tilting spindle configuration of Centeplex to effectively produce the five pitch circle gundrilled holes, the component is now located in the two X-axis independently programmable three point steadies of Acubore and held in the C-axis rotational chuck spindle. This is mounted in what would be a tailstock position of a machine for the main bore to be processed.

The drill head of Acubore was developed for power drilling with a 30 kW motor able to create up to 666 Nm of torque with a top speed of 5,000 revs/min. This enabled the machine to accommodate smaller hole sizes as well as freer machining material types. Set to run at 450 revs/min on the Super Duplex material with a feed rate of 80 mm/min, the coolant pressure head, which is carried alongside the BTA Type 07 'chip-forward' drill head, has a rate of flow of 190 lit/min. This ensures that the broken chips are removed effectively away from the drill head to pass back through the inner core of the single drill tube in order to prevent any build-up and to keep the cutting zone cool.

Similar to Centeplex, Acubore only drills half-way through the component before it is turned around and very simply relocated in the three jaw chuck with support of the steadies ready to be drilled to breakthrough with the original bore. Here, the use of LUT ensured the hole drilled from solid at each end is straight and accurately aligned. However unlike the Centeplex cycle which took four hours, as Acubore has the greater power, torque and rigidity with the added advantage of LUT correction, it is able to complete the 2,180 mm deep hole in perfect alignment in just 1.5 hours which includes handling.

Following an initial start of the drill for the Acubore process into the solid bar material, the BTA drill head is drawn back into its guide bush and the W-axis that provides the steady support of the component along its length is also retracted. This enables the creation of enough space to check both the bore and tool before initiating the full drilling cycle.

Once the cycle commences, the LUT system approaches the component and collects the first reference point from the centre line of the drill hole. The C-axis indexes and the laser then collects two further datum points, one above and one below centre line.

The LUT system remotely generates non-contact high frequency pulses of ultra-sound that propagates into the material which then returns to the material surface where a receiver transmits the captured data to the control to enable any displacement to be automatically calculated.

When correction is required, in conjunction with the machine's phased rotation of the C-axis, any calculated data is fed directly to the appropriate X-axis of one, or both, of the two independent 3-point roller steadies which are located on the bed of the machine.

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# New release includes technical information and essential application guidelines

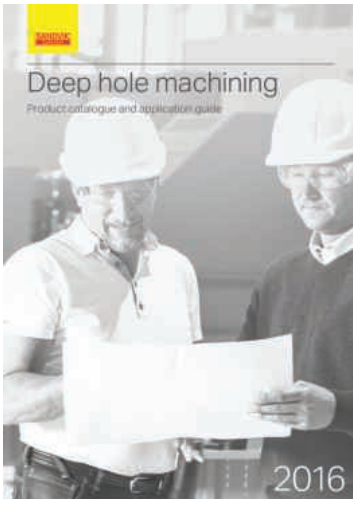
Deep hole machining is the preferred method for drilling hole depths up to 150 times the hole diameter. Sandvik Coromant's updated catalogue and application guide provides manufacturers with technical information, best practices and a full tooling assortment for single tube systems (STS), ejector systems, and gun drill systems.

Regardless of the deep hole machining method used, the basic principles of drilling apply and manufacturers depend on Sandvik Coromant for the most comprehensive and up-to-date technical information. The Deep Hole Machining catalogue is a starting point for all applications and provides tips and guidance, machine tool setup and troubleshooting information. Tool and product data in this catalogue follows the ISO 13399 international standard to simplify the exchange of tool data.

Included in this catalogue are drill heads (CoroDrill 808, 800 and 801), counterboring heads (CoroDrill 818 and Tmax 424.31) and gun drills (CoroDrill 428) with reference information such as technical features, hole depths and tolerances and hole diameter ranges. It also includes combined skiving rollerburnishing tools and drill tubes for STS and ejector drills, accessories and spare parts.

Raimo Annanolli, global application specialist for Deep Hole Machining says: "The application guide is an essential reference that provides a wealth of information to customers. This resource explains drilling systems, methods and machinery, machining and coolant recommendations, cutting feeds and speeds and much more."

Available in 14 languages, the comprehensive Application Guide and Catalogue includes ordering codes and a material code reference list. It is available in print in with a hard cover to withstand tough shop conditions or can be accessed online in Publications, Sandvik Coromant's digital




library. The online version is continuously updated, can be downloaded and shared through email and has search functionality across all Sandvik Coromant catalogues and brochures.

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# Thame is set to grip the crowds

As a leading specialist in the design, manufacture and supply of innovative workholding and automation products, Thame Workholding is promising a host of exciting new innovations for visitors to the forthcoming MACH 2016 exhibition.

For manufacturers with mill/turn centres, Thame will be launching the new HWR Inoflex 4-jaw concentric and self centring chuck with a through-bore. This exciting new chuck enables the clamping of round, rectangular and geometrical irregular shaped parts. With the addition of a through-bore, the new power chuck is available in sizes from 212 to 315 mm with a through bore up to 91 mm diameter. Despite offering a clamping force of up to 145 kN, the sensitivity of the HWR Inoflex makes it ideal for clamping parts that are sensitive to deformation whilst providing a concentricity precision of 20 microns. The diversity of the Inoflex range from Thame is truly remarkable.

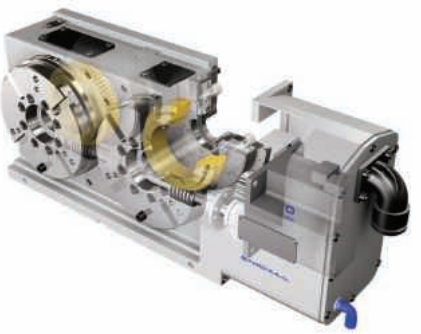
The Long Crendon-based company will be offering chucks with the option of manual or power operation and also with or without a through bore. At MACH, the experts from Thame will be keen to demonstrate the benefits and application diversity of the new Inoflex as well as the company's comprehensive range of Samchully hydraulic and manual chucks. With chucks available as closed centre, standard bore, large bore and mega bore options that are available in two, three or four-jaw configurations, Thame will have something for everyone at MACH.


Returning to MACH, due to its repeat success at the event, will be the Lang ECO-Tower 60. The popular Eco-Tower 60 is a compact system with a small footprint that can deliver automation to any machining centre. At the show, Thame will be running a promotional offer that will make this system too good to miss. With a low purchase and operation cost and a functionality that makes the Eco-Tower very easy to use, it's no surprise this Lang system attracts the crowds.


The ECO-Tower enables the customer to select manual or automated production; and with just two G-Codes required to communicate between the tower and the machine tool, the ECO-Tower 60 is the epitome of user friendly flexible automation. The tower can accept either 45 or 60 pallets, each with a maximum capacity of 30 kg and a generous dimensional limit of 350 by 200 by 200 mm. Furthermore, with pallets configured to the Lang zero point system, precision, repeatability and reduced setup times are just a few of the benefits. With a wide variety of flexible automation systems available from Thame, visitors to MACH that are keen to make their first foray into automated production, should make the Thame stand their first port of call at the show.


For machine shops aiming to maximise the capabilities of their machining centres, Thame Workholding will be introducing the new Samchully line of 4th and 5th axis rotary tables. Extremely precise, fast, rigid and also offering exceptional clamping forces, the new line-up can be configured to virtually all machining centres to offer cost effective 4th and 5th axis capability. Available with a range of options, the 4th axis variations include a standard rotary table, a large bore NC, a hydraulic rotary table or a multi-spindle table. The 5th axis variants offer a tilting NC rotary table, a multi-spindle tilting rotary table and also a rear mounted motor NC rotary table.

Last but not least Thame will display an extensive range of its UK produced TEC Chuck Jaws in standard and special format and its own Powerpull Bar Puller and Trueborer. With extensive workholding and automation systems on show plus experts that can discuss your specific needs, please visit the Thame Engineering **Stand 5251** at MACH 2016 to find out more.



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# Quick-change jaw to optimise productivity

During reorganisation of its soft machining department, Stieber GmbH in Heidelberg systematically examined its processes with the goal of increasing productivity, flexibility and eliminating unnecessary waiting and setup times. The SCHUNK Pronto jaw quick-change system turned out to be particularly efficient in delivering results for this customer.

German based Stieber GmbH is a world leader in the production of freewheels and escapement mechanisms. As part of the Altra Industrial Motion Group, a worldwide leading manufacturer of mechanical drive elements, Stieber is focused on delivering quality with maximum customer satisfaction. In pursuit of this goal, the focus is equally on processes, systems, materials and employees. The main motivating forces are Kaizen and the continuous improvement process.

**Higher flexibility and lower costs**

During a Kaizen event with the Altra group management at Stieber in Heidelberg, Andreas Sandmaier, who is responsible for production control, transformed the conventionally organised soft machining department into a cell production system. The aim was for workpieces to pass through all stations without lengthy waiting times. Andreas Sandmaier explains: "Instead of receiving prepared blanks for sawing, our machining now starts with sawing of the pre-machined part and ends shortly afterward with the completed part"

The result is that processing times are reduced by two to three weeks. Short-term orders can be produced with much higher flexibility.

The team recognised early on that the setup times on two lathes slowed the process considerably. Andreas Sandmaier continues: "There are days when the early shift has to change the setup six times. That takes between 15 and 20 minutes each time"

If covers are machined in quantities between five and twelve, the number of setup processes is even higher. The first step was to equip all existing jaws with bolts and T-nuts, to allow faster changing.

**One hour of setup time saved per day**

The SCHUNK Pronto quick-change jaw system finally provided the solution. The first test resulted in significant savings potentials. The standard system was further optimised in cooperation with Schunk. Today the team needs only two to five minutes to change from one product to another. Due to the parts spectrum, usually only the clamping attachments have to be changed, which takes only a few minutes. The savings in setup times for each lathe now add up to over one hour per day, according to Andreas Sandmaier: "The system increases the productivity on our existing lathes by 10 to 15 percent, without the necessity for extensive investments. With one small step we have made huge progress."

The SCHUNK Pronto was developed for conventional lathe chucks with bolt-on jaws. It reduces the absolute setup time for a complete jaw set to only 30 seconds, which is about 95 percent less than with conventional solutions. It combines serrated supporting jaws (1/16'' x 90° or 1.5 mm x 60°) with special quick-change inserts that allow expansion of the clamping diameter within seconds by up to 55 mm on soft jaws and by up to 45 mm on claw jaws, without having to move the base jaw. That is eight times more than with conventional power chucks.

For fast jaw changeovers with repeat accuracy, the operator only has to loosen the interchangeable insert with an Allen key, remove the insert and replace it with another one. This eliminates the risk of incorrect positioning. In a locked state, six-sided form-fit clamping ensures maximum process stability and enables high force and torque transfer. Different supporting jaw variants are available for small, medium, and large clamping areas, depending on the particular application.

**Complete line of quick-change jaws**

The quick-change jaw system can be retrofitted on chucks sizes 200, 250 and 315, regardless of the manufacturer. A specially developed setup cart provides for orderly storage and fast accessibility of all claw inserts, soft interchangeable inserts, supporting jaws with mounted bolts and T-nuts as well as the adjusting sleeves. A clearly structured table book enables fast selection and mounting of the single components.

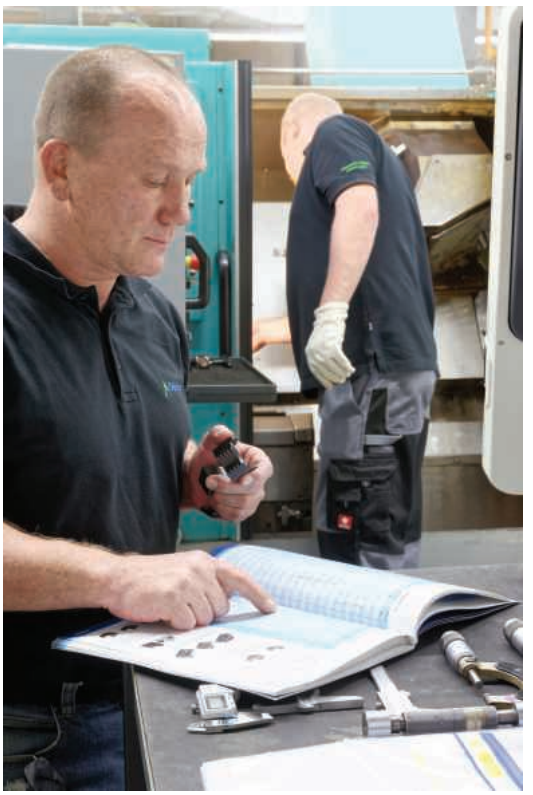
The SCHUNK Pronto is especially

advantageous when it is necessary to increase the productivity of existing lathes. Andreas Sandmaier concludes "Instead of replacing our existing lathe chucks with quick-change chucks, I would much rather invest in the quick-change jaw system. That is much more economical. Pronto fits our philosophy exactly: Fast, simple, short distances with everything in its place. It is the final touch in our strive for short setup times."

SCHUNK Intec UK has been operating in the UK market as a wholly owned subsidiary since 1998. Customers now benefit from prompt and reliable advice, assistance and support. Area managers are regionally based and are available at short notice to visit customers to help find solutions to their manufacturing problems, as well as to make recommendations on product choice.

The comprehensive UK stockholding ensures optimum availability and rapid "next working day" turnaround of popular products. Furthermore customers can receive "all from one source", therefore saving time and money. The company do not however consider themselves as just a distributor of components, but as a partner for the solving of problems and the supply of comprehensive solutions. Quality, support, service and especially reliability are held in the highest regard.

STIEBER GmbH, a company of the ALTRA Industrial Motion Group, was established in 1937 and today is a mid-sized company with 140 employees at locations in Heidelberg and Garching near Munich. The company's core competence is the design and production of drive elements for mechanical engineering. A special strength is the development and production of freewheels and escapement mechanisms, which transfer torque by means of frictional contact. In addition to the standard components, numerous special solutions have been created over the years, such as housing freewheels with pumpless internal circulating oil lubrication, disengaging escapement mechanisms with load compensation, and more than 3,000 special designs that were developed for individual applications.



**SCHUNK Intec Ltd Tel: 01908 611127 Email: info@gb.schunk.com www.gb.schunk.com**

# SPANNTOP Nova always delivers the best performance

The innovative Hainbuch SPANNTOP Nova workholding system now provides three different chuck options, the combi pull-back with end stop facility, the combi dead-length with end stop and the modular chuck pull back version for bar work only. All equipped with different features, this exciting range has been developed to meet all your clamping requirements.

Resistant against contamination from coolant, swarf and dust, the clamping head of the SPANNTOP Nova has a vulcanised seals that protect the system from any ingress from the work area. This vulcanised clamping head on the SPANNTOP Nova also minimises vibration to improve precision, surface finishes and the consequent tool life for the end user.

The rigid clamping of large workpieces in the chuck is no problem for the SPANNTOP Nova. Customers can just fit the jaw module and clamp parts up to 215 mm diameter. Internal clamping is just as easy. By rapidly changing over to the mandrel system that fits directly into the Nova chuck, this tiresome process is significantly reduced. By utilising Hainbuch's CentroteX positioning technology, no radial adjustment is necessary. This enables the customer to retain precision and clamping forces whilst drastically reducing changeover times. The changeover time is further reduced with just three screws holding the base end-stop. This innovative feature allows customers to change from bar work to billet work in just over a minute!

Furthermore, the SPANNTOP Nova has a particularly large contact area between the collet and chuck taper. This delivers exceptionally accurate clamping and also minimal component deformation when clamping parts with short lengths.

For 60 years Hainbuch has been constantly developing new clamping solutions focusing on customer requirements, delivering all that customers expect from clamping solutions: setup times and cost savings, flexibility, productivity, energy efficiency and security.

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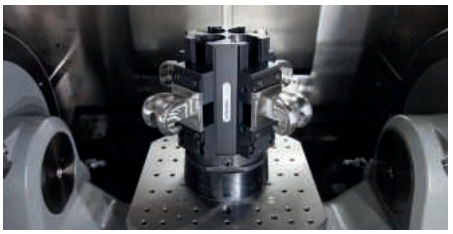
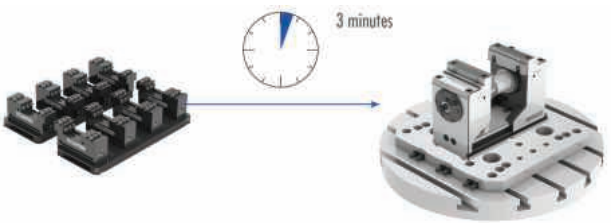
# Increase machine utilisation with improved workholding setups

WNT's workholding systems are proving to be highly productive by allowing greatly reduced setup times and maximising the machine tool's capacity through use of its MNG Zero Point base plates.

A typical changeover from one setup to another can be achieved in under three minutes using the MNG Zero Point base plates, which would equate to a saving of 10 hours per week when compared to a conventional workholding setup time, or 480 hours per year. These significant time savings are further enhanced by the productivity savings that can be generated by the versatility of the WNT workholding system.

The MNG Zero Point base plates form the foundation of the workholding system and come in a variety of sizes including base plates with one, two, three, four, six, and ten location points. The plates themselves are only 30 mm deep so have very little impact on the axis travel of the machine tool. To these base plates can be added single or multiple vices, as well as tombstone-style fixtures. For the latter the setup time using a WNT ESG mini 4V clamping column, equipped with four ESG mini single vices including workpieces is in the order of two minutes.






One of the key advantages of being able to have multiple vices or fixtures attached to the MNG Zero Point system is the ability to run for extended periods unmanned. Furthermore, when the workpieces have been machined, replenishing the vices is also quick and easy as, for example, the WNT ESG mini-40 vice features permanent workpiece datums via its fixed jaw location and the vice, as with others in the range, is also completely encapsulated, meaning there is no swarf ingress to interfere with the changeover.

Several key features of the MNG Zero Point base plate system mark them out from their competitors, these include no requirement for power (hydraulic or air), zero maintenance costs, no peripheral equipment required to operate them, freely selectable positioning of vices and vices can be centrally mounted without the need for an intermediate plate.

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# Chucks provide high repeatability and long life in honing applications

Honing machines are usually delivered with rudimentary or no equipment for clamping workpieces, as machine builders do not know what types of component their customers will be producing. Oleo International, which makes hydraulic buffers for the rail industry as well as for lifts and industrial use, has therefore fitted Kitagawa manual scroll chucks to its honing machines to retain cylindrical components securely, accurately and without damage. These were supplied by UK agent, 1st Machine Tool Accessories (1st MTA).

Stan Ross, senior production engineer at Oleo's Coventry factory says: "We use power chucks on our lathes for maximum holding power, as they are rotating and rough turning can generate a lot of torque. However, lower cost manual chucks are adequate for workholding when honing, as they remain static and the machining process does not impart much force.

"Nevertheless they need to be of good quality, as we need a high degree of repeatability and minimal distortion when clamping our cylinders and plungers.

**Image 1 and 2: A Kitagawa JN12T manual scroll chuck clamping an Oleo type 4 rail buffer cylinder for machining on a Delapena vertical PowerHone**

**An Oleo Type 70 industrial buffer cylinder secured for horizontal honing on a Sunnen CNC machine. The chain clamp at one end, which is supplied with the machine, would be insufficient to hold the part firmly enough, hence the use of a Kitagawa JN12T manual scroll chuck at the far end**

In addition, the chucks need to withstand a lot of wear and tear from honing paste and fine metal particles, especially on vertical honers, so durability is important to ensure long service life."

With these prerequisites in mind, he selected Japanese-made Kitagawa 3-jaw, self-centring scroll chucks for use on all four of Oleo's honing machines. Two are Delapena semi-automatic, vertically-stroking PowerHones and the others are Sunnen horizontally-acting CNC tube honers. It means that jaws can be swapped between the machines for maximum production versatility.

Two-piece jaws are used, comprising a steel base to which a suite of 10 sets of pre-machined aluminium jaws are secured using cross tenon mounting and two bolts per jaw. The base is secured using a new cross guide system that minimises run-out. Teeth on the underside engage with a scroll plate, located inside the steel chuck body, as it is rotated to tighten and release the workpiece. The aluminium tops are machined to suit different sizes of plunger and cylinder and some are wrap-around to increase the holding force. This precaution is sometimes necessary, as higher torque is imparted when machining larger diameters and honing oil has a tendency to cause a clamped component to slip.

Stan Ross concludes: "We have dealt with the Kitagawa agent, 1st MTA for a decade and always find them professional in their approach and technically knowledgeable. They recommend the best product for an application, even though it might cost less than others in their range.

"Another thing we liked was their willingness to fly in a chuck from Japan at no extra cost when we bought the last two, as they only had one of the model we wanted in stock."

Kitagawa manufactures a large variety of 2-, 3-, 4- and 6-jaw manual chucks up to 457 mm (18 inches) in diameter. The scroll chuck models in use at Oleo are of 310 mm diameter, designated JN12T, with 10-300 mm external and 90-290 mm internal clamping ranges and 55 kN maximum gripping force.

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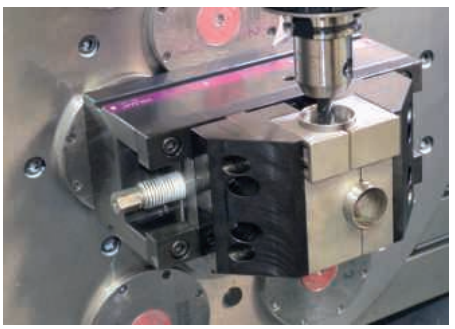
# Roemheld shows off solutions

Cutting edge solutions and new products will be on display on the Roemheld **Stand 5022** at MACH. The stand will be split into technology zones for 5-axis clamping, zero point mounting, automation and materials handling systems.

Visitors will be able to see Roemheld's new range of 5-axis vices designed for manual application but with the clamping force to withstand the heaviest metal removal operations. Ideal for use with exotic materials such as titanium, these 5-axis components bring cost savings on raw materials as the jaw design enables gripping on just 3 mm.



Within each technology zone, the latest product ranges will be on show, including new components that will be launched at the show. The latest innovations will also be demonstrated. Visitors to the stand will therefore be able to see examples of how Roemheld offers leading workholding solutions right across different manufacturing processes and applications.

Roemheld will also be exhibiting the latest lifting and handling elements available in the UK. An automotive fixture, designed for the assembly and build of car doors will be on display. This offers the capability to lift, tilt and turn on a single fixture for versatile and ergonomic handling. Height adjustment is also available to suit the needs of individual operators.

Terry O'Neill, managing director of Roemheld (UK), says: "Because we offer such a wide range of cutting edge workholding solutions, we decided that splitting the stand into zones would make it easier for visitors to find what they were looking for. Roemheld is a world leader in workholding and handling technology and

we are excited to be launching an innovative range of new group products into the UK at MACH. These, as with our existing product ranges, are all designed to deliver cost savings, production gains and increased profitability."

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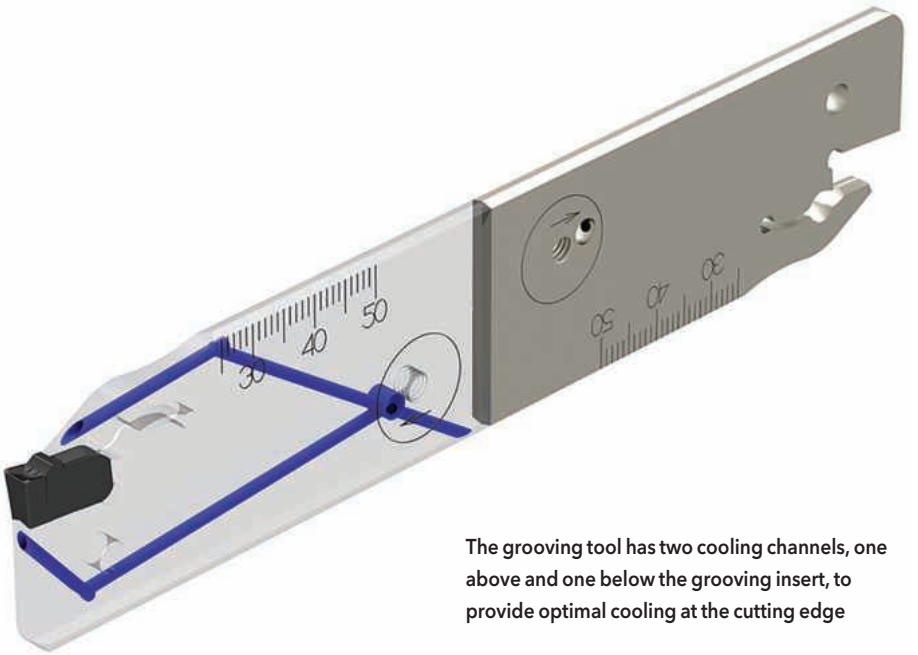
# Precise and to the point coolant delivery

The process of grooving and parting difficult materials exposes the edges of the parting blades to high mechanical and thermal strain, therefore effective cooling is absolutely necessary. By developing its already proven and universally applicable SX grooving tools with dual internal cooling channels, WNT with its Direct Cooling (DC) system has overcome the issue, ensuring optimal working temperatures as well as ideal chip removal and unprecedented process reliability.

WNT's single-edged SX grooving system is well-suited for grooving, parting and for copy turning operations for steels and always ensures good chip control. Now, with the addition of internal coolant channels in the blade, the system offers an enhanced cooling solution. The two cooling channels, one above and one below the grooving insert, provide optimal cooling at the cutting edge, enabling significantly higher cutting speeds. Additionally, as the coolant jet hits directly where the chips are formed, ideal chip evacuation can also be achieved. The system is effective, even in deep grooves with the chips easily evacuated by the coolant, avoiding potential damage to the insert. The internal coolant also improves results by reducing the crater wear and build-up at the cutting edge.

**The DirectCooling System delivers optimum working temperature as well as ideal chip evacuation which together ensures the highest level of reliability**




**The grooving tool has two cooling channels, one above and one below the grooving insert, to provide optimal cooling at the cutting edge**

The DC-SX grooving system from WNT has clear advantages, when compared directly with competitor systems with internal cooling as its design creates a continuous high flow rate even at low operating pressures, with flow rates of 3.84 litres/min achieved at a pressure of 10 bar, compared to 2.76 litres/min from competitor systems. This significantly higher flow rate from the WNT DC-SX system ensures a constant ideal working temperature, extended tool life and increased process security. WNT also dedicated design resources to the sealing screw for the DC-SX grooving system. This screw seals the transfer hole on the outside of the blade and is manufactured from steel with a Torx head making it easier to change and preventing breakage and thread stripping. The assembly is now also simplified, with the copper ring being glued to the screw, eliminating multiple small parts as found in other systems.

Toolholders are available for the DC-SX parting blades with a special transfer point ensuring coolant delivery for the full adjustable range of the parting blade. In addition WNT has extended the existing VDI parting blade holder program for disc turrets and also introduced VDI blades for star turrets, to offer the possibility of internal coolant supply. Block parting blade holders are also available upon request for the DC-SX grooving system. The holders are also compatible with all parting blades that do not have internal coolant supply.

"The DC-SX grooving system from WNT continues our tradition of innovation and further extends our standard catalogue range that includes over 45,000 articles. The benefits of DC-SX mean that it is a must for companies that have a requirement for grooving and parting off as the DirectCooling system can be used on almost every lathe," says Tony Pennington, managing director, WNT (UK)

As with the full range of WNT products the DC-SX system can be ordered either by phone or via the WNT online shop. And, as always, if the article is ordered by 6:30 pm it will arrive the next day.

WNT (UK) Ltd, based in Sheffield, is a sales organisation supplying precision cutting tools to the metalcutting industry.

Through optimal service and an unbeatable product quality WNT is the ideal purchasing solution for metalcutting.

The WNT Group is successfully represented internationally in 18 countries and has its headquarters in Germany. It is part of an international group of companies with more than 5,300 employees worldwide.

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**www.wnt.com**

# Versatile milling in focus

When working with mixed production, investing in a versatile milling cutter is always a good idea. CoroMill® 390, equipped with size 07 inserts, is an extremely flexible concept designed for productive milling in a wide range of operations and materials. Thanks to the small inserts, a higher cutter-teeth density delivers superior productivity. Combine with the insert grade GC1130, produced with Zertivo™ technology, for an added dimension of security and predictability to your steel milling operation.

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# Unilathe on the railroad to success with TaeguTec

The prolonged depression in the oil & gas sector is impacting business for subcontractors the length and breadth of the UK. However, Unilathe is a subcontract manufacturer that sees the downturn as a small 'bump in the road' credit to its diversification strategy and more importantly its £3 million machine tool investment over the last four years.

The investment in two heavy duty mill/turn centres from Mazak and WFL have been complemented by vertical turning centres from Honor Seiki and Doosan. This has improved flexibility, productivity and reduced setups to improve overall through-flow. For Unilathe, this investment has enabled the company to ride the cost-down demands of the oil & gas supply chain whilst improving the productivity and lead-times on its large components for the aerospace, hydraulics, rail and general engineering sectors.

The business has increased capacity by over 20 percent with its machine investment, whilst productivity has also soared. However, like any established subcontractor, Unilathe realises that machine tools are only one factor in the overall picture of a business. To this end, the AS: 9100 accredited company has employed the expertise of TaeguTec to maximise the productivity of its machine tools.

Unilathe's manufacturing director, Mark Oakley says: "Our work is extremely diverse with regard to material type, part size and machining process, so we use a wide variety of cutting tools from TaeguTec to support our needs. We've worked with TaeguTec for over 15 years and this longstanding relationship is based on excellent support and continuous product innovation that sees a TaeguTec engineer frequently visit with new products to continually improve our productivity and processes."

A glowing reference to this endorsement was the market introduction of TaeguTec's Chase2Hepta face milling cutter in 2013. TaeguTec's technical sales engineer, John Handley introduced the Chase2Hepta to a troublesome job and the consequent success now sees the Chase2Hepta designated as the face mill of choice for Unilathe's heavy stock removal demands.

Like many subcontractors producing one-off's and small batches, quantifying benefits can often be difficult. However, Unilathe won a contract to produce 150 large carbon steel forged 'mud valves' for the oil & gas sector that instantly started to wear and break inserts on an alternate face-mill. The unacceptable performance of this competitor cutter gave the Chase2Hepta an opportunity to shine.

Running on a Toyoda horizontal machining centre with a BT50 spindle, the 100 mm diameter Chase2Hepta with seven insert pockets and double sided inserts offered a 15 percent reduction in cost-per-insert compared to its predecessor. But we all know it's about performance and not cost!

To this end, the new Chase2Hepta increased cutting speed from 190 to 220 m/min and the spindle speed from 620 to 700 rpm. To coincide with these parameters, TaeguTec increased the feed rate from 800 mm/min to 1500 mm/min whilst retaining the same 3 mm depth of cut as the previous tool. The result was a cutting time reduction of 45 percent from 26 to 14 minutes for each of the four flange faces on the mud valve. This recorded a metal removal rate of 309 $cm^3$/min compared to the previous 167 $cm^3$/min. Overall, the insert cost saving of £270 and the productivity improvement that impacts the chargeable rate of the machine tool, delivered a total financial saving of £1800 or 43 percent for this one batch of parts.

Whilst the financial benefit, tool life and productivity improvement were instantly realised the Chase2Hepta delivered even more. The XNMU right hand helical cutting edge insert with a sharp positive chip-former in the TT9080 grade also improved surface finish, chip flow and reduced the vibration and forces on the machine spindle.

Following the successful implementation of the Chase2Hepta that was proven on the mud valves in 2013, the TaeguTec face mill is now the rough machining cutter of choice for the £7.5 m turnover business.

The remarkable success of the Chase2Hepta at Unilathe has been paralleled with the implementation of other TaeguTec tools such as the ChaseMold and ChaseBall. The combined success of these tools has contributed to Unilathe reducing its average monthly tooling consumption from £35,000 to £25,000.

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**www.taegutec.com**

# ONESOLUTION

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**Finishing Range Definition:**
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F=0.05-0.3mm/rev

### M3P

**Medium Range Definition:**
Ap=0.5-6mm
F=0.15-0.6mm/rev

### R3P

**Roughing Range Definition:**
Ap=4-12mm
F=0.4-1.2mm/rev

M Stainless Steel

### F3M

**Finishing Range Definition:**
Ap=0.3-3mm
F=0.05-0.3mm/rev

### M3M

**Medium Range Definition:**
Ap=0.5-6mm
F=0.15-0.6mm/rev

### R3M

**Roughing Range Definition:**
Ap=6-11mm
F=0.15-0.75mm/rev

# Machining Intelligently

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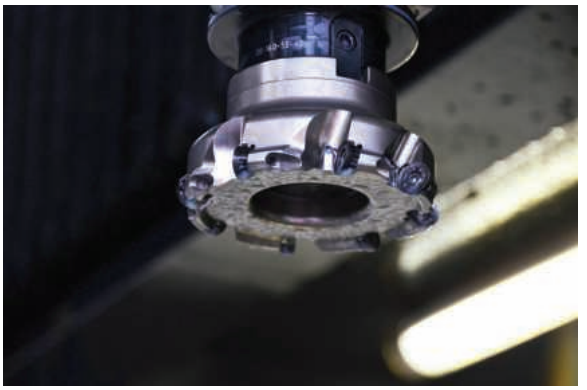
# Consumable milling costs slashed

It was a timely release in the UK by Sumitomo Electric Hardmetal of its revolutionary Wave Radius Mill RSX Series, developed specifically for machining exotic alloys, that enabled the precision machining operation of Special Machined Products (SMP) to reduce its consumable milling costs on a long-standing contract by a massive 44 percent in the first stage machining qualification operation on Inconel 718 forged blanks.

Mark Easter, general manager of the family-owned, Sheffield-based Special Steel Group (SSG) company maintains: "Not only have we slashed consumable costs with the new face mill cutters and inserts, we have also totally improved machining conditions with added predictability, better swarf control and have been able to increase machining parameters. We have also reduced the average number of passes from 60, over the six faces of the raw forged material, to just 45 and even reduced cycle times by up to 15 percent."

Chris Briggs, area sales engineer of SMP's long-serving tooling distributor Matrix Tooling Services, adds: "We were approached by SMP to look at improving the overall productivity of first stage machining of the nominally sized 257 mm by 214 mm by 136 mm rough Inconel forgings down to 250 mm by 208 mm by 130 mm. However, even with SMP having to machine between 60 and 70 of these blocks a month, we could initially only confirm that the setup on the T.W. Ward CNC Machinery supplied Hartford Blockbuster PRO-3150AG vertical machining centre was highly suitable for these parts."

He maintained, the rigidity of the machine was ideal with its hardened and ground box ways that gave high stability as a milling platform and the power and torque from the 26 kW motor and two-speed gearbox was more than sufficient for the application setup. With regard to the tooling, Chris Briggs could see little room for improvement so called in Sumitomo's area sales engineer, Trevor Hague, to give his opinion.



Trevor Hague originally agreed with Matrix Tooling's assessment: "My first impression was that no matter which tooling supplier was brought in, improvement to the setup, cutting data and cost reductions would be very marginal at best."

However, within weeks, Sumitomo had released its latest RSX Wave Radius Mill Series of high rake angle face milling cutters with the newly developed ACM insert grades for machining alloy and stainless steels. This new combination of highly rigid cutter body and insert provided very low cutting resistance (soft entry) which minimises the onset of vibration while the insert's physical vapour deposition (PVD) coating significantly encourages increased performance and gains in cutting life.

Over the following two weeks at SMP, Sumitomo performed the first ever cutting trials of the new cutter and inserts at a UK customer site and chalked up an immediate success.

Immediately, swarf control improved into curly pigtails and while the previous supplier's inserts had 16 edges, the change to Sumitomo's eight-edge design improved overall tool life and even significantly reduced insert costs per edge.

Further in the trials, Trevor Hague then increased the cutting speed to 35.3 m/min for the 125 mm diameter RSX face mill, improving the feed rate by 35 percent to 108 m/min, which led to the average number of finished parts per insert being raised from 1.3 to 1.42.

The RSX Series of cutter bodies have a high rake angle and feature a totally new development to enable precise positioning of the button insert in the cutter body. By having a highly durable thickened support behind the insert with an 'R'–shaped pocket feature, swarf control is significantly improved. This special location of the insert combines a series of formed tangs that confirm a precise and highly stable mounting position with the insert positively locked against a conical clamping face.

Mark Easter concludes: "With the success of the Sumitomo RSX face milling cutter and ACM inserts, combined with the rigidity of the Hartford machine, we have established the ideal base for quoting very confidently and competitively for additional work on similar very difficult materials."

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# Softening the issue of hard machining

Nickel-based heat resistant alloys such as Inconel 718 are regarded as formidable opponents for the cutting tool industry. However, the composition of these materials sees them soften when heated to temperatures beyond 800° C, making them easier to machine. To efficiently carve through these difficult to cut materials, Mitsubishi Materials has now developed its innovative new line of ceramic end mills, the CESRB Series.

Whereas cemented carbide end mills deteriorate drastically when working beyond 800° C, the new range of ceramic end mills retains their strength. This enables them to conduct high speed machining with large depths of cut and at high feed rates on difficult to cut materials such as Inconel. Capable of working at parameters beyond that of carbide end mills, ceramic end mills can double tool life whilst machining at feeds and speeds up to 10 times higher than conventional tools.

The concept behind this new range is that it should run without coolant at high speeds and feeds with relatively heavy depths of cut to generate higher frictional heat. By generating an increase in temperature, the component material softens and enables the end mill to work more efficiently. As such, the Mitsubishi R&D department suggests that these new end mills operate at speeds from 13,000 to 26,000 rpm depending upon tool diameter with feed rates in the region of 1.5 to 2 m/min.

**Ceramic end mills with extreme heat generation**

Ideal for Inconel applications in the aerospace and power generation sectors, the performance of the new CESRB range is credit to its ceramic composition and the innovative geometry. The creative geometry design incorporates an optimised helix angle that reduces cutting forces and prevents the 'pull-out' effect that is common during heavy machining. Furthermore, Mitsubishi has utilised its seamless grinding technology to deliver a higher edge chipping resistance, even during extreme roughing applications. These features are supported by a strong negative flute and specially developed rake edge that withstands high temperatures and loads.

Further enhancing the performance characteristics are the fact that they are available with a four-flute designation for pocketing and slotting operations, whilst a six-flute design is available for face and profile machining. The four and six fluted end mills are available in diameters of 6, 8, 10 and 12 mm with a corner radius of 0.5, 1 and 1.5 mm depending upon the chosen diameter. The respective diameters are provided with a 6, 8, 10 and 12 mm shank. To maximise rigidity and performance, the ceramic CESRB series has a stub length design with an overall length of 50, 60, 65 and 70 mm and a cut length of 4.5, 6, 7.5 and 9 mm for the selected diameters.


Due to the high performance characteristics of this new ceramic range, Mitsubishi recommends that customers utilise a robust machine tool with a sturdy tool clamping configuration such as a precision hydraulic chuck.

**MMC Hardmetal UK Ltd Tel: 01827 312312**
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# Don't compromise on tooling

Quickgrind has issued a warning to the British engineering industry that many businesses are unconsciously hindering their own performance by compromising on its choice of tools.

Ross Howell, Quickgrind's managing director says: "As engineers, it's very obvious to us that a bespoke tool, specifically designed for a particular application, will perform better in that situation than a general purpose item bought from a catalogue.

"When it comes to round-shank carbide tooling, a tailored solution is unquestionably the best option if a company is looking to enhance its tool performance, its productivity, its competitiveness and its reputation for great quality and delivery."

So why would anyone choose to compromise by buying standard tools instead? Ross Howell explains: "There are several common reasons. I think we are all guilty of making compromises in our daily purchasing decisions, without really considering the consequences. How many of us have chosen the cheaper washing-up liquid, only to find we need to use twice as much of it? Beware false economy. For some, it's a case of being too busy to look into what advantages today's bespoke tooling has to offer, or even to think about tools at all. For others it's a belief that the established practice of buying from catalogues must be right, as it's what their company has always done. Then there is the incorrect assumption that use of standard tools is more economical."

Keen to dispel the myth that bespoke tooling is an expensive luxury, Ross Howell says: "Our state-of-the-art technology has made the manufacture of tailor-made tools much more cost-effective, so there really isn't a huge difference in purchase price now. More importantly, bespoke tooling is about saving money on processes, increasing productivity and making a bigger profit. Standard tools have hidden costs, like frequent machine stoppages and resetting, rapid tool wear and slower cycle times, as well as unnecessarily complicated tool inventories."

To maximise the benefit gained from bespoke tooling, Ross Howell urges businesses to contact Quickgrind for advice: "The quality of our products is renowned on a global scale but we also offer the flexibility and responsiveness of a British tooling manufacturer who truly understands your issues. Our tooling consultancy service can find ways of making your processes more effective and competitive, and we can bring further economies through advances such as our unique tool remanufacturing process and tool management systems.

Quickgrind is an internationally renowned carbide cutting tool manufacturer whose unique approach and innovations make customer processes quicker, more convenient and more profitable.

The company has gained an international reputation for these solutions, which are exported worldwide to customers using mould and die and aluminium extrusion in sectors including Formula One, aerospace, automotive and general engineering.

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**www.quickgrind.com**

# New interchangeable head tooling line for CNC lathes

Floyd Automatic has now extended its cutting tool line with the arrival of the W&F Micro range of interchangeable tools. The new tooling system from Floyd Automatic Tooling has a completely interchangeable head design that provides a versatile, quick change solution that retains precision to 0.002 mm.

The new W&F Micro Series utilises 'Face & Taper' contact technology to guarantee precision repeatability of 0.002 mm whilst giving the end user a remarkably fast tool change, which is ideal for pre-set tooling systems. The tool holder of the W&F Micro range remains in the machine whilst the head can be rapidly removed with a single screw that enables the operator to change inserts outside the machine if desired. For more spacious machine tool work envelopes, the inserts can be changed quickly with a single screw that requires no further adjustments.

With a single screw that locates the interchangeable head in the tool holder, the W&F Micro system has an innovative design that delivers the highest possible stiffness,

rigidity and precision. This is guaranteed by a patented cylindrical stabiliser design that permits precise insert changes with speed and confidence.

The interchangeable heads are available with a wide variety of head types that can be specified for general turning, facing, profiling, parting and also internal profiling and boring operations. Furthermore, the head designs are available in left and right hand formats with through coolant available upon request. The diverse design of the compact heads, makes them suitable for all types of turning application whether it's on a Swiss type machine, a multi-spindle or even a general turning centre. The toolholders are available with an 8 by 8 mm, 12 by 12 mm or a 16 by 16 mm square shank with an overall length of 80 mm. These compact toolholders are robust and rigid, which enhances tool life and surface finishes for the end user whilst making them suitable for use on all machine tool types.

The arrival of the W&F Micro turning line satisfies the desire of end users to achieve a completely flexible and interchangeable system that can reduce tooling inventory and the associated costs whilst maximising the potential of tool positions in machine tools with limited capacity.

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# The new standard in drilling

The Tritan-Drill, the three-fluted drill from MAPAL, achieves more bores, a longer tool life and lower machining costs compared with its twin-fluted companion. The Tritan-Drill makes it possible to machine with a significantly higher feed rate. In both standard and special designs, it combines process reliability and high performance. It is a universal drill for a wide range of materials and provides rounder bores and reduced burr formation. These results are achieved thanks in part to the innovative geometry that gives rise to optimum chip removal and a low cutting pressure. The Tritan-Drill is also convincing for long-chipping workpiece materials due to its special chip formation.

In difficult drilling situations such as cross bores or inclined bore entrance, the Tritan-Drill has proved to be effective.

Significantly more bores, remarkably 45 percent, when compared with a twin-fluted drill, are possible when machining a cylinder head made of GJL 250. Previously a twin-fluted step drill was used for machining the 15 and 16 mm diameters. 1,800 bores were machined with a cutting speed of 100 m/min and a feed rate of 0.2 mm/rev. With the three-fluted Tritan step drill not only can the cutting speed and feed rate be increased to 130 m/min and 0.34 mm/rev, the tool life of the drill is also significantly longer with 2,600 bores.

Another example of the versatile range of applications of the Tritan-Drill is the machining of a VA-rail. This part that is exposed to strong mechanical loads at high temperatures is manufactured from heat-resistant steel with an austenitic structure. The alloy ensures a high strength at operating temperatures up to 1050 °C and prevents embrittlement but is difficult to machine. The Tritan-Drill is also suitable for this challenge. Compared with a twin-fluted step drill that has a tool life of 48 metres, corresponding to 3,200 bores, the Tritan-Drill achieves a tool life of 63 metres, or 4,200 bores. And all of this at a high feed rate.

The reliable machining of a turbocharger made of heat-resistant cast steel is another successful application of the Tritan-Drill. Previously with a twin-fluted drill with a 8.3 mm diameter, a maximum of 60 parts could be machined. The Tritan-Drill manages 140 parts. This means that productivity is 130 percent higher.

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**www.mapal.com**

# VISI 2016 R1

Significant developments in CAD, Mould and CAM functionality are included in VISI 2016 R1, from Vero Software. The product naming convention also explains the move to a new 6 month release cycle with two versions planned per year.

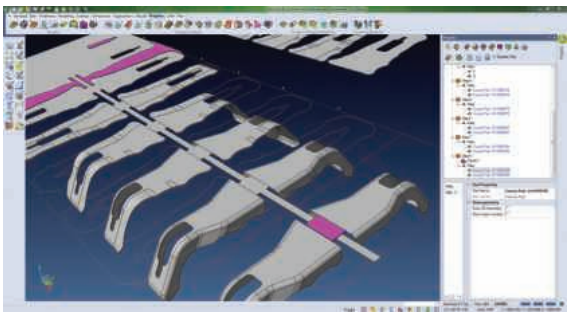
As a leading developer and provider of CAD/CAM/CAE solutions, Vero Software say VISI 2016 R1 is a substantial release introducing many new features in all areas of the product with continued emphasis on solutions for mould, tool and die makers.

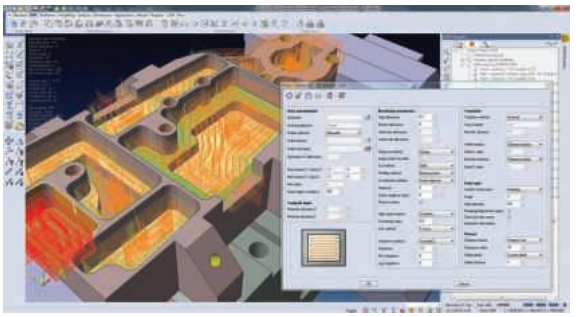
Major graphic enhancements include an updated GUI with quick access toolbars, live icon combinations on the mouse, improved hidden line removal and geometry selection by 'free-shape' brush. In addition, CAD translators have been updated to support the latest 3rd party CAD formats including Inventor 2016, layer categories for NX and attribute hole mapping for Catia V5.

User efficiency continues to be a focus for product development and major CAD developments include significant picking and sketching enhancements, associativity improvements for 3D dimensions, a redesigned part revision manager, and multiple plotview updates.

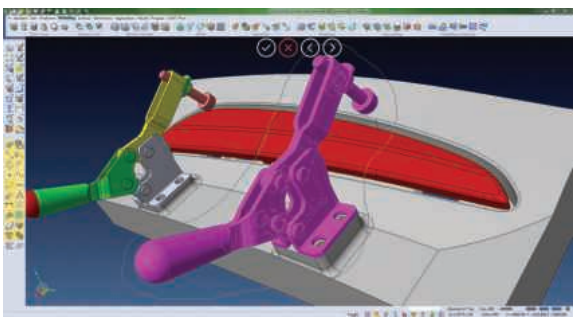
VISI Mould developments include improved cooling channel management with support for solid groups, CAD transformations and updated catalogue components such as plugs, connectors and baffles. Additional enhancements include a new tool to produce lubrication grooves and a rewritten database tool to manage and edit the 3D standard element libraries.

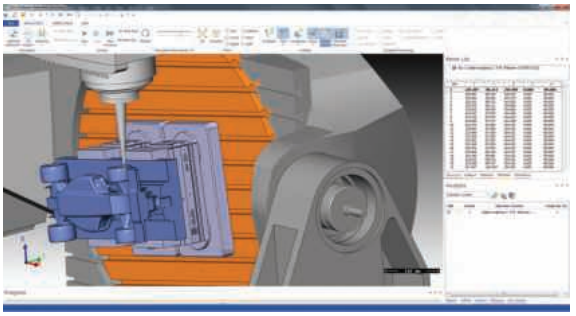
For those involved in sheet metal stamping, VISI Progress updates include improvements to the part replacement for 3D strip design, the ability to manage multiple strip designs within the same project, and the option for defining families of punches as instances; allowing for automatic updates of geometry if the parent punch is modified.





VISI 2016 R1 represents another release with major CAM developments covering 2D, 3D, multi-axis, and wire EDM updates. 2D enhancements include significant speed improvements (especially on complex patterns), a final clearance milling path for zig-zag toolpaths and improved linking for pocketing operations. For 3D machining operations, the user interface has been simplified to help define the geometry piece, stock and additional faces. An updated CAM engine provides better memory management and improved performance allowing VISI to run multithreads for a single toolpath calculation. This means that a single toolpath build can be split into parallel calculations, significantly reducing the total build time (this is managed automatically by the CAM engine). Wire EDM developments include 64Bit engine support, improved 4-axis offset support, and feature recognition for constant tapered apertures.





Other CAM developments include improved analytic material removal, updated stock/model comparison, and a new 'toolpath enquirer' tool to allow the operator to analyse the underlying toolpath data and search for geometry such as elements shorter than a given length or vertical arcs.

Headquartered in England, Vero Software designs, develops, and supplies CAD/CAM/CAE software radically enhancing the efficiency of design and manufacturing processes, providing its customers with exceptional value through high productivity gains and significantly reducing time to market. The company's world-renowned brands include Alphacam, Cabinet Vision, Edgecam, Machining STRATEGIST, PEPS, Radan, SMIRT, SURFCAM, WorkNC and VISI, along with the production control MRP system Javelin. Despite the diversity of application, these solutions have one thing in common: they all address the rising challenges of achieving manufacturing efficiencies and bring huge value to the operations in which they are deployed.

Vero has direct offices in the UK, Germany, Italy, France, Japan, USA, Brazil, Netherlands, China, South Korea, Spain and India supplying products to more than 45 countries through its wholly owned subsidiaries and reseller network.

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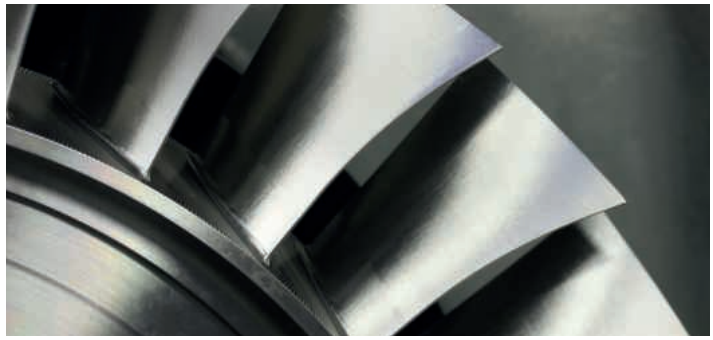

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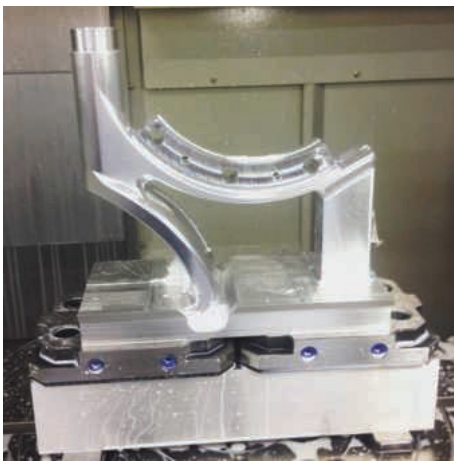
AUTODESK.

# hyperMILL 'the only option' for mountain bike manufacture

As a fifth generation engineer, Stewart Palmer knew from a young age the path his career would take. As a child, Stewart was always more interested in dissecting his bike and finding out how it worked, rather than riding it. Now, as a highly skilled engineer, Stewart has spent the last 18 months designing and manufacturing his own downhill mountain bike.

Stewart's engineering pedigree has been earned as a programmer and machinist of F1 components and high performance engines. However, the dream of designing his own product didn't arise until he joined North Bucks Machining Ltd (NBM), the family owned company started by Stewart's parents in 2011. As the brainchild of Stewart's father Dave Palmer, NBM was started when Dave was made redundant from his machining position at a blow mould outfit producing plastic packaging products. Dave and his wife started with a HAAS machining centre and eventually brought in their son Stewart and daughter Jo-Anne, to take NBM to the next level.

Reflecting back on the early days of the business, Stewart Palmer says: "The business rapidly became successful in the 3-axis machining arena but a contract to design and manufacture eight mould tools for 5-litre Jerry Cans, meant we had to invest in technology. I previously worked at a prestigious company producing 5-axis F1 parts, so my ambition was always to evolve into the 5-axis market. This arrived in the guise of a Quasar 5-axis machining centre from the Engineering Technology Group (ETG) and high-end CAM software from OPEN MIND Technologies. I had a great relationship with ETG; and from previously working with an F1 component manufacturer, I knew hyperMILL from OPEN MIND was the only option with regards to CAM software."



"High-end CAM software can be an expensive outlay for a small business with just 6 staff and a few HAAS 3-axis machining centres, but if you can comprehend the potential benefits, its a no-brainer. My family took some convincing, but the penny dropped when we had to produce a knife blade for a box-folding company. Using our previous CAM system was a struggle that made this relatively easy re-modelling task a 2 hour job. I convinced the family of the benefits of OPEN MIND's hyperMILL and as soon as we bought it, I modelled the next knife tool in just 10 minutes. Everyone was immediately convinced."

**Why build a bike?**

Stewart's background in designing and producing complex parts soon gave the biking enthusiast the idea of designing his very own bike. In his spare time, Stewart created numerous drafts of his first bike design. He eventually took the concept to Laser Scanning, a design agency that developed a 3D CAD model from Stewart's sketches. From this 3D CAD model, comprehensive Finite Element Analysis (FEA) was conducted to put shocks, loads and particular stresses on the frame design. Once the 3-piece frame design passed the simulated stress testing, NBM set about machining its first bike. The aim of the design was to improve the strength and structural integrity of a mountain bike. As Stewart says: "Standard bikes are produced from hollow tubes that are fabricated together. This design automatically has weak points on every weld seam. To reduce weight, we realised we couldn't machine hollow tubes, so we used solid aluminium billets and i-beam technology to scallop out the sides of the frame to reduce mass. We calculated that we could machine our rib thicknesses down to 5 mm whilst retaining structural integrity."

**A bike was born**

The bike design consists of three core features, the main frame, the seat post and the swing arm that connects the main frame to the rear wheel and suspension. To emphasise the level of machining required, the main frame is machined from a 100 kg aluminium billet down to a 4.5 kg frame. The seat post starts as a 15 kg billet and ends as a 250 g part and the swing arm is machined from a 50 kg billet down to a 2 kg part. This leaves an aluminium frame of less than 7 kg from an overall billet weight of 165 kg. This may appear a costly and time consuming method of production, but NBM investigated waterjet cutting and the time and cost element was similar. The aim was to prove the concept and manufacture the best possible product.

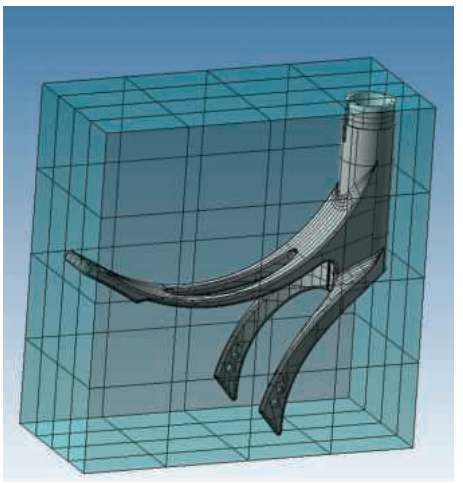
Using OPEN MIND's hyperMILL, the frame is machined in 40 hours, the swing arm in 18 hours and the seat post in 15 hours. However, with just two frames produced to date, time is not the key issue for NBM. As Stewart Palmer continues: "At this early stage, the machining time is not the key issue, it's the surface finishes. Once this frame is machined, it has no secondary hand finishing, it's ready for final assembly or shipping. It's all about delivering an aesthetically perfect bike to the customer."

**Taking productivity to the MAXX**

Whilst surface finish is more critical than cycle times, Stewart is aiming to reduce the machining time by implementing OPEN MIND's new hyperMILL MAXX machining package for rough machining. Marketed by OPEN MIND as the next generation in CAM software for cutting hours from machining cycles, NBM has run an early simulation of hyperMILL MAXX and found the cycle time reduction to be extremely positive. Just one of the roughing cycles on the main frame has been reduced from 2 hours 20 minutes to less than 1 hour 30 minutes, a 40 percent reduction. It is estimated that if the part was run on a machine with a spindle speed in the region of 15 to 18,000 rpm, as opposed to the existing 8,000 rpm, the cycle time is projected to fall close to 30 minutes, a massive 80 percent reduction on the existing run-time.

**Bikes for sale**

As a project in its infancy, Stewart has ambitions of further enhancing the design of the frame to reduce the overall weight from 6.75 kg to approximately 5 kg. As an engineer with a pedigree in F1 design & production, getting the frame to shed a few grams as it progresses, will be second nature. At present, if you are a mountain biking enthusiast, you can contact North Bucks Machining Limited in the heart of the UK motorsport valley Milton Keynes to get more details. The company will look to retail the 3 part frame and rear suspension unit in the region of £7000 or a completely built bike with a top specification at approximately £10,000.



If you want to take a closer look at this engineering marvel, OPEN MIND Technologies will have the complete bike available on its stand at MACH 2016.

**Open Mind Technologies**
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**Email: adrian.smith@openmind-tech.com**
**www.openmind-tech.com**

# Hockley Pattern increases its power

An investment in a new Mazak machining centre convinced Neil and Gareth Williams, joint managing directors of Halesowen-based Hockley Pattern, that the time had come to move up to Delcam's PowerMILL CAM software for 5-axis and high-speed machining.

One of the UK's leading toolmakers for the aerospace and automotive industries, Hockley Pattern specialises in turnkey tooling packages for the production of composite components, together with all the associated jigs and fixtures for trimming, drilling, checking, assembling and bonding those parts. The company boasts an impressive list of clients in both sectors, having supplied the likes of Airbus, Bombardier, Rolls Royce, Spirit Aerostructures, Triumph Structures, GE Aviation, GKN, Bentley, BMW and Jaguar Land Rover.

The company was founded by Neil and Gareth's father in 1979 and is now jointly managed by the two brothers. Since moving to its current site in Halesowen six years ago, it has doubled its turnover, increased its workforce to 53 people and now has the strongest order book since it started trading.

The brothers decided to invest in a Mazak VTC 800 5-axis machining centre to expand the company's existing machining capacity, in particular to accommodate a large tooling order from Airbus. They believed the machine would be ideally suited to the production of the large, complex tooling required in a variety of different materials by the aerospace industry. However, he was less confident in the capabilities of the company's CAM system.

Neil Williams says: "We were making a significant investment in a machine that had the potential to process difficult-to-machine materials, much more quickly and to exceptionally high tolerances. There didn't seem to be much point in making that investment without a CAM system that could help us take full advantage of the machine's capabilities. We had been thinking about switching to Delcam software for some time and the new five-axis machine meant it was definitely time to make the change.

"Our aim is always to keep on improving and developing our manufacturing procedures to ensure that we can support all of our customers' needs. Even during the last recession, we kept on investing in new equipment. This not only ensures that we stay competitive, it also means that we can continue to deliver the highest quality tooling."

As CNC manager, Darren Laker was responsible for supervising the transition to the new software. He says: "We had one programmer that had used PowerMILL in a previous job, which meant we could start using the software almost immediately. However, he had only used the software for three-axis programming so Delcam put one of its experts on-site for an intense session in five-axis operation. Similarly, we had on-site support when we needed to add some extra options for the new machine to the standard post-processor''

The benefits of the change soon became apparent. Darren Laker continues: "With our previous software, the tool wouldn't always be retracted far enough from the job so we had to check everything really carefully before we sent toolpaths to the machine or we would risk gouging the part. With PowerMILL, we haven't seen any similar problems. I'm sure the reliability comes from the fact that Delcam has its own manufacturing facility where it can test its software on real jobs.

"Programming our drilling routines has become much faster. With PowerMILL, you can detect all the holes in a model and group them by size automatically ready for drilling. Previously, we had to select, measure and program each hole individually''

PowerMILL's built-in CAD tools are also a big help, for example, when programmers want to add run-off surfaces to models or to cap holes before generating milling toolpaths. Models don't have to be sent back to the CAD office for modification, which could cause delays.

Even though Darren Laker knows that there is plenty more to come as his team becomes more familiar with PowerMILL, he is already convinced that the change was the right decision. "Most people I talk to about our business ask if I use Delcam software. I'm very pleased that I can now say "Yes" because of the credibility that comes from being a Delcam user."

**Aerospace toolmaker moves to PowerMILL**

G. Parker Aero Tooling Solutions, a rapidly expanding aerospace toolmaker, has changed to Delcam's PowerMILL CAM software to remove a programming bottleneck that was limiting the company's

productivity. The company, which has been based in Accrington in the North-West of England for over forty years and is now in its second generation of family ownership, produces a wide range of tooling, including jigs and fixtures, exclusively for the aerospace industry. It has been closely involved in designing and manufacturing tooling for many of the world's most prestigious aircraft programmes, including all Airbus platforms, plus the Eclipse and Honda VLJ programmes. Virtually all of the tooling is made as a 'one-off' so developing the most efficient machining approach for each project involves a steep learning curve.

Most of the staff are time-served toolmakers with a wealth of aerospace knowledge, and their skills and expertise are needed on almost every job. Managing director Mike Parker says: "We have built up a detailed knowledge of our customers' equipment so we

can make tooling that will be easy for them to install and efficient for them to use,"

Mike Parker investigated a number of alternative CAM programs before deciding on PowerMILL. The software provided a complete machining package that covers all the bases for the range of projects at G. Parker Aero Tooling Solutions, plus the price was very competitive. In addition, the company was already using Delcam's PowerINSPECT inspection software and had been impressed with both the software and the support provided.

Even though the staff have only been using PowerMILL for a few months, the effects have been dramatic. "We have effectively doubled our programming capacity with the three seats of PowerMILL because the software is so much easier to use" says Mike Parker.

The productivity boost from introducing PowerMILL has come at an important time for G. Parker Aero Tooling Solutions. Mike Parker concludes: "Business is pretty good. We already have enough projects lined up to make 2016 a better year than 2015. We have plans to add more 5-axis machines as they always seem to be fully booked and we will be recruiting two more apprentices''

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# At the forefront of 5-axis machining and simulation technology

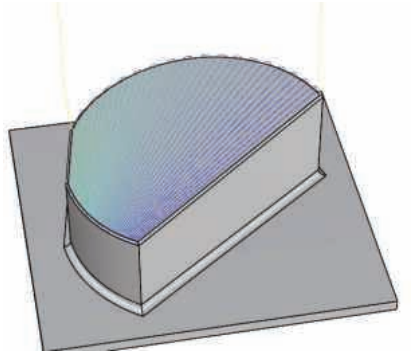
ModuleWorks, a leading supplier of CADCAM components for toolpath generation and simulation, has announced the latest release of its CAM components, ModuleWorks 2015.12, the third major update of 2015. Each ModuleWorks release contains many new and enhanced features across the product range. This latest version includes new features for 5-axis, 3-axis and simulation.

ModuleWorks is at the forefront of 5-axis machining and simulation technology, providing the toolpath and simulation technology that powers many of the leading CAM systems available around the world today.

**5-axis machining**
When a surface extends beyond the ends of a curve, the new Extend curves feature automatically extends the curves. This prevents unwanted wrap-around of the toolpath, improves the pattern and saves time by eliminating the need to manually extend the curves.

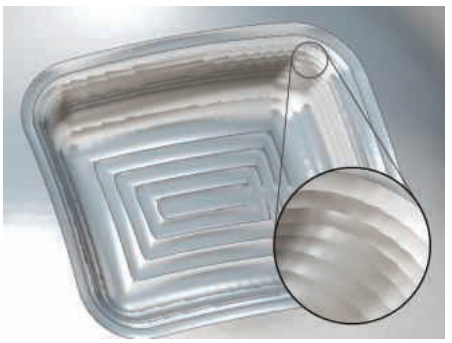
**Extend curves**
Automatic spine creation for port machining has also been enhanced. If the spine gets too close to the machining surface at any point, the toolpath with full collision checking is now created up to that point. A new projection method is provided for Geodesic machining. The containment curve is now projected in the surface normal direction for the selected machining surfaces.

**3-axis machining**
New trimming criteria provide more efficient processing of cusps near the containment curve by preserving all the cuts where the tool contact points are inside the curve.



With the new Multiple stock to leave feature, users can define different rest material thicknesses for different machining surfaces. This is particularly important for mold and die production that involve multiple machining steps with heat treatment in between.

**Multiple machining surface offsets**
The enhanced roughing algorithms speed up the roughing calculation by 25 percent on average, and up to 50 percent in some cases.



**Simulation**
The new automatic quality improvement feature refines the accuracy of the stock model whenever the cutting simulation is idle. This improves accuracy and saves time because there is no need for manual refinement.

**Automatic quality improvements**
The quality of the machined surface has also been improved through the implementation of a new normal computation method. A new feature for spindle clamps gives you the option to make them transparent when the spindle is rotating.

**ModuleWorks announces new partnership**
ModuleWorks and Aixtooling, providers of precision molding technology for optical glass, has announced the results of its partnership.

Aixtooling and ModuleWorks first worked together on research projects as far back as 2008. These projects, and in particular 3DOptics and OptiStruct helped ModuleWorks develop Optics software technology which could then be applied in the Optics manufacturing process by

Aixtooling. Further research projects, KoDaRe and MicroAdapt, are now allowing this research to progress even further.

Aixtooling was originally established 10 years ago as a spin off from Fraunhofer IPT in Aachen, with the aim to make optics manufacturing technology available to industry. Good strategic partnerships, the use and mastery of excellent equipment, extensive technological expertise, trusting collaboration with customers, and the trend towards wider use of complexly shaped optics are the fundamental principles of Aixtooling GmbH, and in the past few years they have led to successful corporate development.

As the geometric demands of optics parts continue to increase and the demand for quality also increases, there is plenty of potential for the partnership to expand over the coming years. Bernd Bresseler, managing director at Aixtooling says: ''We are delighted with the progress we have made over the last ten years and look forward to continued success in the future''

Yavuz Murtezaoglu, managing director at ModuleWorks says: ''By working with partners such as Aixtooling we are able to develop our toolpath algorithms to be optimal for specialised applications such as optical molds. We value the application expertise provided by our partners, and are happy that we are able to help them establish market leading positions by taking our algorithms to the market''

ModuleWorks is a software component provider for the CADCAM industry. ModuleWorks' expertise in 5-axis simultaneous machining and simulation is recognised throughout the CAM industry and its software components and development services are used by the majority of the leading CAM vendors.

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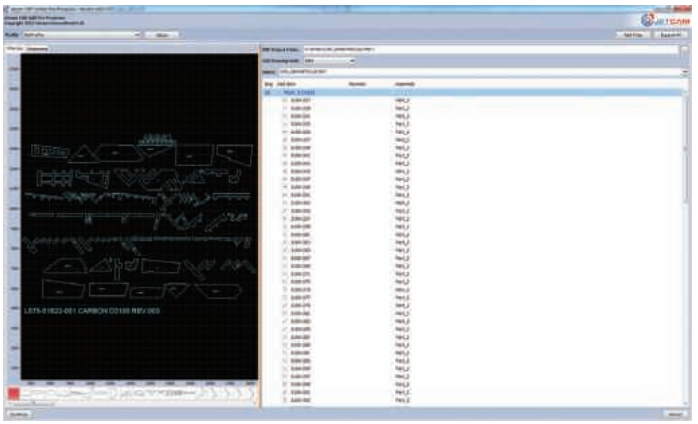
# New order controller software

JETCAM International s.a.r.l. has released version 1.65 of JETCAM Orders Controller (JOC) Premium and Premium Automation with two major new CAD import features, aimed at streamlining the CAD file to NC code generation process.

Many companies receive CAD files of components from their customers in a single DXF 'nest', which has to be split down into individual geometries. JOC now includes a DXF splitter that can automatically extract these entities, applying profile-based rules such as tolerances and whether text within an entity should be used as each filename. The splitting process takes just a few seconds, even for complex nests containing dozens or even hundreds of individual entities. Once split, users can preview each file or the entire nest before continuing the CAD import process to create native JETCAM component files, ready for nesting.



JETCAM's CAM and nesting system, JETCAM Expert, includes a powerful CAD filtering function, which can automatically 'heal' common problems. This functionality has been extended and enhanced through to JOC. As with the DXF Splitter, individual profiles can be created which can then be applied to single files or batches automatically. This allows users to create rules to be automatically applied to, for example, a given customer's supplied DXFs so that common issues can be automatically addressed just by selecting the profile.

Martin Bailey, general manager says: "The process of moving geometry data from CAD to CAM can prove problematic for some, with one prospective customer recently telling us he once spent several weeks manually splitting nests for a large order. The latest version of JETCAM Orders Controller helps further streamline the process for JETCAM users. Once profiles have been created a user can take DXFs containing multiple entities, split them, apply filters during processing and then automatically generate highly optimised nests with just a few clicks of a mouse."

Both new features are included in the latest releases and are available for immediate download from the JETCAM website.

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**www.jetcam.com**

# TONiC optical encoders

A continuous product development cycle, horizontal organisational structure and streamlined range of model sizes have made COORD-3 a global CMM brand. Renishaw supplies a wide-range of precision metrology products to COORD-3 and both companies benefit from a long-standing and successful partnership.

Renishaw enhances the COORD-3 customer solution with products that increase CMM throughput, accuracy and automation, resulting in increased sales backed by a strong global support network. Renishaw has also built valuable synergies with COORD-3 to support its demanding product design strategies.

Patrizio Vaccaro, marketing manager for COORD-3, says: "Since 2009, we have launched at least two products per year into the market. Our new bridge-type Universal CMM family features a brand-new design and was launched only one year after the project started."

**TONiC™ and FASTRACK**

COORD-3 is one of the few suppliers to manufacture its CMM structures from aluminium alloy and silicon-carbide, offering maximum metrology performance and productivity.

Even in a lab with environmental control, traditional granite CMM frames have significant thermal mass and take much longer to absorb and dissipate thermal changes, whereas, aluminium's high coefficient of thermal conductivity allows the machine structure to respond more rapidly and linearly with temperature fluctuations.


This is important as it is necessary to predict CMM thermal behaviour and compensate for it in order to ensure machine accuracy over its operating temperature range. CMMs that expand linearly without induced constraints are easier to compensate for, which improves measurement repeatability.

The low structural weight of aluminium also improves the CMM's acceleration and deceleration, enhancing overall traverse speed and ultimately increasing measurement throughput.

This allows the CMM to operate at relatively high speed, which is particularly important for in-line applications where inspection operations need to keep pace with production.

Renishaw provides real-time temperature compensation with its 3-axis UCC S3 and 5-axis UCC T5 controllers, allowing temperature monitoring of up to 16 different locations, using sensors which can be fixed to the X, Y, and Z axes of the CMM and to the workpiece being measured. The thermal data is then combined with axis feedback from the TONiC encoder system to produce high fidelity measurements that allow the machine to minimise thermal error and reduce measurement uncertainty.

A TONiC readhead, with 0.1 µm resolution, and RTLC FASTRACK scale, is installed on each CMM axis. FASTRACK is a scale carrier system, comprising two miniature guide rails, that securely retains Renishaw's 8 mm x 0.2 mm low-profile stainless steel scales and allows them to freely expand at their own CTE (Coefficient of Thermal Expansion) with almost zero hysteresis (for example, <1 µm on a centre-clamped 2 metre axis over the entire operating temperature range). Another advantage of this system is that damaged scale can be quickly removed and replaced, even when access is limited, thus reducing machine downtime. This feature is also ideal for large machines that need to be sectioned prior to transportation.

**The PH20 probe**

COORD-3 CMMs can also feature a Renishaw PH20 touch-trigger system, which allows easy access to features at any angle and can deliver a 3-fold increase in measurement throughput over traditional systems. Unlike conventional touch-trigger measurement methods, which rely on speeding up the motion of the CMM to measure quickly, PH20 utilises head motion technology developed for the multi-award winning REVO® system to minimise the dynamic errors of the CMM at higher measurement speeds.

**Global support**

A great strength of COORD-3 is its after-market service, since the real value of CMM products is in the customer experience and overall lifetime costs. High-quality and rapid customer support enhances the customers' perception of value and trust in the COORD-3 brand.

Patrizio Vaccaro concludes: "If a foreign COORD-3 customer needs some assistance, say a probe installed on one of our machines, we can always count on the quality of Renishaw's global support. Renishaw's global network allows us to give our customers the best after market service, wherever they are."

**A winning team**

Renishaw's TONiC encoder system with RTLC scale on FASTRACK, PH20 probe heads and many other leading metrology products give COORD-3 the tools it needs to grow its business with cutting-edge CMM technology. This technical collaboration allows both companies to remain at the forefront of new product development.

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# A smooth ride for manufacturers with Hexagon Manufacturing Intelligence

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# Hybrid coordinate measuring machine with touch software

**COORD3 Universal 5-axis CMM**
Perceptron Metrology UK Ltd has launched a full range of 5-axis CMMs complete with the revolutionary Renishaw® REVO-2 scanning probe and a fully-integrated UCC CMM controller and MODUS® metrology software.


Martin Hawkins, Perceptrons UK CMM account manager, says: "By combining the metrology stability of the COORD3 Universal CMM with the latest Renishaw REVO-2 5-axis measuring system, CMM dynamic error is minimised for high-speed probe motion since all part feature scanning motion is within the REVO-2 head''

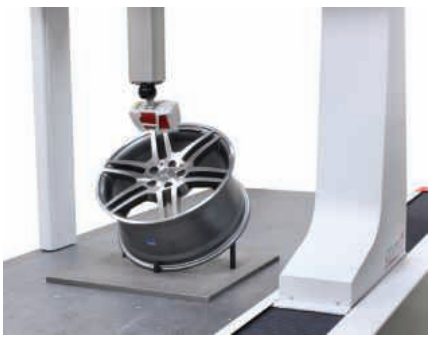
The Universal CMMs utilise a high-technology alloy moving frame design that provides the benchmark for dynamics and measuring accuracy performance. This design overcomes the issues associated with operating traditional build CMM structures, in the typical, less than perfect CMM operating environments. A CMM thermal compensation system of both machine and part, allows the measuring system to automatically and dynamically compensate for changes in the CMM operating environment. This system allows the CMM to perform with stated measuring accuracy between 16 and 26° C. Gold-plated 0.1µm measuring scales are free-floating in support tracks, eliminating any CMM structural changes from influencing its measuring accuracy.

Universal CMMs have a very efficient design in terms of machine simplicity which improves long-term reliability and ultimately cost of CMM ownership. The COORD3 Universal CMMs have an isostatic design for each axis that provides optimum machine geometrical alignment in the construction of the machine, which ultimately benefits the ability to make accurate field calibrations.

The COORD3 Universal CMM has a monolithic base-plate, with integral inverted dovetail guideway, and a generous 90 mm x 90 mm Z Ram section providing outstanding metrological performances. Direct axis drives, using toothed drive belts, provide the vibration-free motion with zero hysteresis.

Universal CMMs can also be equipped with an optional SZP (Safety Zone Protection System) which uses laser scanners to monitor the defined protection zone when the CMM is in high speed automatic measuring mode. SZP reduces the CMM speed upon infringement of the safety zone by an operator and automatically returns the CMM to its full measuring speed, only after the zone infringement has been cleared. The SZP system allows safe use of the CMM in a production, shop-floor and fully-automated applications.

The COORD3 Universal CMM range accommodates part sizes up to 3000 mm x 1500 mm x 1200 mm. COORD3 has already supplied 5-axis CMM's to aerospace manufacturing companies.



Perceptron has launched a CNC multi-sensor CMM solution that seamlessly integrates touch-probe and laser scanning functionality into a single measuring station, operated exclusively by touch software. The Perceptron EXPERT CMM offers full point-cloud geometric feature extraction and direct comparison to CAD for automated inspection of production parts. The automatic scanning package price is comparable to lower accuracy manual portable arm measuring solutions. Laser

scanning has proven its role in manufacturing in recent years with the increased application of manual portable arm scanning systems. These labour intensive systems are more suitable for reverse engineering and one-off inspection tasks. Perceptron has harnessed its expertise in automated inline production metrology for global vehicle production by widening the reach of its industry-leading scanning technology for general manufacturing. Although the software complexity of traditional measuring equipment mandated its use by metrology experts; Perceptron's TouchCloud™ software module add-on for its TouchDMIS™ software puts the EXPERT into the solution, and significantly reduces the necessary user skill level.

Full feature extraction from point-cloud rather than rendered .STL format provides faster and more accurate measurements. Part features can be touch-probed or laser-scanned depending on feature type and tolerance.

The Perceptron ScanR scanner is available with a standard red laser line, and optionally with a green laser to significantly extend dynamic range, allowing scanning of both highly reflective and black parts. EXPERT CMM can also be supplied with any size and configuration CMM from the Perceptron Coord3 CMM range or retrofitted to existing customer-installed CMMs.

Martin Hawkins says: "Perceptron is a leader in supplying automated metrology using robotic technology for the automotive industry in their most demanding production line applications. The EXPERT CMM package further extends the reach of our technology into global manufacturing."

**Perceptron Metrology UK Ltd**
**Tel: 0121 629 7794**
**Email: uk@perceptron.com**
**www.perceptron-metrology.co.uk**

# New range of micro hardness testers

Bowers Group is pleased to announce a fantastic new range of micro hardness testing machines from INNOVATEST, a leading manufacturer of hardness testing machines. The Nova 130/240 series of Micro Vickers and Knoop hardness testing machines offer a versatile and user friendly solution for a wide range of micro-hardness testing applications.

The NOVA 130 features a three position turret which includes one indenter position as well as a 10 x and 40 x objective. The NOVA 240 is well equipped for more demanding applications, featuring a four position turret including one indenter position, as well as 5 x, 10 x and 40 x objectives.

Both units include USB output, up to 9 dial selectable test forces, and a full colour touch screen with interaction dialogue support which tells the user about the current status of the device, including instructions on performing one or more tests. The user is lead step by step through the handling of the tester by the intelligent dialogue system, and the bright colours on the display clearly inform the user of the test results. Bowers Group represents INNOVATEST's range of hardness testers in the UK and Ireland, and the Nova 130/240 series is the latest addition to the wide selection of hardness testing machine offered by Bowers Group. Paul Hold, technical sales manager for CV Instruments at Bowers Group, says: "The new NOVA 130 and 240 series Vickers and Knoop hardness testers are market leaders in their field of application. As advanced, yet traditional dead weight machines, these hardness testers offer an intelligent dialog system to guide the user through their handling, making them incredibly easy to use and extremely versatile."

Made in the Netherlands, the Nova 130/240 series is made using the best quality components for both electronics and mechanics. It is also covered by INNOVATEST's two year manufacturers' guarantee.

Bowers provides a wide choice of cost-effective, quality measuring instruments. 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 exports 82 percent of our output.

**Bowers Group**
**Tel: 01276 469866**
**Email: sales@bowersgroup.co.uk**
**www.bowersgroup.co.uk**

# DJJ is given 'quality assurance'

Since the company's formation in 1976, South Wales based DJJ Precision Engineering Ltd. has earned an enviable reputation for the quality of its output. Prompted by customer demand, over the past four decades the company has continually increased the range of services it provides and has significantly expanded its productive capacity.

DJJ now manufactures and supplies an impressive range of high-precision turned and milled parts to many well-known UK based and international companies. Amongst other demanding sectors currently served, are the global automotive, aerospace, marine, defence, medical and gas industries.

A policy of regular staff training, continuous investment in the best available machine tools, the procurement of advanced inspection aids and the administration of a stringent quality regime has supported the company's impressive growth.

Dennis Jones managing director of DJJ says: "We continue to invest heavily in high end CNC machinery and have invested in excess of £1 million over the last 3 years. This has abled us to offer our clients a complete 'one stop shop' service that operates around the clock, we are capable of providing everything from design and prototyping expertise through to full batch production and global delivery.

"Our quality ethos permeates every aspect of our activities. Throughout every process, all parts engineered by DJJ are subject to thorough inspection routines, including first-off, intermediate and final inspection procedures to ensure zero defect deliveries.

"We supply our clients with part submission warrants, appearance approval reports, dimensional reports and material test reports, and follow their instructions and design specification.

"The implementation and adherence to ISO 9001 helps enable continuous improvement to our quality management systems (QMS) and processes. In turn, this improves the ability of our operations to meet customer requirements and expectations."

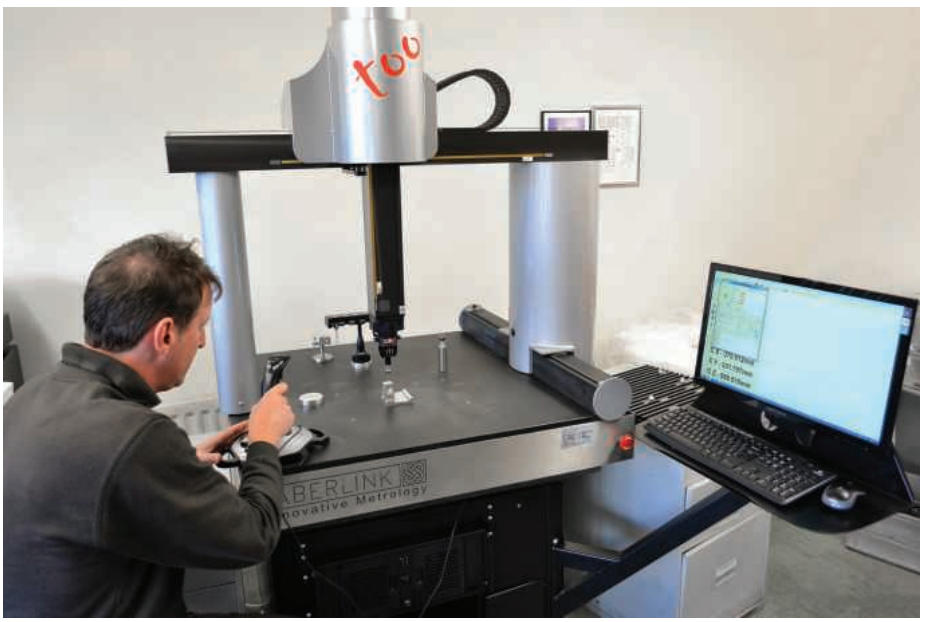
To help the company retain its reputation for quality, raise its precision capabilities and to enable the automatic generation of inspection reports, Dennis Jones, recently searched for a suitable advanced Coordinate Measuring Machine (CMM). In order to handle the large volume of accurate work passing through the company's busy quality department, the proposed precise CMM needed to be able to perform rapid, automated measuring routines and be easy to program and operate

Dennis Jones says: "Having identified the need for an advanced new CMM that could remove the potential for bottlenecks from our Inspection Department, we investigated the various options. Although we considered several alternatives, a practical demonstration of Aberlink's impressive Axiom Too convinced me that the machine had all of the features we needed. In addition to having the required accuracy specification, the Axiom Too was also able to perform the quickest, automated CNC measuring routines of all of the CMMs we looked at. Also, the Axiom Too's large component support meant that we could load multiple components and measure them in a fully automatic CNC mode. Other factors, such as Aberlink's easy to use Measure 3D software and the CMM's cost effective price, helped convince us to place an order.

"To enable even quicker inspection routines we specified the machine fitted with a Renishaw RTP20 probe system. Also, to allow the fast, accurate measurement of low-profile 2D parts, and small and delicate components, we ordered Aberlink's high resolution CMM camera system that enables non-contact inspection techniques to be undertaken."

The Axiom Too is the best-selling CMM from Aberlink Innovative Metrology, the largest UK owned Coordinate Measuring Machine manufacturer. Available in manual and CNC variants and in a range of capacities, the recently upgraded CMM can truly be described as the complete Inspection Centre; high measuring accuracies are achieved through the use of the latest metrology techniques and advanced in-house manufacturing methods. The Axiom Too boasts an aluminium bridge with a very low thermal mass, rendering the machine ideal for use either in controlled environments or within less than perfect shop-floor conditions.

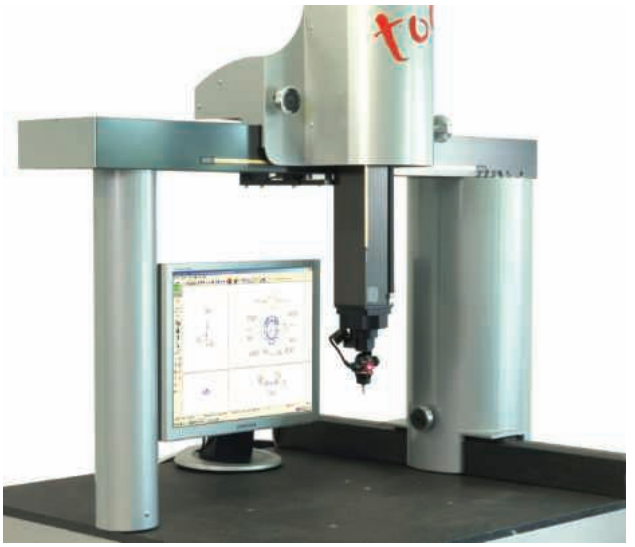
Thanks to the Axiom Too's use of advanced materials, the machine's reduced inertia results in class leading speed of operation. For increased accuracy air bearings of optimised stiffness are employed on all axes, whilst a granite Y Beam allows preloading of bridge bearings in both directions. Borrowed from the Aerospace industry, the CMM's sturdy component support consists of an advanced granite/aluminium honeycomb construction, this technology, provides natural damping and further improves the machine's thermal properties. Despite the Axiom Too's generous measuring volume 640 x 600 x 500 or 640 x 900 x 500, the machine's compact design occupies a



relatively small footprint, with the controller and all peripherals housed within the Axiom Too's workbench.

The easy-to-use Axiom Too utilises Aberlink's well-known, intuitive 3D software, ensuring greater user productivity and profitability. A welcome bi-product of any Aberlink CMM inspection routine is that a simultaneous picture of the measured component is created on the computer screen. Dimensions between the measured features, mirroring those that appear on the component drawing, are then picked off as required. In essence this 'smart' software represents an intelligent measuring system that is able to automatically recognise and define the various features being measured. Aberlink 3D is claimed to be the easiest to use CMM software currently available, as a result a complete novice is usually able to perform relatively involved measurement routines after just five minutes training.

Dennis Jones concludes: "Since the Aberlink Axiom Too's installation our operators have quickly mastered our new CMM and it has quickly become an invaluable tool for confirming the quality of our output. The high precision nature of the Axiom Too enables us to undertake the most accurate and complex of measuring routines, whilst its speed has eliminated the possibility of inspection hold-ups. In addition, our new Aberlink CMM's ability to generate in-depth inspection reports has been welcomed by our customers."



"Illustrating the Aberlink CMM's value to us and the importance we place on the quality of our output, the 'Inspection' page of our company website features a video clip of the Aberlink CMM in action."

Now the largest UK owned CMM manufacturer, Aberlink's comprehensive range includes 23 standard sizes of both CNC and manual CMM variants. Aberlink CMMs enable the precise measurement of the smallest of components, to parts of over three metres long and up to six tonnes in weight. Customers are also able to select from a wide range of probing and non-contact measurement options and on-machine fixturing. The company's wide range of available solutions allows Aberlink to offer high quality CMMs and vision measuring systems to suit all applications and budgets.

**Aberlink Innovative Metrology LLP**
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**Email: gavin@aberlink.co.uk**
**www.aberlink.com**

# TRUMPF opens its doors to the future

## Open House, Luton 15th –17th March 2016

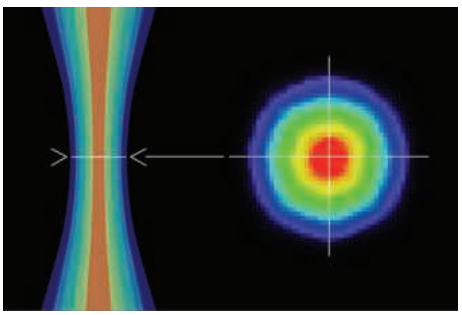
TRUMPF opens the doors to its powerhouse in March. For the first time in the UK, the company will be showcasing the TruLaser 5030 fiber with TruDisk 8001, the first 2D laser machine to provide 8 kW of laser power. The result is maximum productivity across the entire sheet thickness spectrum and, notably, the ability to cut stainless steel up to 40 mm; 10 mm thicker than its nearest competitor.

The Luton showroom at this event will be packed with the latest machines to demonstrate TRUMPF's innovation and capability. As well as laser processing in all its forms, the company will be showing its new TruPunch 3000 with SheetMaster automation for lights out punching and profiling and the entire range of TruBend press brakes. Another hot topic will be TruServices, all of the support services that TRUMPF provides to ensure its customers get the very best return on their machine investment.

**First 2D laser cutting machine with 8 kW of power**

Appearing for the first time in the UK at the TRUMPF Open House will be the TruLaser 5030 fiber with TruDisk 8001, the first 2D laser machine to provide 8 kW of laser power. Its fibre-guided solid state laser and highly dynamic drives enables the user to obtain maximum productivity across the entire sheet thickness spectrum; stainless steel at thicknesses up to 40mm are well within its scope. This is the ideal machine for mixed metal and multiple application production.

Top quality cutting results are assured by BrightLine fiber, the TRUMPF technology that allows users to change from highly productive thin to high quality thick sheet processing on just one machine. On the TruLaser 5030 fiber 8 kW, this unique capability is complemented by a range of functions including CoolLine and the newly improved PierceLine. Other new features are Smart Beam Control, a new Condition Guide function, Smart Collision Prevention and Drop & Cut.



CoolLine is a new feature for solid-state lasers which stabilises the steel cutting process by employing selective cooling of the workpiece. The result is greater material tolerance, for example, for lower quality mild steel. It also allows much more intricate parts to be cut and a tighter sheet layout to be adopted. The newly improved PierceLine enhances the production process by enabling even smaller contours to be cut while significantly boosting speed.

Smart Beam Control is an intelligent monitoring system that automatically regulates the laser's focal position during the cutting process. The result is enhanced process reliability and the feature also makes it possible to perform cutting system diagnostics at the machine or remotely via Teleservice. This lends even greater reliability to the solid-state laser machines in the TruLaser Series 5000. Smart Beam Control automatically regulates the laser's focal position during the cutting process itself. This function makes for constant superior reliability and makes it possible, in addition, to carry out a diagnosis of the cutting system.

To provide an instant health check of the machine, TRUMPF has also developed the new Condition Guide function. A traffic light system provides information on the condition of key elements that affect the machine's cutting capacity and it can also flag up any corrective action that needs to be taken by the operator. Line charts show the history of the particular condition and simplify forecasting the need for intervention. Consequently, maintenance work can be scheduled to minimise impact on production.

The new Condition Guide function for the TruLaser Series 5000 enhances transparency. A single glance is enough to determine the machine's status. A traffic light system provides information on the condition of key elements that affect the machine's cutting capacity. The Condition Guide can, if desired, provide information on corrective actions to be taken by the operator. Line charts show the history of the particular condition and simplify forecasting the need for intervention. Consequently, maintenance work can be planned both efficiently and in harmony with actual needs.

Two more new functions, Smart Collision Prevention and Drop & Cut, also play an important part in the machine's efficiency and superior process reliability. Smart Collision Prevention analyses the entire cutting procedure and generates an intelligent process strategy. Parts at risk of tipping over are cut free only where there is no longer any risk of collision. This means sheets can be cut reliably without the need

for micro-joints and no process supervision is necessary which frees up the operator for other tasks.

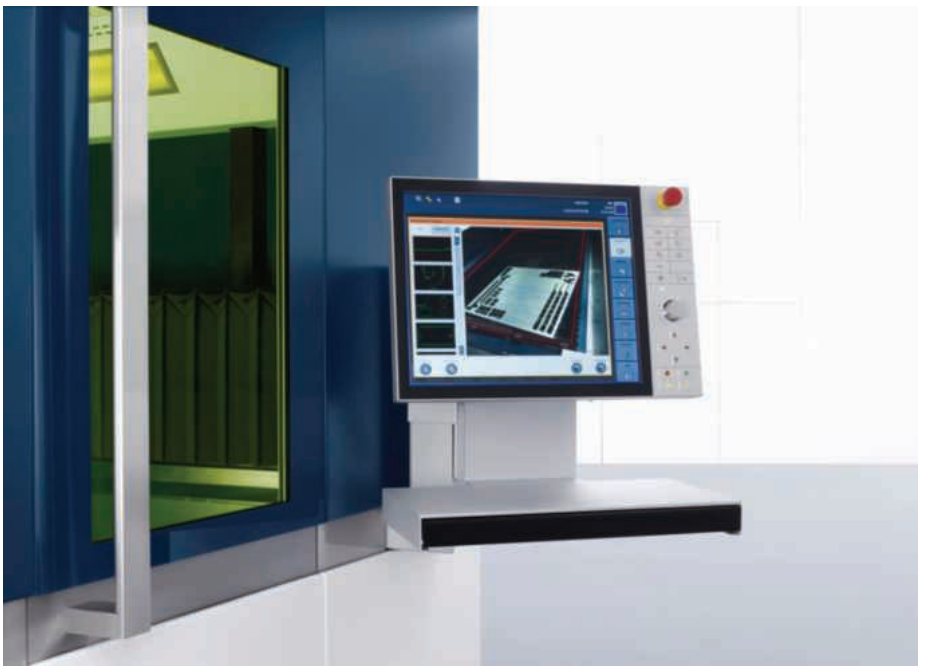
When coupled with the Smart Nozzle automation function that monitors the efficiency of the nozzle and the PierceLine process, Smart Collision Prevention assures maximum process reliability and expands machine capacity while reducing the need for consumables.

Scrap material is an important issue for job shops. Drop & Cut is a new introduction from TRUMPF which makes repeat production more cost-effective and enables residual sheets to be used to minimise wastage. The operator is presented with a live image of the machine interior on the control unit's user interface. The programmed contour can then be virtually dragged and dropped onto the scrap skeleton in the desired orientation. With the TruLaser fiber 8 kW this process is conveniently managed from a new and ergonomic 19-inch control panel that can be adjusted to any height.

Other optional features of the machine include the application of a standardised, industrial dot matrix code to cut parts and a mobile system for monitoring and controlling the 2D laser machine via an iPad app. Using the machine's own wireless network, the screen of the control panel is transmitted to the iPad so production can be controlled remotely; camera images can also be received to enhance the function.

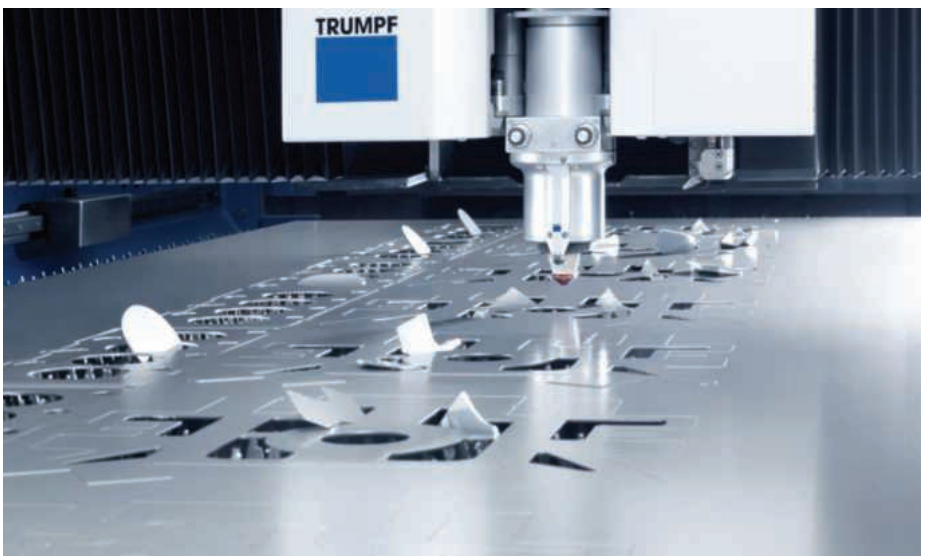
TRUMPF presented the TruLaser 5030 fiber at the recent Blechexpo in Stuttgart, featuring both new functions and an additional choice of laser power.

The performance capacities of the 2D laser machines and the solid-state lasers made by TRUMPF continue to advance. Just as in previous years, TRUMPF has unveiled technology highlights at each trade fair, redefining the standards for cutting with a solid-state laser. Worthy of special mention are the BrightLine fiber function, which turned the solid-state laser into an all-purpose tool, and the CoolLine feature. The latter stabilises the cutting process for thick mild steel by way of closely defined cooling. This makes it possible, for instance, to cut extremely tight curves.



At Blechexpo, TRUMPF once again introduced new innovations that will make a decisive advance in laser cutting.

TRUMPF also showed the TruLaser 5030 fiber in Stuttgart with new laser power. In addition to the three, five and eight kilowatt power levels offered in the past, the machine is now also available with the six kW TruDisk 6001 laser. Especially at medium and heavy sheet metal gauges this makes for quick processing. Using the TruDisk 6001 and the functions cited here the TruLaser 5030 fiber cuts mild steel, stainless steel and aluminum up to 25 mm thick and copper and brass as much as 10 mm thick, both quickly and with enviable dependability.




**A positive manufacturing environment**

Newly appointed TRUMPF UK managing director, Annette Doyle says that feedback from customers has been very positive and there is high demand in the market for the new technology that TRUMPF is developing. She notes that the UK market is ideal for introducing new machines in a positive manufacturing environment. The showroom development in Luton shows its commitment to the UK and, coupled with a strong leadership team, can only enhance confidence in the company to provide the perfect solutions for metal fabricators.

Automation is increasingly important for this sector, with almost one in two TRUMPF machines sold with this incorporated in the package.

Register online at:
**www.uk.trumpf.com/open-house** or email **marketing@uk.trumpf.com** stating the date of your visit and listing the names of the delegates.

**TRUMPF Ltd**
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**www.uk.trumpf.com**

# MBA introduces revolutionary KIMLA fibre laser to UK market

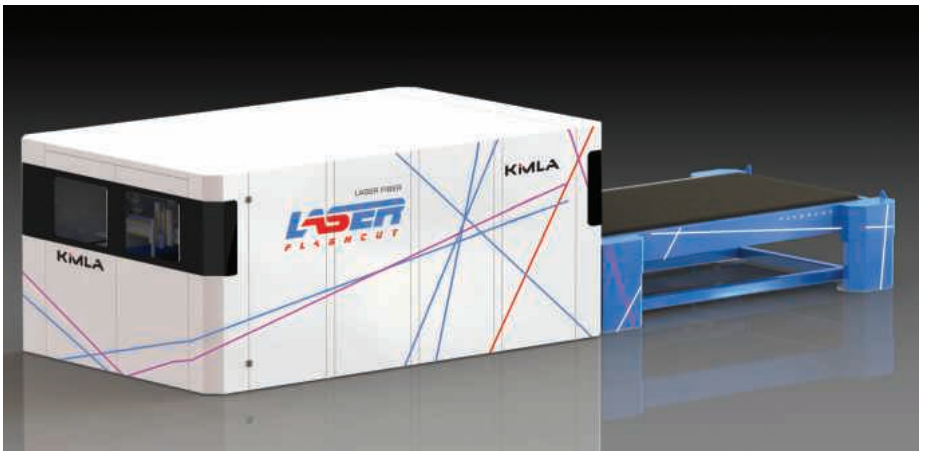
Yorkshire-based company MBA Engineering are to become the UK distributor for KIMLA, the Polish manufacturer of state-of-the-art CNC machinery.

Through MBA, customers will have access to some of the most advanced technology on the market, including new KIMLA fibre laser cutting machines, which offer significant advantages in terms of performance, speed and cost over more traditional $CO_2$ lasers.

Established in 2009 to offer support to Bystronic laser users, MBA Engineering has built a reputation for unrivalled customer service. With services including breakdown assistance, preventative maintenance, customer training, machine moves and installations, MBA offers industry-leading response times and has topped the Association of Industrial Laser Users breakdown response satisfaction survey for the last three years. The company continues to grow and expand and with its association with KIMLA is now moving into the supply of new fibre laser machinery.

Although new to the UK market, KIMLA has over 16 years' experience in the design and production of advanced laser and waterjet cutting machinery. Its innovative designs achieve industry-leading performance competitively priced with comparable machines in the UK.

Key features include the ultra-reliable IPG solid state laser source fully supported by IPG UK, Precitec Pro cutting heads specifically designed for fibre lasers, and the use of linear drives which, coupled with




Kimla's unique control system, allow for unparalleled acceleration and cutting speeds whilst cutting down on maintenance and servicing requirements.

KIMLA offers a tailored CADCAM and nesting package as standard. A remarkably small footprint due to the integrated machine concept facilitates easy installation and takes up very little room on the factory floor. With an impressive installation time of just two days, clients exchanging machines can expect reduced downtime.

The partnership between MBA Engineering and KIMLA will allow customers to take advantage of the very latest fibre laser technology at a competitive price, whilst benefiting from full support and service by MBA. Machine spares will be available from the company's offices in Wetherby, North Yorkshire at substantially reduced costs. MBA is also the only fully trained company in the UK with a clean room environment for head repairs and servicing.

Both for established laser users and new customers considering a move into the fast-growing fibre laser market, MBA Engineering and KIMLA can offer an impressive combination of performance, cost, efficiency and reliability.

New machines are already running in production in the UK for both subcontract and OEM users.

**Key features include:**

- Competitively priced versus comparable machines
- Available from 30 15 to 80 20 designs, all sheets can be processed quickly and economically
- Low operating costs and minimal energy usage and no laser gases
- Automation option available
- Unparalleled high part production with excellent cut quality
- IPG solid state laser source available from 2 kw to 8 kw
- Precitec Pro cutting heads specifically designed for fibre lasers
- 2-year warranty for parts and labour as standard

Viewings and demonstrations are available, so contact MBA representatives in order to discuss a tailored package to suit your needs.

**MBA Engineering Systems Ltd**
**Tel: 0113 238 5401**
**Email: enquiries@mba-eng.co.uk**
**www.mba-eng.co.uk**

Bystronic

Best choice.

# Open House

11th – 15th April 2016, Coventry

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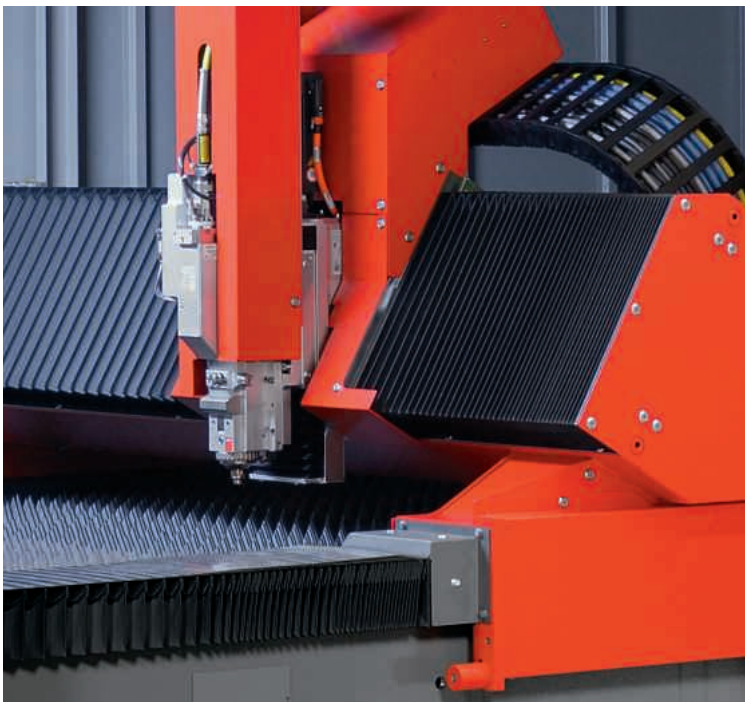

Monday 11th to Friday 15th April 2016

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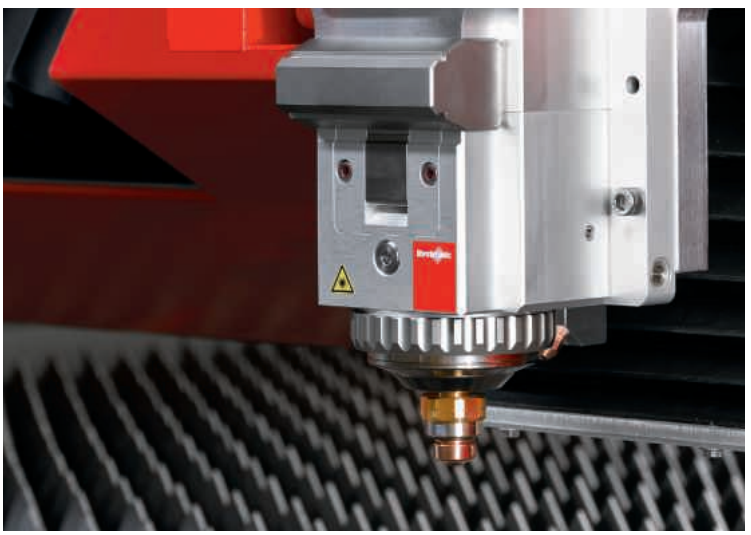
EXCLUSIVE LAUNCH

**New ByStar Fiber 3015 6kW Laser**



# Stress-relieve sheet metal components in a vibratory bowl

Factories with metalcutting machines invariably use vibratory finishing equipment to remove burrs and sharp edges from components. If parts have been laser-cut from sheet metal, however, deburring and surface enhancement are sometimes secondary. The main purpose of the rumbling action can be to stress-relieve case hardening in the heat-affected zone (HAZ) around the component edges.

One sheet metal subcontractor that exploits this technique is Rotherham-based ESP Laser Cutting, which part-exchanged its decade-old PDJ Vibro vibratory bowl in January 2016 with a new model from the same supplier.

ESP Laser Cutting says that its vibratory finishing bowl from PDJ Vibro stress-relieves the case hardening that occurs around the edges of laser-cut sheet metal components

The HAZ on sheet metal edges caused by a high temperature laser beam is problematic for several reasons, especially on components over 10 mm thick, although all material gauges are affected. First, it can complicate fabrication by distorting the weld. Second, it prematurely wears milling cutters and drills if the parts are being machined around the outside. Additionally, paint and other coatings such as zinc tend to flake away, necessitating costly rework.

All of these problems are resolved if parts are processed in a vibratory bowl. The maximum size of laser-cut component that can be accommodated in the PDJ Vibro EVP-RA 315 circular, 385-litre bowl at ESP is 400 mm x 400 mm. Above that, if parts need to have their edges stress-relieved, they are shot blasted.

An alternative is to laser cut sheet with nitrogen as the assist gas, rather than oxygen, which is effective at reducing the HAZ on stainless steel and to a lesser extent on mild steel up to 6 mm thick. The only sheet material that is not unduly affected by case-hardening during laser profiling is aluminium, but even these components do not escape the vibratory bowl as flashes often form that need to be removed. Similar occurs in other materials if the laser cutting machine's settings drift and the operator does not notice.

ESP's sales director Stephen McMillan is one of the most experienced laser cutting specialists in the UK, having used a 1 kW Ferranti slow-flow laser for production applications more than 28 years ago. He now uses the most modern plant on the market, a 6 kW $CO_2$ laser profiler purchased in May 2014 and a fibre laser of similar power installed one year later, both 3 metre x 1.5 metre capacity machines from Bystronic.

The latter machine was the first in the country to be fitted with PowerCut technology, which increases by about 50 percent the thickness of plate that can be cut (for example, 30 mm aluminium rather than 20 mm). It also raises the profiling speed for these thicker materials to compete with $CO_2$ lasers.

Stephen McMillan says: "Soon after I set up ESP in 1994, customers started asking for their parts to be stress-relieved by rumbling.

"We decided to subcontract the work and identified PDJ Vibro's service at its Bletchley technical centre to be the best on offer.

"As the volume of work increased, we found ourselves spending £2,000 per month on the service, so it made sense to buy a vibratory bowl from them and bring the facility in-house, which is what we did."

He added that the vibratory finishing machine worked well until its replacement earlier this year, as has a similar size of PDJ Vibro maize dryer still in use to prevent oxidation of components after they come out of the water-dosed ceramic media in the other vibratory bowl.

**PDJ Vibro Ltd**
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**Email: david.hurley@pdjvibro.co.uk**
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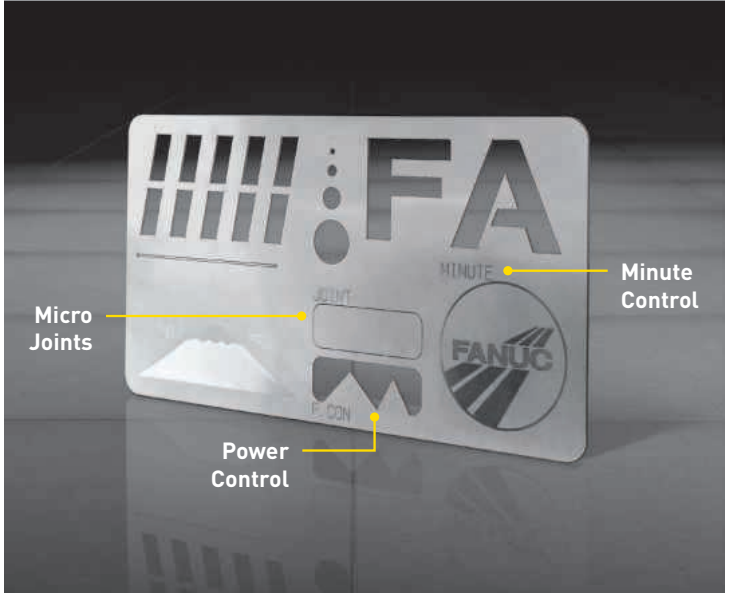
FANUC

# FANUC Fiber Laser

line 1 to 6 kW


**NEW**

Sample of thin material cut using FANUC Fiber Laser

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ES0216

# New fibre machine cuts cutting time to six

At the Witton, Birmingham factory of Wheeler Fabrications, a 3 kW fibre laser cutting machine from Bystronic UK has taken over from an older, second-hand $CO_2$ laser, dramatically raising productivity and product consistency as well as allowing the subcontractor to reduce both lead-times and costs to customers.

When the company was visited in November 2015, a job on the 3 kW Bystronic BySprint Fiber 3015 was completed in under six hours. It involved producing 125 units from 1.5 mm and 3 mm stainless steel sheet for oil rig safety lights.

Production manager Mark Ashford, who started with the company 20 years ago as an apprentice, said that the contract would have taken four days to finish on the previous $CO_2$ laser, which in any case would have struggled to cut the thicker material:

"Eighty per cent of our work here involves sheet between 1 mm and 3 mm thick, which is ideal for extracting maximum benefit from fibre laser cutting.

"The BySprint Fiber machine, due to a combination of its technology and the high power of the laser, is five times faster at profiling components than the machine that it replaced.

"It is also significantly less expensive to run, as it pulls less power and does not require costly servicing of optics. Neither do we have to buy bottles of helium or $CO_2$ resonator gas any more.

"It means that we can manufacture more economically, allowing us to pass on cost reductions to our customers and at the same time maintain profitability."

Wheeler Fabrications apprentice Amy Rollins operating the Bystronic Bysprint Fiber 3015

He explains that another advantage of fibre laser cutting is its ability to machine reflective materials, as there are no optics to become damaged. Copper, brass, aluminium and stainless steel sheet up to 3 metres by 1.5 metres in various thicknesses from 0.5 mm to 6 mm are processed without difficulty: "They all cut like a dream", he enthuses.

Established 35 years ago by owner Bryan Wheeler as a factory maintenance firm serving large companies in the area such as Dunlop and Smith & Nephew, Wheeler Fabrications gradually moved into sheetmetal working. Towards the end of the 1990s, the company installed a turret punch press that is still in operation and an Edwards Pearson press brake (now part of Bystronic). A move from a nearby unit into its present premises in 2013 trebled the floor area available for production and provided additional space for installation of the Bysprint Fiber 3015 and other plant.

Today, the highly skilled team provides a broad range of industries with design consultancy followed by comprehensive metal cutting, folding and fabrication services, from prototyping through low volume runs to production quantities. The petrochemical, defence, automotive, food, hygiene, shopfitting, lighting and furniture sectors are among those served. Four-fifths of sheet metal output is folded, indicating that the firm is very much at the high value end of the business.

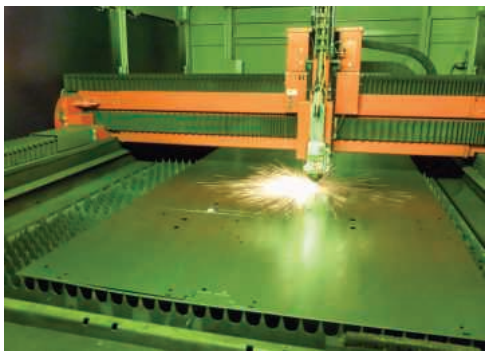
Mark Ashford continues: "We spent 18

The Byloader at Wheeler Fabrications transferring a new sheet onto the shuttle table of the Bystronic fibre laser cutting machine

months researching the market and comparing different fibre laser cutting machines.

"Several potential suppliers were given a trial to productionise a difficult component. Bystronic gave the best response from its technical centre in Coventry and the company has continued to provide good applications support.

"Another point in the Swiss manufacturer's favour was the seamless interaction of the company's Bysoft 7 nesting and 2D programming software not only with its own machine control but also with our Radan 3D modelling CAD/CAM software.



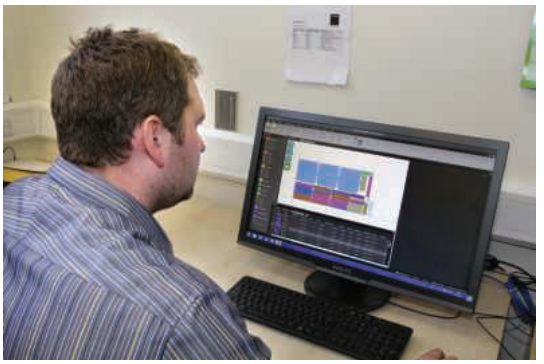
Fibre laser cutting in progress

"Bysoft has an integral seat of SolidWorks CAD, so we could also design components in that environment if we chose to."

An increasing number of Wheeler Fabrication's customers are opting for components to be made out of pre-plated materials, as the finishing services it buys in are becoming more and more expensive. Partly with minimising damage to these materials in mind, and also to avoid the arduous job of physically handling sheets onto the Bystronic machine, the BySprint Fiber machine was supplied with a ByLoader 3015.

At the press of a button, it loads a new sheet onto the machine's shuttle table after the operator has removed the previously cut components and skeleton. The subcontractor often produces 15 jobs from 15 different materials in a day, so efficient handling is important.

Since the fibre laser cutting machine was installed, it has resulted in the subcontractor winning a lot of new business. A 1.5 metre long, 6 mm thick brass grille has just been produced for Birmingham Repertory Theatre, a job that would have been impossible on the $CO_2$ laser.



Mark Ashford, production manager at Wheeler Fabrications, preparing the next job using PC-based Bysoft 7 software

Another recently completed contract that would previously have been uneconomical due to the slowness of the old laser machine was the production of 1,200 electrical cabinets from 1.2 mm thick Zintec in three variants for the construction industry.

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# Mazak gears up with two state-of-the-art laser machines

Yamazaki Mazak is gearing up for Tube Düsseldorf with two state-of-the-art laser cutting machines ideally suited to tube and pipe cutting applications.

The Mazak stand, situated in **Hall 6 Stand E20**, will showcase the company's largest laser 3D cutting machine, the 3D FABRI GEAR 220 II, alongside the SPACE GEAR 510 MK II, an all-in-one 2D/3D laser processing machine.

The 3D FABRI GEAR 220 II is an automatic 3D laser cutting solution specifically designed for long, heavy tube and profile work, often used in the construction industry to create building structures, heating and ventilation systems, and cranes. It has been used in a number of highly prestigious construction projects including the Yas Marina Formula One circuit in Abu Dhabi, the national football stadium in Gdansk, Poland, and the Tokyo Sky Tree, the world's tallest broadcast tower.

The FABRI GEAR cuts a wide variety of tube, including round, square, rectangular and triangular, and is equipped with a unique four chuck design that rigidly holds the workpiece in place during the cutting process.

The laser cutter is equipped with a 3D torch, enabling movement on five different axes, ensuring the accurate cutting of both closed and open profiles. The 3D FABRI GEAR delivers industry-leading levels of accuracy by cutting vertically, which enables the metal tubes to sit flush against each other with no gaps during assembly. This reduces the need for jigs to hold the cut metal in place prior to welding and reduces the amount of weld material, which cuts weld-time. Mazak estimates that tube cut with the 3D FABRI GEAR can be welded and assembled twice as fast as conventionally cut tube.

Alongside the FABRI GEAR, Mazak will be displaying the SPACE GEAR 510 MK II, an all-in-one 2D/3D processing machine which is capable of cutting 2D flat worksheets, 3D workpieces and pipe.

The SPACE GEAR is equipped with six axes and an integrated chuck which enables the cutting of a wide variety of features, such as weld preps and angles, in a single setup. In addition, the laser cutter is equipped with a constant beam length system that provides stable cutting performance.

Outstanding cutting speeds are guaranteed with a cutting feed rate of 15 m/min and rapid traverse rates of 24 m/min in the X-, Y- and Z-axes. The machine can be used on workpiece sizes up to 3,500 mm x 1,525 mm.

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# GPS first in line for fibre laser

In 2015, Dudley-based Generic Punching Systems Ltd became Amada UK launch customers with their ENSIS 3015 AJ. Valuing innovation over everything else, GPS could not wait to invest in Amada's new fibre laser technology.

Already having a history with Amada and over five of their machines, a strong business relationship had long been established between the manufacturers. With this in mind, a multitude of notable projects under his belt and profits hitting over £2 million, director Thomas Bull 'knew the ENSIS 3015 AJ was the right machine to take GPS forward.'

Having sold eight more ENSIS machines in the following months, Amada UK grew confident in the laser's success. The ENSIS had instantly set a new benchmark in cost-efficient processing of sheet metal; its major selling point being a unique Amada-designed oscillator. With just 2 kW of laser output from the unique integrated oscillator, the ENSIS 3015 AJ can manufacture mild steel products that previously required 4 kW of laser power.

The secret behind the new innovation lies in the ability to flexibly modulate the laser beam as a function of sheet thickness, thus delivering efficient profiling operations with reduced power requirements. This is in marked contrast to conventional fibre laser cutting systems that require changing the focus lens in order to cut a range of material thicknesses. One of the initial features that attracted GPS to the ENSIS 3015 AJ was this flexibility:

"Although I don't cut much thick material, I have some long standing customers that I don't want to lose. So with the ENSIS cutting the full range of material, I knew it could only be a good move," says Thomas Bull.

Dramatic savings can be achieved by slashed energy costs and the benefits are not limited to finance: the positive impact that halved laser output has on the environment is hard to match. When used in combination with a high performance automation system such as Amada's ASF 3015 EU tower, the machine offers remarkable results.

Processing times have also been significantly reduced. Designed specifically to deliver high processing of both thick and thin materials, the ENSIS 3015 AJ is complete with a high torque motor and helical rack drive in the X/Y axes, and a carriage with a low centre of gravity. Its cutting range reaches 3000 x 1500 x 100 mm in the X, Y and Z axes, resulting in feed rates of 100 m/min being achievable.

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## £1 m investment in TRUMPF automated laser cutting machine

MTL Advanced, one of the UK's largest metal manufacturing and profiling specialists has invested £1 m in an automated large format $CO_2$ laser cutting machine for its Rotherham facility.

The brand new 6 m x 2.5 m TRUMPF TruLaser 8000 laser was commissioned in December as part of an ongoing investment plan to modernise MTL's machinery line-up and boost productivity. With high speed cutting and reduced energy consumption of up to 40 percent compared to the machine it replaced, the "new generation" large bed laser provides superior contour precision and higher part quality than most other laser cutting machines on the market. The new investment will enable MTL to retain a competitive advantage on large volume production contracts as well as wear resistant, high strength and stainless steel components.

Karl Stewart, commercial director at MTL says: "Our investment in this ground breaking laser cutting machine will enable us to remain at the forefront of our industry, as there are very few companies in the UK with this level of technology in-house."

"Investment in large format cutting machines has been at the core of MTL's past successes, and the new TruLaser 8000 complements our already impressive line-up of large profiling machines nicely. This includes a 20 m x 3.5 m laser, a 12 m x 3 m waterjet machine and a 25 m x 5 m plasma cutting machine, to name but a few."

The laser cutting machine will also be fully equipped with an "Intelligent FMS" (Flexible Manufacturing System). Specifically designed for sheet loading, unloading and part sorting, the system will add an extra layer of automation to MTL's operations. Metal sheets of up to 20 mm thickness and 6000 mm length will be automatically loaded on to the system, as well as moved and stacked cut parts of any shape, kitting them for further use which is perfect for Kanban systems.

The automated material handling system is ideal for MTL's large contracts and batch orders as it is capable of running 24-hour unmanned operations without the need for an operator.

Parent-company WEC Group commercial director, Wayne Wild says: "Lean Manufacturing techniques and Automation are essential to our growth and continuous improvement strategy. We have made several other similar investments in a 640 ton, fully automated robotic press brake as well as 13 robotic welders. The addition of the new sorting technology to our profiling cell is a step forward in the automation of our manufacturing process.

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# Pressbrake investment offers boost to capabilities

For sheet metal subcontractor Accurate Laser Cutting, bending material forms an integral part of its bespoke engineering service.

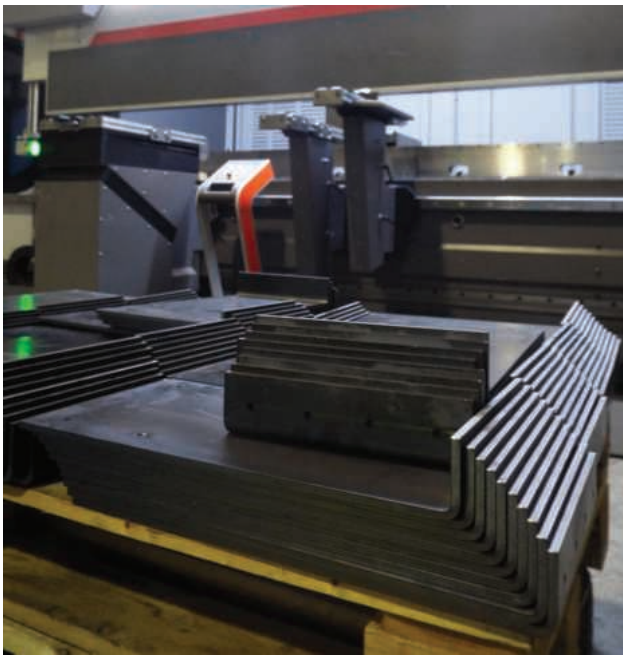
To keep pace with its 4 m x 2 m laser cutting capacity, the West Midlands based firm have invested £500,000 in a dedicated pressbrake and quality check centre. The facility is equipped with a 320 tonne pressbrake capable of bending materials up to 4 metres long. For smaller jobs, they also have a 150 tonne, 3 metre pressbrake.

Director Jon Till says: "The decision was made in 2015 to upgrade our laser cutting and pressbrake equipment, which has provided a much needed boost to our capacity. We now have a complete range of Bystronic machinery; a 6 kW BySprint 4020 fiber laser and two CNC controlled Xpert pressbrakes. Collectively, these provide us with the versatility & flexibility we need to grow as a business and most importantly, meet the increasing demands of our customers."

Customers of Accurate Laser Cutting are now taking full advantage of the firm's dual cutting and forming capabilities more frequently, with the firm witnessing an influx of larger and often more complex types of work. Production manager Neil Tomkins explains: "Our pressbrake centre is equipped to handle materials up to 4 metres long. This, in combination with our 4 m x 2 m flatbed laser is most definitely our competitive advantage and is also beneficial to our customers because we can take care of cutting & folding all under one roof, eliminating the hassle of using multiple subcontractors."

A key feature of the 6 kW fibre laser includes its ability to process thinner sheet materials at unrivalled speeds. It also produces a better quality beam for a more accurate cut across the entire thickness range. It can process aluminium up to 30 mm, copper 12 mm, brass 15 mm and mild and stainless steel up to 25 mm thick. Neil Tomkins says: "The fiber runs up to three times faster than our $CO_2$ laser, with excellent cut quality. It's these phenomenal cutting speeds that allow for extra capacity to be released, resulting in improved rates of production and the shortest lead times possible to our customers."

Service is also of great importance to the laser cutting firm. On average, customer quotations are dealt with in a strict four-hour time frame and subject to capacity, a free next day delivery service is often available. Company director Steve Morgan says: "We do everything we can to meet our customer demands and strive to react to their requirements as quickly as possible." Our premises are open 24/7 making it convenient for customers to collect their orders on evenings and weekends or any other time to suit."



The volume of orders for pressbraking have increased significantly since the new kit was commissioned just under twelve months ago. This also justifies the firm's decision to invest over £60,000 in an advanced range of tooling, offering a wider range of flexibility for customers. Steve Morgan says: "For us, it's all about going that extra mile. In the unlikely event of us not having the required tooling, we are always willing to work with the customer to find a solution that meets their tooling needs." Both pressbrakes are equipped with hydraulic quick change top tooling systems, ensuring rapid setup for economical small batch runs. They cater for anything from one offs and prototype work through to high volume, large batch quantities on a free issue or complete supply basis.

The utilisation of high performance CAD/CAM software BySoft7 & SolidWorks allows for complete integration across their entire range of Bystronic equipment. Improvements to software and offline programming techniques have also streamlined the manufacturing process even further, resulting in greater levels of consistency on finished parts. Jon Till concludes: "Pressbraking is a skilled operation and traditionally, a labour intensive process with the need for extra parts to setup on. With BySoft7 & ByBend, this is no longer the case as we can programme and predetermine any limitations offline, removing the risk of error on the shop floor to allow for greater accuracy and increased rates of productivity."

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# Prima Power puts service first

A major factor in the decision to purchase new machinery is the quality of service available. Prima Power has paid close attention to ensuring that customers get a rapid response in the event of a problem, minimising down time and optimising the return on investment.

In the UK, the company has a team of highly trained specialists. These engineers provide the first line of support and, as well as onsite visits, operate a hotline support service during office hours. Where necessary, the UK team can call on additional resources from other units within the Prima Power Group where particular competences are required. To maintain its high quality service, Prima Power has an ongoing training programme for its engineers to ensure they are fully familiar with new technology and products.

Where possible, Prima Power will dedicate a particular engineer to a customer, which is beneficial in technical terms, facilitates communication and gives the customer confidence in the quality of service. The company also offers a range of service contracts to suit the requirements of each customer. The range of choices available will enable customers to pick the best solution for their particular circumstances.

To manage the service operation, Prima Power has software which records and maintains a history of customer interventions. This system helps the engineers to diagnose faults, share knowledge and feed the information back to the development team. The service department is also responsible for procuring spare parts. These are generally available form stock and can be delivered within one day. Prima Power keeps spares available for 10 years. However, machines frequently have a lifespan of 20 years or more so, for older machines, the company can propose a compatible component or an alternative solution where parts are out of stock. To further speed up spare part delivery, Prima Power is implementing a 24-hour Spare Parts Centre in Belgium. Spares for most product ranges are already located at this new facility and the company will be

gradually increasing the range of products covered by the new centre. Prima Power machinery has an enviable reliability record. To build on this success, it has introduced a new team at its Italian Headquarters which is dedicated to supporting the subsidiaries around the world. Its objective is to provide a communications channel directly to the Product Units and Research and Development.

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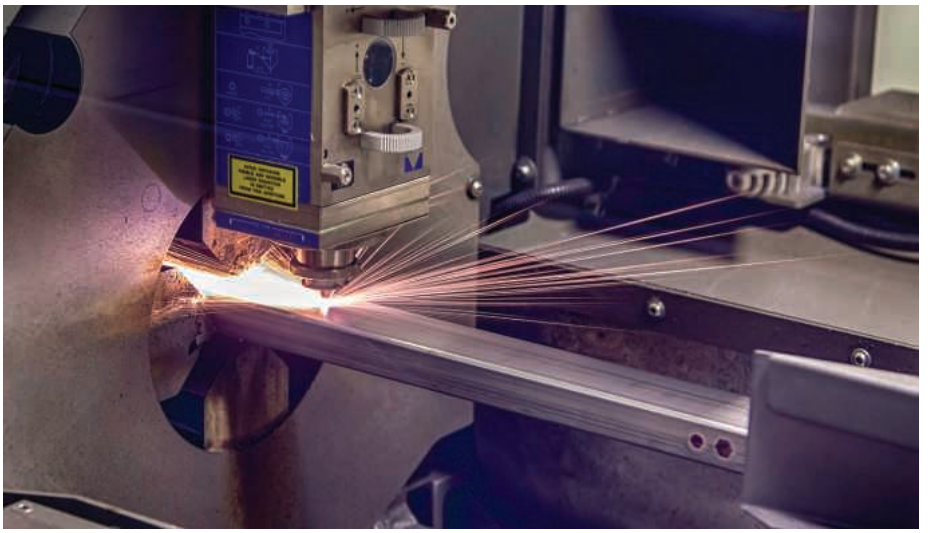
# Tube laser investment doubles productivity at Gratnells

With a history that can be traced back over 125 years, through four generations of the Hudson family, the modern day Gratnells has consolidated its position as a leading supplier of storage, furniture and staging to schools, industry and the medical sectors. The Harlow-based company is now embarking on its next technological leap, using technology from BLM that would have even been beyond the imagination of H G Wells, who published his classic work of science fiction The Time Machine in 1895, the year that Gratnells was founded as W A Hudson.

The decision to install a BLM LT5 Tube Laser machine, the first in the UK, is further revolutionising Gratnell's business to meet the increased demand for its tray storage products from schools, industry and the medical sector, which were being produced using manual machine technology.

"Within a very short space of time of installing the BLM Tube Laser we were seeing productivity doubling. Batches of racking that would previously have taken two people, two days to complete are now being produced, mainly unmanned, in less than a day," says Murray Hudson, Gratnells' managing director. "Not only that, but we are now able to process shapes on tubes that would have been impossible to achieve previously and this has led to innovative new product designs that will have significant impact on the market, The speed at which the BLM LT5 operates has also created extra capacity, which we are able to offer to those in need of quick response for low volume laser cutting."



The BLM LT5 Tube Laser has greatly improved productivity at Gratnells

The arrival of the BLM Laser Tube machine has not only improved productivity, but has also taken the business in directions it hadn't originally envisaged. However, there is one area that is of particular interest, that of motorsport. Murray Hudson's son Rory is among the top 10 Kart racers in the UK and has been selected to be part of the McLaren Performance Academy, in fact he is the only UK driver on the programme at the moment.

"It was the connection between BLM and Tony Kart in Italy, whose karts Rory drives, that sealed our interest in getting the BLM LT5 machine. All of the Tony Kart chassis is cut and bent on BLM machines and having this information has enabled us to work with two universities, manufacturing the chassis for their Formula Student cars. The LT5 is allowing us to achieve multiple angle cuts that in turn create complex joints on these chassis, that we couldn't achieve without the laser. Working in a racing environment breeds quality and while motorsport is just one area that we can see potential for our laser cutting service the potential is huge thanks to the capability of the BLM LT5," says Murray Hudson.

The move from manual slotting and cutting of tubes to the use of the BLM LT5 Tube Laser has been a massive leap forward in technology for Gratnells, but one that is paying dividends, as it now has the capability to quickly, and efficiently, process batches of any size tube, within the machine's range of round tubes up to 120 mm diameter, square up to 100 mm, and rectangular, oval and elliptical semi-flat stock up to 120 x 70 mm. It also has a capability to cut wall thicknesses up to 6 mm


Rory Hudson, one of the UK's leading kart drivers benefitting from the tubular chassis of his Tony Kart that has been manufactured on BLM machines

**The arrival of the BLM LT5 Tube Laser has allowed development of products that would have been impossible to make with traditional equipment**

(mild steel), as well as processing stainless steel, aluminium alloys, copper and brass. For the larger batches of Gratnells own products the BLM LT5 Tube Laser maximises efficiency by use of the automatic tube manipulation that comes with the machine. From loading the raw material to measuring and unloading the finished part, the unloader can also separate, collect and palletise the finished parts, with every operation synchronised by the Siemens 840D control.

This means that the machine is capable of running unmanned for a significant length of time thanks to the reliability of the fiber laser, combined with the large-capacity tube loader. The control is also capable of using the measurements of the tube, and location of the weld seam, to optimise part nesting and reduce waste material. During the entire process from loading to cutting, the tube is fully supported and guided, ensuring maximum accuracy of cut parts and protection of the tube surface. Further efficiency of the BLM LT5 Tube Laser comes in part from its fiber laser that allows a wide variety of materials to be cut, which when combined with the agility of the six digitally-controlled axes and, the speed at which it can be changed from one job to the next. This efficiency and versatility has enhanced Gratnells' production and created other business opportunities, namely offering a sub-contract laser cutting service.

As a result, Gratnells has created a business within a business, namely Gratnells Laser Cutting, to provide laser cutting for small to medium batch quantities with rapid response; typically, the type of work that wouldn't be commercially viable for traditional subcontractors to accept.

"We justified the purchase of the BLM LT5 on the work that it would be undertaking on our products, so any spare capacity that we have available after that is already costed in. This allows us to be very competitive in the subcontract market particularly for short batch runs where the customer needs the work doing in short lead times. We are not looking for large batch work as we do not want to commit the BLM LT5 to extended periods on subcontract work as the main focus remains our own products, but this spare capacity does allow us to provide a niche, bespoke, service for customers," says Richard Picking, Gratnells' international marketing director.

installation of the BLM LT5 Tube Laser machine is just another step in the the125 years of development at Gratnells. The company has constantly evolved , moving from manufacturing metal cornice poles and curtain fittings, cornering the market for television stands in the post war boom years and being one of the first businesses to develop flat pack wardrobes. It was the latter that paved the way for the current business success, as each wardrobe included slotted frames to allow shelving to be positioned. When schools changed their curriculum to include more science experiments by pupils, Gratnells (as it was now known) saw the opportunity and grabbed it. They took the design of the wardrobe shelving system, added standardised plastic trays and the result was that the company became one of the largest suppliers of storage systems to schools. Current production stands at 10,000 plastic trays per day that are shipped worldwide along with their associated shelving.

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# High-specification, low-cost punch press

A servo-electric CNC turret punch press built by Yawei-Nisshinbo has raised productivity dramatically at the Cannock factory of Weldall Architectural Fabrications, a subcontractor best known for its high-end work in the building industry. Supplied by sole agent, Tamworth-based Press & Shear, the machine cost considerably less than equivalent models on the market and was the first of its type to be installed in the UK, following its certification for use in Europe.

Incorporating technology from the world's premium turret punch press manufacturer, Nisshinbo, Yawei turret punch presses are manufactured using high quality components from Japan and Germany. The company produces some 3,000 machine tools per year at its 160,000 m2 facility in Jiangsu Province, China.

Established in May 1988, Weldall is jointly owned by Andy O'Farrell and Alan Blower. The company originally specialised in welding exotic materials such as titanium, nickel alloys and stainless steels for diverse industries including oil, gas, defence, cryogenics, nuclear and medical.

Early work in 1992 centred on producing prototypes for the BR90 project, a family of bridges built from aluminium alloy for the British Army. During this period, the fabricator was subcontracting out its sheet metalworking but decided to bring it in-house, installing its first press brake and guillotine following the acquisition of a supplier.

By the time the BR90 project was phased out in the late 1990s, Weldall had been planning for the transition and had entered the building and architectural sectors. Work in these industries continued side-by-side with other general fabrication projects.

Andy O'Farrell comments: "We are now best known for this work, particularly the manufacture of high quality fabrications, bracketry and aluminium flashings for curtain walling, at competitive prices in short lead-times."

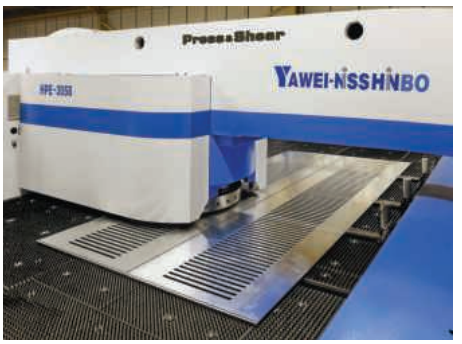
Over the past six years, the founders' sons, Matt O'Farrell, Gareth O'Farrell and Ryan Blower have all joined the company. The family-run firm set about increasing its architectural business, which resulted in a succession of prestigious contracts.

An early success was supplying the builders of Quebec House, a development of 252 one- and two-bedroom units in Kingston-upon-Thames, with 2 mm gauge aluminium pods to finish each of the windows.

Other significant projects undertaken included a weather beater wall for Guy's Hospital in London, new aluminium detail for the upgrade to the pier in Weston-Super-Mare and window feature reveals for the Hilton hotel at Heathrow airport's terminal five.

During this time, Weldall was using a six-station CNC turret punch press. As it was equipped with a manual tool change carousel, a lot of operator intervention was needed and non-productive time was high. The requirements for higher pressworking productivity as well as increased capacity to process sheets longer than 2.5 metres led the subcontractor to look around for a replacement machine.

The Yawei-Nisshinbo HPE-3058 turret punch press installed at Weldall's factory in Cannock



A view from either end of the punch press showing 3 mm thick aluminium sheet being machined for new student residential accommodation at Eastside Locks in Birmingham


Andy O'Farrell continues: "The Yawei-Nisshinbo servo-electric punch press was the obvious choice due to its high specification and competitive price. We have dealt with the UK and Ireland distributor, Press & Shear, for many years and they have always provided excellent after-sales support.

"The use of thick turret tooling means that we will be able to produce accurate components on the machine for many years to come. Additionally, the optional 5 metre length capacity of the brush table is more than enough for our needs, as we have standardised on 4 metre by 1.5 metre sheet."

Since it was installed in November 2014, the Yawei-Nisshinbo HPE-3058 punch press has fulfilled numerous contracts at the Cannock factory. Three sporting venues, the training ground at Chelsea FC and rugby union clubs Leicester Tigers and Northampton Saints, have been refurbished using the subcontractor's components.

A recently completed job was the production of a 12 metre long lion logo for the wall of Birmingham University. It was designed in SolidWorks 3D CAD and produced in sections from 3 mm J57S anodising quality aluminium prior to being anodised and attached to the front of the university building.

Nearly six million 5.5 mm-diameter holes have been punched through 2 mm stainless steel for the production of engine intake louvres to protect military vehicles used in UN peace keeping missions. A special punch and die set was sourced from Wilson Tool complete with the addition of Optima Coating on the punch, which greatly extends tool life by increasing the hardness of the tool to 95 Rockwell.

**Michael Matthews using the quick die change system**

A current project is feature panel manufacture for student accommodation in the Eastside Locks area of central Birmingham, a further on-going job requiring the manufacture of over 1,000 feature grilles from 3 mm aluminium.

The Yawei-Nisshinbo HPE-3048 servo-electric punch press

Weighing 16 tons, the multi-axis CNC machine has a Nisshinbo-manufactured turret with 36 stations for thick turret tooling, although alternative configurations are available. The servo-driven ram has a nominal force of 300 kN, allowing holes up to 88.9 mm to be punched. Turret indexing speed is 30 rpm and Nisshinbo's patented 'Keeping-touch' auto index system is included. The use of wheel-type tools, taps and multi tools is supported.

The brush table accommodates sheet up to 5 metres by 1.5 metres with one reposition, traverse speed being up to 102 m/min. Maximum sheet thicknesses that can be processed are 6.35 mm for carbon steel, 4 mm for stainless steel. Hit rate is up to 1,500 strokes per minute and accuracy of punched features is ± 0.1 mm.

Standard equipment includes a Siemens CNC control, brush tables, three work clamps and soft punch. Options such as multi tools and a load/unload system are also available.

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# Tips from Gasparini

## No.1: 10 ways to avoid scratches and dents when forming stainless steel

By Alvise Crozzolin, area manager, Gasparini Industries

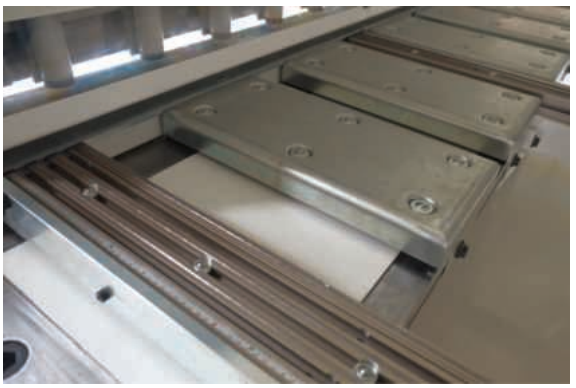
Stainless steel is a wonderful material; shiny, resistant, durable. But it's also expensive, difficult to bend, and easy to scratch. When working pieces that will be used as cladding, home appliances, and furniture, even a small scratch becomes a big problem. How can you cut and bend stainless steel without damage?

Shearing is often the first critical point. A bench equipped with plastic ball transfers, that let sheet metal to slide freely, is highly recommended. When the blank is cut, it has to be pressed against the bench to hold it in place. This system has a downside: pressure against balls leaves dents. Top manufacturers provide an anti-scratch system, with ball transfers mounted on a pneumatic support that lets them disappear below the resting surface.

Pressure of blank holders must also be adjustable. Smaller and thinner pieces require a lower force, otherwise cylinders will leave marks on the surface. Quality machines are equipped with a CNC able to vary the applied force through an independent hydraulic circuit. Also, cylinder feet must be capped with anti-scratch plastic material. Nylon is typically used because of its low coefficient of friction. Pistons must also be absolutely tight to avoid oil or grease leaks that might stain the sheet.

After shearing, forming comes into play. Most frequent cosmetic damages in this phase are due to sheet metal scraping against the die edges. To limit this problem, you have to use special dies, with a bigger edge radius. Another more expensive solution is to use dies with rollers. Small cylinders are embedded at the edges of the die opening. These pins can rotate, reducing friction and scraping. This type of tools must be kept particularly clean, so that dirt does not block the rollers. Specific protective plastic films can be applied to the die to limit scratching, but they may also lead to lower accuracy.

Speaking of tools, it's important to choose a punch/die pair suitable to the sheet metal, its thickness and the desired angle. High-strength steels have a bigger bending radius and need a bigger die opening. Else, it could crack on the outer edge, damaging both the aspect and the resistance. Tools must always be oiled to reduce friction, and kept clean from debris, dust, dirt, rust, chips and other material that can scratch the surface.



Stainless steel sheets are often large and thin. If they are not properly supported during metal forming, they curve under their own weight making the so-called "counterbend" around the die. Sheet followers solve this problem. They are front supports equipped with ball transfers that, during the bending phase and when the ram is raised, support the sheet. As well as rotating, they also have to shift because the centre of rotation is not fixed. Top quality press brakes are equipped with retractable supports next to back gauges. In certain cases, sheet followers can be mounted also in the inner side of the press brake. These accessories support the sheet while it's resting against the back gauges, avoiding deformation.

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# LVD introduces new design PPEC series press brakes

LVD Company nv has announced a new generation of its PPEC series hydraulic press brakes. PPEC models up to 350 tons now feature a new modern and ergonomic design with integrated status lighting. In addition, the touch control for all PPEC machines, ranging from 35 to 640 ton, has been upgraded to LVD's latest graphical icon driven TOUCH-B controller.

**Ergonomic design**

The new design with built-in status lighting gives the PPEC an elegant appearance in line with the Easy-Form® press brakes. The status LED lights indicate the machine's operation status, enabling more effective shop management for higher throughput. An optional LED lighting system illuminates the back gauge and front work zone areas to provide better operator visibility.

**Intuitive touch-screen control**

The touch control has been upgraded from the CADMAN® Lite control to the full-featured, icon driven TOUCH-B control. Working with TOUCH-B is easy and intuitive, no matter the skill level of the operator. With minimal input he can create and simulate 3D-designs on a 19" touch screen. Additionally the controller is compatible with LVD's offline bending software CADMAN-B.

Press brakes equipped with the TOUCH-B control also feature a jog button on the foot pedal, allowing the operator to 'jog' individual axes of the machine for fine adjustments.


The LVD Group is a leading manufacturer of a comprehensive range of sheet metalworking machines and software solutions. The laser cutting systems, punching machines, press brakes, guillotine shears and automation systems are integrated with our own custom developed CADMAN software. The company has production facilities in Belgium, France, the US, Slovakia and China and sales and service offices in more than 45 countries worldwide.

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# New dedicated website for SteelBeast range

Specialist metalworking solutions manufacturer, JEI Solutions has launched a new dedicated website for its expanding SteelBeast® range of distinctive steel fabricating equipment.

With over 20 years of industry expertise, JEI Solutions is widely recognised for the premium quality and performance of its flagship MagBeast range of portable drilling machines.

JEI has developed its new SteelBeast website **www.steelbeast.co.uk** to raise awareness and support the growth of its expanding portfolio of further metal fabrication solutions including the SteelBeast range of portable plate and pipe bevelling machines for creating a perfect weld ready edge prior to weld joining. The responsive design of the new SteelBeast site enables customers to view technical information about the entire range from any computer or mobile device.

Built to cover all aspects of steel work, SteelBeast provides solutions for a wide range of industries and challenging applications. In addition to an extensive selection of bevelling machines, the SteelBeast range also includes welding and cutting carriages, rotary welding positioners, as well as industrial sawing, grinding and punching machines for cutting and creating holes in steel.

"Growing our SteelBeast range reinforces JEI's commitment to becoming the UK's leading one-stop solutions provider for diverse metal drilling and fabricating requirements," says David McFadden, founder and managing director of JEI Solutions.

"Whatever the application and no matter how challenging, we are confident that SteelBeast will have the right answer."

Like all JEI products, SteelBeast machines are manufactured to the highest standards and are rigorously tested to ensure maximum durability, simplicity of use, precision and reliability.

Through successful partnerships with JEI's global distribution network, SteelBeast products are now used and serviced in over 30 countries world-wide, in varied industries ranging from construction, civil engineering and maintenance to heavy plant manufacturing and shipbuilding.

JEI Solutions is a British company that has evolved from Jancy Engineering Industrial, originally formed in 1993. The business, which has its headquarters in Rawtenstall in Lancashire, now boasts a high calibre of excellence as a one-stop solutions provider, supporting diverse metal drilling and fabricating industries. JEI's products are now used in over 30 countries worldwide, supported by a network of global distribution partners who serve a diverse range of industry sectors.

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# A good time for UK exporters to invest

Ernst Wagner, managing director of KASTO Ltd, the sawing system and automated storage and retrieval system supplier, looks back at the last business year with satisfaction. Sawing machine sales were 25 percent up on 2014, while two customers made strategic capital investments in automated warehousing systems, totalling £5 million, whereas in recent years only one was sold per year.

Looking ahead to 2016, while there are various negatives currently in global finance and oil, there is also good news for UK manufacturers that export due to the pound having weakened against the Euro and other currencies. It means that goods are less expensive for overseas customers and are therefore easier to sell abroad.

According to a recent report, only around one-fifth of UK manufacturing businesses export, a figure that Ernst Wagner thinks should be higher. For this reason, he believes it is a good time for British manufacturers to keep investing in modernising its machine tool stock and in-house logistics procedures.

Ernst Wagner says: "2015 was the year of the KASTOwin, our series-built, modular bandsaw range launched in May 2014 that has dramatically lowered the price point for high quality sawing equipment. Our German parent company has enjoyed considerable success selling these machines around the world and this has been mirrored in the UK, including unexpected sales made directly from our Milton Keynes showroom during open house events.

"The largest capacity KASTOwin bandsaws that we have sold so far are for cutting 560 mm stock, but at the turn of the year we had serious enquiries for the next larger model in the range, an A8.6, capable of cutting 860 mm bar. The largest model is a 1,060 mm capacity A10.6 and interest in these larger machines is definitely growing.


"At the end of September last year, a new model called KASTOwin Tube A 5.0 was launched, on which the blade cuts from the bottom upwards, the reverse of the action on other bandsaws. A demonstration model arrived in our Milton Keynes showroom towards the end of January 2016. It reduces wear on the band and avoids damage to its teeth that often occurs when a blade travels downwards into swarf that has accumulated inside the bottom of the tube."

Until now, this problem made it virtually impossible to use a tungsten carbide tipped (TCT) blade for sawing tube efficiently, as the teeth were invariably damaged. A bimetal blade was the only option. This is a thing of the past with the KASTOwin tube, on which TCT blades may be used to raise productivity without fear of premature wear.

While KASTOwin was the star product of the year, sales of other types of saw also contributed to the strong sales performance. Top-end KASTOtec models remain popular for higher volume cutting, particularly of tough alloys. The company's workshop range of smaller band, circular and hack saws also contributed well to the overall financial performance.

Once again, 2015 saw the sale of a WAM9 production circular sawing machine, this time to a customer in Willenhall for sawing aluminium billet, which they form and press for the automotive supply chain.

Two important exhibitions will take place in the UK this year, each of which addresses the two key areas of KASTO's business, sawing and storage.

First will be the machine tool show, MACH 2016, to be held at the NEC, Birmingham from 11th to 15th April. On its stand the company will show a representative model from the KASTOwin range as well as the dedicated tube saw, a KASTOtec with the company's KPC performance cutting package ideal for high volume cutting applications using tungsten carbide tipped blades, and various models from the workshop range.

Later in the year, from 13th to 16th September at the same venue, Kasto will exhibit at the three-yearly IMHX exhibition. It will provide the perfect opportunity to showcase the company's extensive range of high-rise, computer-controlled warehousing and automated materials handling systems for storing long stock such as bar and tube, sheet metal and other flat materials, pallets, stillages and much else.

It is this side of the business that Ernst Wagner is convinced has the best potential for growth within KASTO Ltd.

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# Cutting steel at record speed

Key industries operating in the world economy require large quantities of case-hardened and heat-treated steel at ever more frequent intervals. Forging plants have adjusted to the increased demand, and there is pressure on machine manufacturers to offer plants enabling the economical machining of this type of material. Behringer GmbH has been stepping up to this challenge for a number of years already, and has revolutionised the world of bandsawing in terms of cutting output, saw blade life and material savings with its Speed Cutting Technology (SC Technology).


CEO Christian Behringer says: "Speed Cutting Technology represents a quantum leap in sawing technology" It is the culmination of a successful symbiosis of innovative machine technology and newly developed tools, and is setting whole new standards in terms of speed. It uses extremely thin standard saw blades just 1.1 mm in thickness and 67 mm in height. The minimal thickness of the saw band reduces the cutting forces required per tooth, and the significantly narrower kerf channel saves material. This material saving has a major impact particularly in comparison to conventional large-scale circular sawing plants.

The pivotal issue in any high-performance machining operation is the stability of the overall machine. This is why Behringer produces all the essential components using vibration-absorbing grey cast iron. By using servo technology to control the saw's infeed, not only is an even stock removal process guaranteed during machining, but also the highly precise cutting pressure control helps prevent the blade from overloading.

Economical operation hinges largely on the service life of the tool. Special band guides and a suitable coolant feed system make a significant difference here, meaning that speed and cost-efficiency are no longer contradictory objectives. Impressive proof of the key improvements made in this field are cutting output levels and saw blade service lives which would have been inconceivable up until only recently.

An optimised chip cleaning system efficiently transports the higher number of chips occurring during high-performance sawing out of the cutting area in the chip conveyor located in the machine bed. Utilising the full potential offered by SC technology imposes stringent demands on the machine concept, in particular the degree of automation. Behringer supplies individually tailored solutions to address this need.

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# Doubling Dutemänn's door making capabilities

A new Mecal CNC machining centre and a Tronzadoras semi-automatic saw, both from cutting technology specialists Addison Saws, are set to double the production capabilities at Dutemänn UK Ltd's brand new manufacturing centre in Northfleet, Kent.

**Exceptional quality doors**

Dutemänn has built its reputation around designing and building exceptional quality, German-engineered aluminium bi-fold doors, inline sliding doors and entrance doors. Production director, Steve Prudence says: "When we took the decision to move to a new 16,000 sq ft showroom and manufacturing centre, it was imperative that all new production machinery delivered the same uncompromising levels of precision that our nationwide customer base has come to expect,"

**A proven investment**

When Dutemänn first opened in Dartford in 2010, the organisation invested in a Mecal MC 309 Nike 3+1 axis CNC machining centre from Addison Saws, as well as a Tronzadoras semi-automatic saw. "At the time, we spoke to a number of technology providers before deciding on which machining centre to purchase," adds Steve Prudence. "It was only Addison, however, that seemed genuinely in tune with our requirements."

**Bluetooth wand measuring system**

For its new facility, Dutemänn has purchased a further Mecal MC 309 Nike CNC machining centre and a Tronzadoras TLG 352A semi-automatic rising blade aluminium sawing machine which will be used to cut extrusion bars to length.

The Tronzadoras TLG 352A is equipped with a six-metre in-feed roller and two MPS-powered length stops which incorporate Bluetooth 'wand' measuring capabilities. The measuring system provides fast, accurate measuring of components, supported by rapid Bluetooth data transfer to the length stops for greater productivity, reduced operator errors and minimal scrap. By investing in the new machines, Dutemänn has been able to create two parallel manufacturing lines, with the line which comprises of the new equipment also benefitting from the enhanced measuring capabilities of the Bluetooth wand system.

Steve Prudence says: "It seemed only sensible to specify our new Tronzadoras saw with the latest measuring capabilities. Although human error in component measuring has rarely been an issue in our production schedules, the length stops remove any necessity for operator involvement in the measuring process and have increased production significantly.

"The measuring wand capability provides our operators with a quick and easy way to accurately measure inside frame dimensions and then instantly send that data or, indeed, numerous profile length measurements to the powered end stops via Bluetooth. The entire system is surprisingly simple to use and highly effective."

**Meeting customer demands**

With dual production capabilities, Dutemänn is now easily able to adjust manufacturing (without compromising on their usual high quality standards) to meet customer demands. Typically, weekly production slots comprise of around 150 units, made up of bi-fold panels, Glide-S sliding doors, Haus doors and the newly launched Haus Tür door complete door sets. Haus door heights range from 1.8 to 2.4 metres high, Glide-S are up to 3.2 metres high, while bi-fold panels have been up to 3.6 metres high.

**Automatically drill, mill, slot and prep**

Both of the company's Mecal MC 309 Nike machines are equipped to automatically drill, mill, slot and prep aluminium extrusion bars of typically 6.5 metres in length. As standard, Mecal MC 309 Nike machines are equipped with four pneumatic clamps on the mobile beam and can be positioned at any angle between +90° and -90°. For even greater stability in securing parts that are to be machined, Dutemänn specified six clamps. This has also enabled the working bed to be effectively split in half to allow two parts to be machined at a time. The material to be machined can be automatically rotated between +/- 90° and manually set at any intermediate angle between, by way of the end stops.

This year Addison Saws celebrates 60 years at the forefront of sawing technology. Established in 1956, Addison Saws brought a new breed of metal cutting solutions to the UK and, in doing so, created a whole new market for bandsaws and circular saws. Today, 60 years on, Addison Saws continues to lead the way in metal cutting technologies and offers an extensive range of full CNC machine tools, from the world's premier industrial machine manufacturers

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# Increase production with bespoke saw feeding system

As an importer and distributor of steel pipes and their complementary fittings, International Tube and Fittings (ITF) will soon be celebrating its 10th anniversary, supplying steel pipes and fittings to the fire protection industry for use in sprinkler systems, as well as the mechanical heating, ventilation and plumbing industries and even for use as handrailing.

Located in Wednesbury, in the heart of the West Midlands "Black Country" the company occupies a huge 51,000 sq ft warehouse which ensures that the capacity and range of products held in stock are always available to its customers.

Cutting stock pipes to length is an important part of the business of being a stockholder and ITF satisfied this requirement in their early days with the purchase of a horizontal bandsaw from Prosaw.

The bandsaw was originally configured to saw the tubes to length individually, but as business increased, capacity became critical and the decision to upgrade the facility became crucial.

In order to increase the capacity of the existing sawing facility, Prosaw designed a system that would be capable of sawing the tubes in bundles instead of sawing them individually. This was achieved by designing special purpose clamps to hold complete bundles of tubes during the cutting process. The clamps, which are interchangeable depending on the size of the bundle, hold each bundle firmly during cutting.

Since a bundle of 1/2" diameter tubes contain 169 separate tubes, all of which are cut simultaneously, the resulting time savings are spectacular.

Joint managing director Rosemary Slater says: "We are obviously delighted with the resulting system and we found Prosaw's approach to our problem was both flexible and solution oriented. They gave us lots of help and assistance in setting the new system up, especially in terms of feeds and speeds, as well as making sure that the blade life was optimised."

Since its formation in 1963 Prosaw has specialised in all aspects of metal sawing and is today accepted as one of the UK's leading suppliers of metal sawing machinery and associated material handling and measuring systems.

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# Laser welding helps growth

Chesterfield-based Peak Sensors has recently invested in the latest laser welding machine from Rofin-Baasel UK. The new installation will boost the already high standard of temperature sensors made by Peak Sensors.

Peak Sensors manufactures custom built temperature sensors, delivering Resistance Temperature Detectors (RTDs) and Mineral Insulated (MI) thermocouple assemblies to a wide variety of industries, with customers all over the world. From small sensors measuring the temperature of drugs delivered by anaesthetic machines to large robust sensors for measuring the temperature of molten glass.

Peter Smith managing director of Peak Sensors receives training on the ROFIN Performance laser welder from Stuart Townsend

The investment will ensure that production capabilities at Peak Sensors continue to match the expectations and growth of its customer base. Although some traditional industries are quiet, there is a surge in demand within areas such as green energy.

The advantage laser welding brings over existing methods is the capability to produce thin and small weld seams with minimal heat-affected zones. The laser welder will not only partly replace existing operations such as brazing, TIG welding and plasma welding but also add new capabilities. Peak Sensors will be able to easily weld thin wall tubes, and MI sensors will be able to be welded in longer lengths. The length of MI thermocouples and RTDs Peak Sensors are able to manufacture is now practically limitless. Modifications to the laser welder's standard configuration will make the welds needed for the production of thermocouples and resistance thermometers even easier.

The laser welding system is the Rofin Performance which combines a sophisticated control system with manual operation allowing precise location and repeatable results for spot or seam welds, positioned manually under a 16 x microscope. The Performance has become the benchmark for precision manual laser welding in the electronics, jewellery and medical device industries around the world.

Managing director Peter Smith sees substantial growth for the business as a result of introducing laser welding into the production of assemblies at Peak Sensors. Peter Smith says: "The laser welder allows us to reduce costs while increasing capacity. The improvement in product quality will give us significant commercial advantage. A laser weld creates a smaller heat affected zone, at critical points in sensor manufacturing. This will extend product life and reduce long term sensor drift."

The laser welder has only been installed for a number of weeks but it is already in full use and generating significant savings over previous methods. Peter Smith says: "Welding mineral insulated cable has never been easier. We are able to produce very clean, small welds much quicker than before."

Another advantage that laser welding brings is in temperature sensors for the food and beverage market. Laser welding produces very clean welds to make the sensors as hygienic as possible. Also the process does not require any foreign materials to be used such as fluxes or fillers.

Rofin-Baasel UK has been supplying laser welding, cutting and marking systems into the UK and Ireland from its office in Daventry since 1995. With 28 employees in Daventry, and three in the Republic of Ireland, the company is well-placed to offer local sales, application, and technical assistance. A comprehensive stock of spare parts and consumables is also readily available to support customers with rapid response.

Established in 1997, Peak Sensors has developed a reputation as temperature sensor experts. Small companies and large brands from all over the world come to Peak Sensors for its extensive knowledge of temperature sensor design and product quality.

Peak Sensors' team of highly-qualified experts has many decades of experience in designing solutions to meet clients' exact needs. Service is prompt, personal and professional. The company recognises that the sensors they supply are critical to the smooth and cost-effective operation of customers' manufacturing processes. The sensors are designed to operate reliably under the harshest of conditions, supported by swift supply of high-quality replacement components as needed. The sensors are produced using top-quality components sourced from leading industry-recognised suppliers in Europe and the United States. Peak Sensors' rigorous quality standards are reflected in its ISO 9001 accreditation.

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# Laser welding and cutting with highest precision

Precise, quick and reliable. The use of laser beams in welding and cutting technology offers many advantages. CLOOS has introduced the QIROX Laser Cell, a new product line of compact cells for automated laser cutting and welding.

The demands on productivity, repeatability and quality are continuously increasing in industrial production. This has to be met by the welding and cutting technology, too. Modern welding technologies allow increasing quality, productivity and efficiency of the complete production process. The importance of laser welding and cutting in particular will grow in the future. The main reason for this is the high efficiency and accuracy of the laser beam. Laser welding and cutting often allows a much higher process speed with, at the same time, a better quality than with conventional processes. The exact work with a precise heat input minimises the heat affection and thus the thermal distortion. This reduces any time-consuming rework to a minimum.

With the QIROX Laser Cell CLOOS comes an extensive range of laser cells for maximum efficiency and quality. Each laser cell system is a tailor-made unit with components which match each other perfectly. They do not require much space and can be easily integrated into any production. The turnkey systems consist of a laser welding head, safety equipment, operating terminal, positioner, QIROX robot, flat screen with HD camera for visualisation and a pre-assembled media room.


The laser cells are equipped with a high-tech diode laser offering maximum electrical efficiency. Other features of this laser type include high availability, low maintenance expenditure, easy operation and an excellent process stability.

The 2-station systems are available with different types of positioners for different workpieces and can be loaded from the outside. At one end employees can remove the welded workpieces, check the quality of the welding and reload the system while the welding process takes place at the other end. This results in an enormous time saving for the whole process.

Since 1919, Carl Cloos Schweisstechnik GmbH has been recognised as one of the leading companies in welding technology. With around 750 employees worldwide the company provides production solutions in welding and robot technology for industries such as construction machinery, railway vehicles, automotive and agricultural industry.

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# Improving production in welding and fabrication

FastRotator is an innovative machine that provides production improvements in the welding and fabrication process by its smooth, easily controlled and rapid rotation of workpieces, which reduces the waiting time for overhead cranes or forklift trucks when turning or handling components.

When FLI Structures, a leading UK manufacturer of tower structures and screw pile foundations, expanded production from its original factory into another facility with a low roof, they were unable to install an overhead crane. The rotation of every fabricated tower structure therefore required the use of a forklift truck to turn each workpiece up to five to six times before welding could be completed at each welding workstation.

Now the new fast rotators saves up to two hours per unit as the welder now has individual control of the turning process so that each workpiece can be rotated in a precise and controlled way to ensure the welding and fabrication work is a far more continuous process, which massively reduces downtime and maximises productivity. The forklift truck is now only required for loading and unloading operations. The FastRotators also made the welders job much safer as turning large items with a crane or Forklift is not ideal and therefore exposure to this risk was actually greatly reduced or totally eradicated.

The company has purchased a total of 10 FastRotators and are delighted with the improved productivity and cost savings that are achievable resulting in a rapid return on investment.

Andy James, FLI works manager, says: "We have used these rotators on a number projects since purchasing them but the major one would be the supply of gantry steel to Network Rail's OLE (Overhead Line Electrification) project. These particular structures can be up to 25 metres in length and weigh up to six tonnes, so the Rotators have been a great asset in helping us to reduce production times to meet the delivery deadlines involved."

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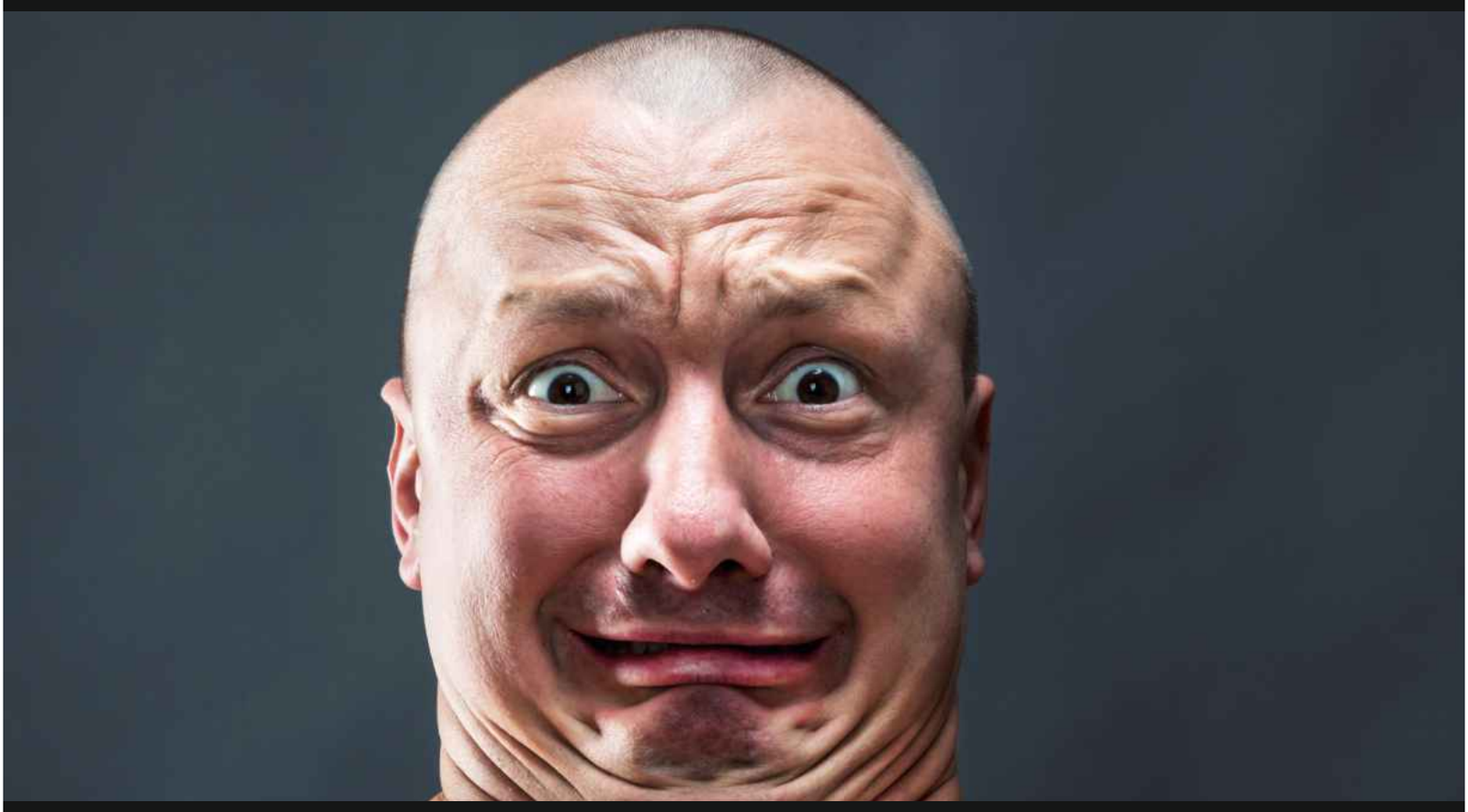

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