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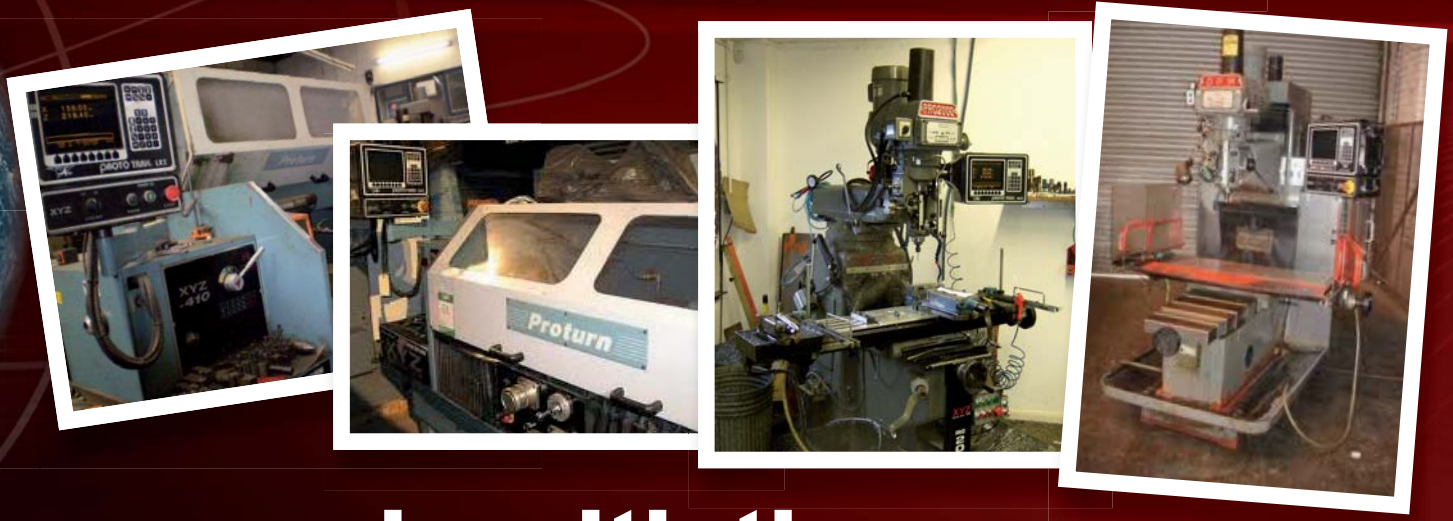

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Publisher: Roger Barber
Email: roger@rbpublishing.co.uk

Assistant editor: John Barber - 01403 242803
Email: john@rbpublishing.co.uk

Accounts: Jackie Barber - 01403 563791

Production manager: Anna Rodrigues - 01472 210712
Email: studio@rbpublishing.co.uk

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Hurco's successful 2015 ends with busy Open House

Orders for 10 vertical machining centres and CNC lathes to the value of £635,000 were taken by Hurco Europe at its three-day open house in High Wycombe in December 2015, during which it welcomed 91 engineers from 67 manufacturing companies. Around 40 percent of the visitors and a similar proportion of sales came from firms that were new to Hurco.

Diverse industries were represented by the people attending, indicating the universal appeal of the manufacturer's products within the OEM and subcontracting sectors. Automotive and aerospace are areas of continuing sales growth, while the mould and die industry is also buying an increasing number of machines due to more and more work being re-shored.

Managing director David Waghorn says: "Nearly one-third of our unit sales last year were relatively low cost CNC turning centres, but these were offset by healthy deliveries of our larger DCX twin-column, bridge-type machining centres and also of higher value 5-axis vertical machining centres."

Another reason behind the good financial result was the sale of four German-built Roeders 3/5-axis machining centres to British and Irish manufacturers, under a sole agency agreement that dates back more than a decade. Hallmarks of the machines are linear motors in X, Y and Z, direct drives for the rotary axes, high spindle speeds and exceptional levels of profiling accuracy and surface finish. Additionally, jig grinding at 90,000 rpm is now an option on virtually all models in the Roeders machining centre range.

David Waghorn continues: "To ensure we keep pace with the ever increasing need for after-sales support to match the growing installed base of Hurco machines in the UK and Ireland, we recruited three more service engineers during 2015. In addition, we appointed a new third-party service organisation in Ireland, DWS Facility Services. We hope that they will provide a similar level of support to that currently supplied to our Scottish customers by Caldervale Machine Tool Engineers."

No new machines were exhibited at the open house, but visitors to MACH 2016 can expect to see something new from Hurco in Hall 5 Stand 5330. It was noticeable that nearly all of the machining centres at High Wycombe were fitted with Hurco's latest Max 5 control system, which will make its national debut at the Birmingham show next April.

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Motorsport - a perfect fit with XYZ Machine Tools

XYZ Machine Tool's long association with the motorsport sector will be emphasised during its attendance at the Autosport Engineering show from 14-15 January at the NEC, Birmingham. XYZ's range of machine tools, including the ProtoTRAK controlled mills and lathes, through machining centres and turning centres and the innovative 2-OP portable vertical machining centre are ideal partners for the motorsport sector, where the low-volume manufacturing and high pressure lead time demands are key drivers.

Machines on display will include the SMX 3500 bed mill and SLX 355 ProTURN lathe, both featuring XYZ's unique ProtoTRAK control that simplifies programming of complex parts and ensures that parts are machined quickly and efficiently. Machining centres and turning centres will be represented by the XYZ 710 VMC and Compact Turn CT 52 lathe. Both of these

machines are constructed using solid Meehanite castings that create a substantial machining platform that is combined with agile axis movements and powerful spindles to handle a wide variety of components.

The final machine on display is the XYZ 2-OP, which is taking versatility to new levels. The XYZ 2-OP is a fully portable and highly capable vertical machining centre that brings cellular manufacturing to lower-volume environments. The machine's impressive specification, for its size, can be used to simply add to existing machining centre capacity.

"The XYZ 2-OP has really caught the imagination of small to medium-sized engineering businesses thanks to its very small footprint and also its capability for maximising available manpower and freeing

up more expensive spindles within a machine shop," says Nigel Atherton, managing director, XYZ Machine Tools.

The XYZ 2-OP has axis travels of 355 mm by 305 mm by 455 mm (xyz), with a table size of 457 mm x 381 mm, with a maximum table load of 250 kg, rapid traverse on its hardened box slideways is 15 m/min in all axes. Performance is enhanced by the use of a 3 hp (50–6000 revs/min) BT30 spindle that is supported by an eight-position toochanger. All of this sits within a footprint of just 1220 mm by 760 mm, and weight of just 1100 kg. This compact size means that the XYZ 2-OP can be located where it is needed, when it is needed.

XYZ's customers in the motorsport sector range from suppliers of components through to highly successful race teams, who are using XYZ machines to produce components ranging from fuel delivery systems, through racing transmissions to engine blocks and cylinders. These are just

some of the comments from existing XYZ Machine users operating in the motorsport sector: "Having in-house machining with these XYZ machines gives us much more control over design and manufacture. We are now in a much better position to modify designs, to further reduce weight, or simply experiment with new ideas, as we now have the capacity to do it, without the expense or reliance on external sources."

"Almost every part we make goes through the XYZ VMCs including gears, where we reduce weight by milling pockets, and gear shafts where we drill cross-holes. However, the bulk of the work they are used for is billet machined items such as dry sumps, clutch baskets and slave cylinders. All of which tend to be in batch sizes of 10 -15 off, so the versatility and ease of setup of the XYZ machines plays a major role in our productivity."

"The new XYZ Compact Turn 52 is playing an important role in allowing us to manage this growing customer demand and also the development of new products."

"Thanks to the confidence we have gained through the combination of high quality machine tools, with the back-up of applications and service teams from XYZ, we now have the confidence to further develop the plans we have for manufacturing."

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EOS enters a three-year technical partnership with Williams

Additive manufacturing system manufacturer and high-end solution provider, EOS has announced that it has entered a three-year technical partnership with Williams Grand Prix Engineering and Williams Advanced Engineering. The partnership aims at providing Williams with direct and high level insights into the latest AM technologies offered by EOS to complement its existing manufacturing processes and to support its own AM development project. At the same time, both companies will jointly demonstrate AM within the world of Formula One.

Williams already owns two polymer EOS systems. As its standard production materials, the company uses Alumide and Carbonmide from EOS. Alumide predominantly creates stable parts for functional testing, ranging from engine ancillaries and complete gearbox assemblies for mock-ups to jigs and fixtures for laminate production. Carbonmide at Williams is used for production parts on Formula One cars in conjunction with carbon composite laminates where improved strength is required.

As part of the current agreement, Williams has just installed an EOSINT P 760, a highly productive, modular plastic AM system with a large building volume of 700 mm x 380 mm x 580 mm that offers expanded productivity and increased part sizes when manufacturing polymer parts.

Stuart Jackson, regional manager at EOS for the UK adds: "The partnership will allow EOS and Williams to jointly expose selected customers to the world of Formula One, with the aim of illustrating the use of AM in this technically advanced industry. Through its Williams Advanced Engineering business, Williams provides technical innovation that transfers Formula One technology solutions focusing on sustainability and energy efficiency to mainstream industries such as automotive, motorsport, transport, energy and other sectors. As such, the partnership is a perfect fit for us as we truly believe that all parties involved will benefit highly from this interchange of ideas."

Speaking about the collaboration, Brian Campbell, production manager, Composites and ADM at Williams, adds: "At its core, Williams is a racing team but has many facets to its business in which opportunities for AM applications reside. EOS can help us to turn these opportunities into performance. This partnership also holds a lot of synergies, as both companies are family-owned and independent, at the same time driven by guiding principles such as innovation, teamwork and excellence."

Stuart Jackson (left), Regional Manager EOS UK with Richard Brady, Advanced Digital Manufacturing Leader, WilliamsF1 in front of the EOSINT P 760 system (Source: EOS)

Founded in 1989, EOS is a global technology and quality leader for high-end Additive Manufacturing (AM) solutions. As the leading pioneer of Direct Metal Laser Sintering (DMLS™) technology, EOS also provides a unique polymer AM portfolio. For these industrial 3D Printing processes, EOS offers a modular solution portfolio including systems, software, materials, technical and consulting services. EOS is the partner of choice for industrial AM production, enabling sustainable solutions for the industry. Customers utilising EOS AM solutions gain many benefits from the paradigm-shifting technology: lightweight structures, cost reduction based on functional integration, individualisation as well as accelerated product development and production.

Innovative, tool-less EOS Additive Manufacturing provides a new approach to tackling the current challenges facing the automotive industry. It offers maximum design freedom while allowing the creation of complex yet light components with high levels of rigidity.

Additive Manufacturing enables the production of components with integrated functionality, without the need for tools,

One of the WilliamsF1 race cars in the Brazilian Grand Prix 2015. (Source: Glenn Dunbar / LAT Photographic)

thereby cutting development and production costs. What is more, suppliers can respond to customer requirements by offering individualised serial production of parts.

Rapid prototyping based on Additive Manufacturing also means automobile manufacturers can increase the efficiency of their research and development processes, enabling them to get their products on the market more quickly. The focus here is not just on geometrical part accuracy: EOS is continuously expanding its range of new materials in order to ensure that parts are functionally reproducible, too, and can be installed directly in serial production vehicles.

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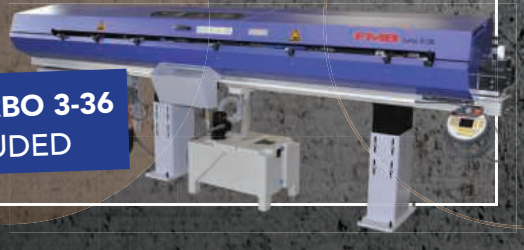

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Giving motorsport better machining performance at Autosport 2016

At Autosport 2016, OPEN MIND Technologies will be giving its UK exhibition debut to its latest CAM development, hyperMILL Version 2016.1. hyperMILL 2016.1 recently received its world premiere at the EMO Show in Milan where it caused quite a frenzy, and on **stand E1071** at Autosport, UK Motorsport manufacturers will get a taste of how it can improve machining performance.

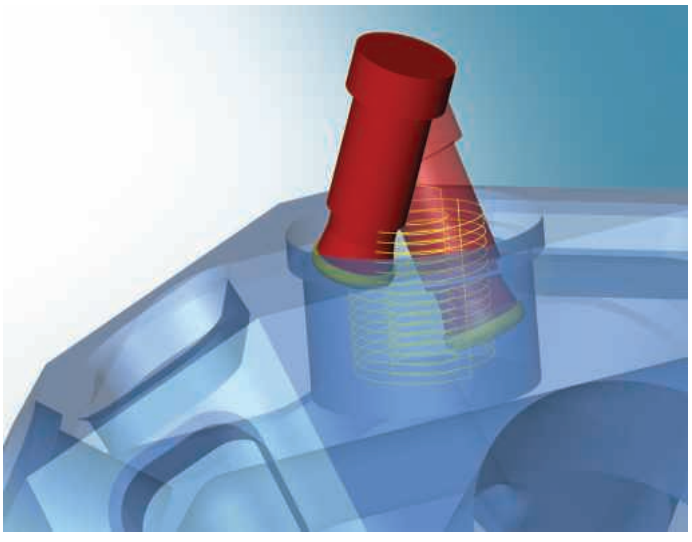
OPEN MIND Technologies CAM software is already a leading CAM/CAD solution with seats installed at the majority of F1 teams and throughout their supply chain. The Autosport show at the Birmingham NEC from the 14th to 15th of January 2016 will give the industry benchmark CAM vendor an opportunity to present its latest developments.

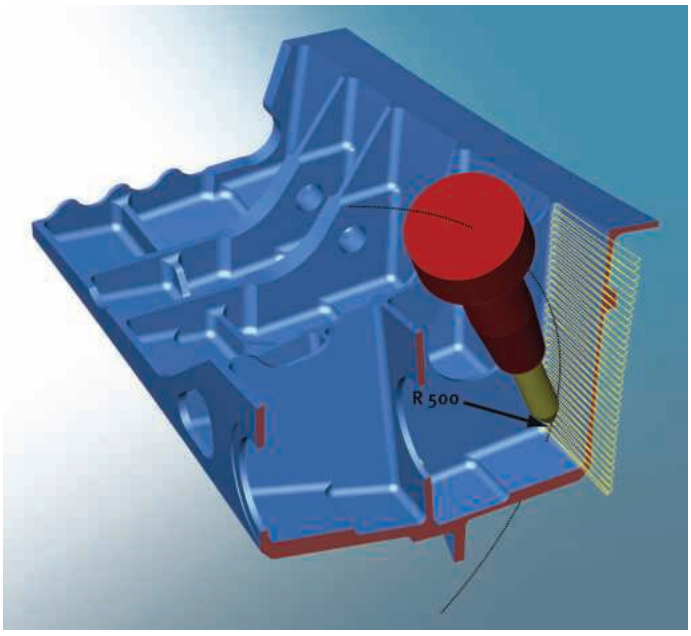
A particular highlight of the new version is the finishing strategy from the new hyperMILL® MAXX Machining performance package. 'Tangent plane machining' makes it possible to achieve machining time savings of up to 90 percent. Extended functions for 3D and 5-axis machining tasks, new cycles for mill-turning and numerous innovations in hyperCAD®-S will complete the range of functions available in the new version.

'Tangent plane machining' offers users a major boost in efficiency for finishing planes and free-form surfaces. Using conical barrel cutters allows for larger path distances for the same theoretical scallop height. The OPEN MIND machining strategy takes advantage of the extremely large radius of the barrel shape, which allows for optimal inclination to the faces. This makes it possible to achieve considerably shorter machining times and a much improved surface quality. The innovative strategy is easy to program, highly efficient and reliable, thanks to the collision check performed on the toolpaths.

Toolkit with special strategies

Version 2016.1 sees OPEN MIND showcase the modular hyperMILL MAXX Machining performance package. It offers a range of optional high-performance strategies for roughing and finishing. The package includes the HPC roughing module, currently called hyperMAXX.





Mill-turning with more performance

The mill-turning innovations and optimisation strategies will also promise better performance. The user interface is now even more transparent for making inputs easier. The new cutting edge position management feature will make it possible to better define the tool cutting edge and its position.

More CAD for CAM – hyperCAD-S

hyperCAD-S, the CAD system for CAM, is packed with many innovations and extensions in the 2016 version, including extended associativity with hyperMILL and the new surface command for support during 5-axis swarf cutting.

For more details on the latest version of hyperMILL or to book your demo at the industry's leading event, contact OPEN MIND Technologies to see how they can turbo-charge your machine tool performance and productivity.

OPEN MIND is one of the world's most sought-after developers of powerful CAM solutions for machine and controller-independent programming.

OPEN MIND designs optimised CAM solutions that include a high number of innovative features not available elsewhere to deliver significantly higher performance in both programming and machining. Strategies such as 2D, 3D as well as 5-axis milling/mill turning, and machining operations like HSC and HPC are efficiently built into the hyperMILL CAM system. hyperMILL provides the maximum possible benefits to customers thanks to its full compatibility with all current CAD solutions and extensive programming automation.

OPEN MIND Technologies
Tel: 01869 290003
Email: adrian.smith@openmind-tech.com
www.openmind-tech.com

Motorsport subcontract machining expertise

High-precision machining doesn't get much more challenging than in motorsport, where each component is critical and is the product of many man-hours of consideration and discussion, long before it reaches the shop floor. Birmingham-based specialist subcontractor, GB Precision, provides clients in this demanding sector with the combination of professional expertise with high-tech equipment to help them achieve their engineering goals.

As MD, Paul Turner, explains: "At this level, we are providing engineering consultancy services almost as much as subcontract machining skills. Because the work is entirely bespoke our clients expect us to develop new ways of tackling each unique task, even though in the end we may only be machining a very small number off each part."

To illustrate the point, he describes the company's development of a transmission component for one of the world's top tier motorsport teams. "The brief and specification posed exactly the sort of challenges that we expect for this type of work. The form was extremely complex with multiple datum levels, varying sections, up-stands, flanges and undercuts, and the piece was asymmetrical. Geometric tolerances were mostly in the range of 50 µ, with some milled tolerances at 25 µ and with positional tolerances down to 20 µ, that is, plus or minus 10 µ from true position. Furthermore the customer required that a heat treatment operation was to be carried out prior to final machining. This would ensure utmost precision for the completed component, as flexure and distortion can occur during the stress relieving process."

To resolve the machining issues and develop the final successful methodology it was necessary to go through an iterative process, machining a complete trial component to test the strategy. During this stage, GB Precision discovered that, if standard fixturing was used, a very slight but significant dimensional distortion occurred to the upstanding fins when the clamps were released. So it developed a special flat fixturing solution specifically to overcome the issue; just one example of how skill and

expertise, as much as investment in staff and equipment, is needed to successfully machine these high-value, high-precision components."

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Mazak brings multi-tasking and SMOOTH Technology to Autosport

Yamazaki Mazak will be giving debuts to its latest INTEGREX multi-tasking machine and its revolutionary SMOOTH Technology at Autosport Engineering 2016.

Mazak will be exhibiting a new INTEGREX i-200ST, which offers a higher performance and greater workpiece capacity than any other multi-tasking machine in its class. The i-200ST is equipped with 5,000 rpm main and secondary spindles and a 12,000 rpm milling spindle, making it ideal for DONE-IN-ONE machining.

The i-200ST will be equipped with Mazak's new SMOOTH Technology, specifically SmoothX control, which has been developed for 5-axis machining. SmoothX utilises a 19 inch ergonomic touchscreen and, in operation, can reduce the number of keystrokes required to enter a program by 38 percent compared to its predecessor. Cycle times are also dramatically reduced, through a combination of the latest generation high speed servo drive and motors package, which can achieve speeds of up to 540m/min, four times faster than its predecessor control.

Mazak has a long history of supporting Autosport Engineering and supplying CNC machine tools to the motorsport sector, most notably in its relationship with McLaren Honda as the Formula One team's Official Supplier of CNC machine tools. There are currently over 25 Mazak machines in operation at the McLaren Technology Centre in Surrey.

Richard Smith, managing director UK & Ireland sales division, for Mazak says: "Autosport Engineering is one of the highlights of the machining year and we are excited to be able to showcase two new technologies at the show. The INTEGREX i-200ST is an exceptional machine, perfectly suited to autosport and automotive applications, and equally adept at small batch and prototype work, or in volume production roles."

Richard Smith concludes: "The machine is equipped with SmoothX Technology, the world's fastest CNC, which promises to revolutionise programming and cycle times for machine users. We are confident that visitors to Autosport Engineering 2015 will appreciate the combination of INTEGREX multi-tasking capabilities and SMOOTH Technology during the live cutting demonstrations that will take place during the show."

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Southern Manufacturing 2016

SOUTHERN 16 Manufacturing & Electronics

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9th to 11th February 2016

The UK's LARGEST regional manufacturing technology, electronics and subcontracting exhibition takes place again at FIVE, Farnborough from 9th to 11th February 2016. Now open for three days and with its vast range of machinery and suppliers in one show, the event is a vital exhibition for subcontractors and engineers over the South.

Southern Manufacturing has grown into an excellent engineering resource for engineers across, not just the Home Counties, but the whole of the UK and increasingly continental Europe as well. Its purpose-built 18,000m² venue next to Farnborough Airport in Hampshire brings together manufacturers, tool suppliers, subcontractors and suppliers of every kind, between them covering virtually every possible engineering necessity. Thousands of engineering and electronics solutions are quite literally on your doorstep.

Southern is considered by many to be the UK's main annual opportunity to encounter such a wide range of companies in one venue.

An event this size, with over 800 exhibitors are taking part in 2016, could easily become a little overpowering. But handily the show is divided into several areas to aid orientation, with Technology Trails weaving between them to assist visitors with a specific interest in sectors such as aerospace, autosport or medical technology. Although it's possible to register on the day, pre-registered visitors have the advantage of being able to receive the detailed free show guide which is a great help in planning a visit to the show.

Admission to the event is free and FIVE Farnborough offers ample complimentary car parking and easy access by road or public transport. To register for tickets, simply visit **www.industrysouth.co.uk**

Show visitors can keep up to date with the latest event and exhibitor news by visiting the show's official blog.

Southern Manufacturing seminars announced

The free technical seminar programme at Southern Manufacturing & Electronics 2016 has been announced. Running over all three days of the show, the programme is an immensely popular feature of the UK's biggest annual manufacturing technology event.

The programmes run concurrently in two seminar rooms over the three day event, focusing on general engineering topics and electronics respectively. A total of 28 one hour sessions will address a huge variety of topics from CE Marking to the latest advances in 3D printing and additive manufacturing. Like the show itself, the free technical seminar programme will appeal to anyone involved in engineering, electronics and industry.

Highlights of the programme include the return of Stefan Knox of Bang Creations, with his hugely popular look at Good Design and How To Generate Good Ideas. Nick Statham of Fasturns UK looks at the potential cost savings of the Automation of Flexible Manufacturing. Energy is one of the biggest overheads of manufacturing. In

Measure Your Energy, Ben Murphy discusses energy saving strategies illustrated with case studies. 3D printing comes under the spotlight when Sav Jeyendran of Canon UK looks at the possibilities of this rapidly emerging technology. Robin Zhang looks at meeting the legislative requirements for exporting globally, while further advanced manufacturing techniques and materials are examined in An Introduction to 3D Print and Future Applications of Advanced Materials.

Ailsa Kaye returns with her popular look at the latest thinking in Best Practice for World Class Manufacturing. The topics of Lean and 6 Sigma are examined in sessions with Tim Scurlock and Barry Byrne. Nick Wainwright of York EMC reviews the latest EU Directives and their implications, and returns for a second session looking at how to make sure your products remain compliant. In Customer Bonding Strategies in the Supply Chain, Jonas Haterm of Mobius UK looks at the latest thinking for effective CRM for manufacturers. A second session deals with Supply Chain Analytics, Sales & Operations Planning. Eco-design and the ErP Directive are examined by Alistair McLaughlin of TUV SUD Product service, while Alastair Morris from Pryor Marking Technology, who are also exhibiting at the show, will look at Error Proofing and Traceability. Further sessions cover CE Marking, Patents & Trademarks and more.

A full list of sessions can be found at **www.industrysouth.co.uk**

Entry to the seminars is free, but pre-booking is strongly advised as popular sessions fill up quickly.

Visitors can keep up with all the news from the show by following **@Industry_co_uk on Twitter and the hashtag #southmanf**.

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T Cards online and manual display systems

A simple and effective way to provide the power of information

The successful T Cards Online system, which enables users to manage workflow in real time using the simple drag-and-drop technique and moving cards around the 'online board' to reflect current status, will be on display at Southern Manufacturing, Stand G140. Launched in 2010, T Cards Online (**www.tcardsonline.co.uk**) has become established as the market leading online workflow monitoring system and benefits hundreds of customers across the UK that appreciate the convenience and flexibility of online access to essential information.

The T Cards Online system was a logical development for T Cards Direct to apply their extensive experience gained over many years of developing and marketing their manual based T Card Board and Card system. In many other manufacturing applications, especially in providing health & safety information, the manual board system remains the best solution and these products will also be on display.

Providing information and communicating with staff and colleagues in the workplace is essential, particularly when hazards, incidents or near-misses occur, along with maintenance planning which may impact on others.

An effective, low-cost solution to 'getting the message across' is the Near Miss / Incident Reporting / Maintenance Planning System boards available from T Cards Direct.

With compliance and accountability being increasingly important in the work place, these manual board systems provide a record and history with traceability from the time the incident occurred or when maintenance is scheduled. The standard display board is available in a 3 column format with standard 50 or 30 cards deep and measures 409 mm wide and is supplied fully assembled, complete with headings and 200 Incident T Cards.

There is also the option to have the system made to a bespoke format.

The T Cards Online System along with examples of manual boards for Near Miss / Incident Reporting / Maintenance Planning / Continuous Improvement applications, will be on display at Southern Manufacturing and reflect T Cards Direct 45 years of experience in providing effective and affordable information systems.

T Cards Direct
Tel: 01732 871417
Email: philip@tcardsdirect.com
www.tcardsdirect.com

Visitors to get a grip at Southern Manufacturing

Many manufacturers have now recognised they can improve surface finishes and tool service lives by utilising the innovative TRIBOS system, and at Southern Manufacturing, the latest interfaces from SCHUNK will be on show. These deliver a higher level of standardisation for the precision tool holding systems for micro machining and 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 standardized 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 1/8 inch, while TRIBOS-RM will offer ø 3, 4,

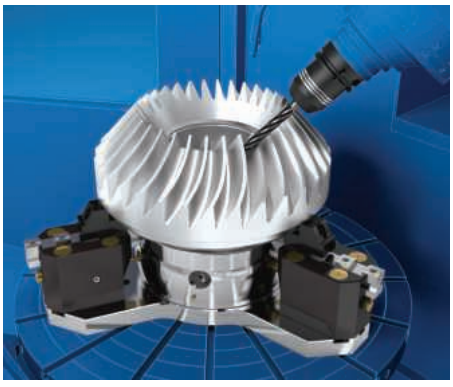
6, 8, 10, 12 mm and 1/8 inch. In addition to the HSK-A 25, -A 32, -A 40, -E 25, -E 32, -E 40 interfaces that are already available, both mounts will also be available for HSK-E 20, HSK-F 32 as well as for BT 30 and SK 30. These units from SCHUNK can now be manually actuated via the SVP Mini and SVP-RM devices.

The TENDO E Compact hydraulic expansion toolholder is capable of reducing setup times by up to 60 percent, whilst generating up to 2000 Nm of torque. It 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.

The innovative SPM Plus 138 fixture membrane is manufactured from aluminium and enables 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.

The SPM and Vero-S modules will be complemented by the SCHUNK PRONTO quick jaw change system that has a change-over time of 5 seconds per jaw. The new SCHUNK PRONTO quick jaw change system offers remarkably fast setup times for all standard lathe chucks with fine serrations of 1/16'' x 90° and 1.5 mm x 60°. The quick-change retrofit set from the competence leader for clamping technology and gripping systems consists of supporting and changing jaws. The new innovation is suitable for OD clamping of pre-machined and finished parts. Utilising a selection of interchangeable inserts, the clamping range can be extended up to 16 mm without having to reset the supporting jaw - an increase of 300 percent in comparison to conventional lathe chucks.

Ideal for single-part and small-batch production, the Kontec KSC accommodates conventional clamping, small clamping depths, moulded parts, plates or workpieces with saw cuts. The Kontec KSC has a clever, forward-looking construction that makes it possible to design high supporting jaws. In this way, all sides of the workpiece can be ideally reached without danger, even with standard tools at a clamping force that can be increased to as much as 35 kN.



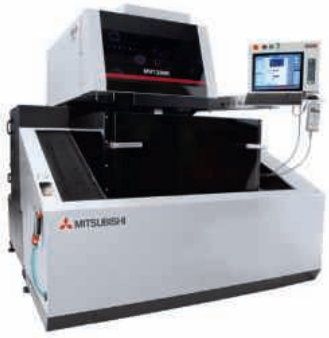
Finally, the LINOMAX special grease from SCHUNK is recommended for the lubrication of power chucks. The light-coloured adhesive grease with solid lubricants has been specially developed for sliding surfaces exposed to high pressure loads and water in the form of metal machining emulsions. It is especially resistant to washout, prevents seizure and provides anti-corrosion and excellent anti-wear protection.

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

HK Holdings has blueprint for success at Southern Manufacturing

At the Southern Manufacturing Exhibition, HK Holdings will be offering visitors the opportunity to experience the potential of Metal 3D Printing and Wire Erosion (EDM) on Stand V98. This exciting innovation will be demonstrated using the company's market leading Mitsubishi MV1200R EDM machine and 3D Systems ProX100.

HK will be introducing the ProX100 machine for the 3D printing of small metal components, appearing alongside the impressive Mitsubishi MV1200R. HK will aim to educate the industry with regards to how 3D printing technology can complement traditional machine tool technologies and manufacturing processes.



The new ProX100 from HK3D Solutions is the very latest evolution of 3D printing technology from 3D Systems. The ProX100 is a high-performance, high-quality alternative to traditional manufacturing processes. For manufacturers that are new to the 3D printing arena, the ProX100 provides a multitude of benefits such as reduced waste, reduced setup times, greater production speeds, very dense metal parts as well as the ability to produce very complex assemblies as a single component.

The flexibility of the system is extended to the range of materials that can be processed. With over 15 material options that include stainless steel, tool steel, super alloys, ceramics, non-ferrous alloys, precious metals and aluminium, the ProX100 can create a chemically pure, fully dense part.

Also appearing on the stand will be the Mitsubishi MV1200R EDM machine. This latest wire EDM innovation operates with full support of the best auto threading system on the market today.

Incorporating the latest advancements in machine construction and power supply technology, the MV1200R is revolutionising EDM machining. For example, the Mitsubishi MV1200R introduces an impressive annealing length of over 350 mm that makes this system capable of threading the maximum workpiece height and also providing a realistic opportunity for the customer to thread through the gap as well as dry (no water jet) for smaller workpieces. This is an innovative new feature for end users that may need to recover broken wire.

The MV1200R also features the M700 Series control with a particularly large 15-inch touch-screen. This Windows based control is both intuitive and user friendly and with the 15 inch screen, it improves operation for the end user.

The MV series introduces the world's first Linear Shaft Drive System XY which delivers smooth, highly controllable movements and unparalleled precision levels, supported with a 12 year positional manufactures warranty, with unbeatable speed, precision and running cost reductions.

HK Holdings Tel: 01788 577288
Email: info@hkholdings.co.uk www.hkholdings.co.uk

Nakamura raises the bar with the NTRX 300

With twin opposed spindles and an upgradeable 8,000 rpm milling head, the innovative NTRX 300 5-axis simultaneous machining centre from Nakamura-Tome is a heavy duty multi-tasking unit offering complex, high value component machining capability in a single setup.

The NTRX-300 is available from the Engineering Technology Group in Southam who are exclusive distributors for Nakamura-Tome Machine Tools in the UK and offer extensive engineering and technical support throughout the lifetime of the machine.

Despite its power and capacity, 30 kW cutting power available for shaft turning with a standard 65 mm through bore bar as standard, the NTRX-300 has a small footprint. Yet the X- and Y-axis travel on the machine ensure a machining range of 250 mm wide, further enhanced with the X-axis having a 125 mm travel below the spindle centre to extend the machining range to 250 mm square. The Y-axis slide travel of 250 ± 125 is considerably greater than many other machines in its class.

Features within the machining envelope include the B-axis with a 225 degree rotation, a maximum workpiece turning length of 1150 mm and the distance between spindle centres of 1350 mm.

Because of the 300's reduced distance from the tool tip to the B-axis centre of rotation, the B-axis resists cutting torques and retains stable machining performance. The X, Y and Z axes are all highly stable, being directly mounted to their respective ball screws to ensure backlash free, high speed and smooth movement.

The NTRX-300 features a robust 18.5 kW tool spindle offering 8,000 rpm (12,000 rpm optional). It is available with either tailstock or twin spindle configurations.

In twin spindle configuration the LH and RH spindles offer 4,500 rpm with 15 kW powerful motors and up to 30 kW cutting power can be available for turning shaft work with the synchronised spindles. High powered versions are also available for larger bar capacity versions at 22 kW.

All these features in a machine mounted on a uniquely designed bed which maximises thermal stability, creates uniform loads during slide movement and features a highly rigid spindle.

It also features a unique in-built load/unload device, a 40 tool Capto C6 ATC as standard (60, 80, 120 optional) as well as the standard bar capacity of 65 mm with upgrade options of 71 mm, 80 mm and 90 mm diameter.

The NTRX 300 5 axis simultaneous machining centre from Nakamura-Tome is a heavy duty multi-tasking unit

The X-axis on the NTRX 300 has a 125mm travel below the spindle centre to extend the machining range to 250mm square

From the operator standpoint, a feature of the NTRX-300 is the ergonomic operating position with the easy to reach spindle centre at 1100 mm above floor height and 450 mm from the door. Likewise the operating panel offers a range of vertical and lateral adjustments making it easier for the operator to work at the panel.

The NTRX-300 features a graphic user display on a colour LCD monitor interfacing with the main control based on the Fanuc 31i-B 5-axis system.

The NT Smart X Operation Software (using Windows 8.1) offers an "operation level management" function to view the operator clearance level "productivity monitor" function that also shows the status, productivity graph and capacity utilisation of the machine with a loading monitor function advising detailed load information.

The NT Smart X screen also enables an operator to view the NC programme while watching the 3D interface check and to view CNC coordinates while watching the machining area through a video camera. Voice guidance and production management are also included.

The Engineering Technology Group brings a new kind of thinking to the high-technology machine tool market.

By providing in-depth support and applying insight, experience and expertise, the company aims to help you get the maximum benefit from advanced manufacturing technologies.

Engineering Technology Group
Tel: 01926 818416
Email:djames@engtechgroup.com
www.engtechgroup.com

Steam Traction World - The model business

Steam Traction World manufactures a range of fully machined, large-scale engine models in kit form, ready for their customers to do the final assembly, paint and add their own personal touches to 'make it their own'. The Daventry based company's goal is to provide a product that would otherwise take years to produce from scratch. In other words they are selling time. Time that will enable their customers to have fun with their engines, rather than spending thousands of hours in the workshop with the possibility that they may never see a completed project.

All Steam Traction World parts supplied are machined and ready for assembly after final deburring, sanding and paint. Most models may be purchased over a fixed period of time with kits arriving at regular intervals to enable the customers to build as they buy. For example, the most popular selling model is a 4" scale traction engine (4" scale means 4 inches on the model will equal 1 foot in the real world, so is 1:3) 24 monthly payment sees a supply of parts delivered in a progressive build sequence.

Steam Traction World kits are designed to be assembled with limited access to engineering facilities and machine tools. The parts are easily bolted together with no riveting necessary. Boilers are supplied fully constructed, either silver brazed throughout if made of copper, or welded if made of steel. Both types are hydraulically tested to twice working pressure.

The company was founded in 2008 by Dean Rogers and Steve Baldock. It has undergone rapid expansion, currently employing 12 staff with a yearly turnover in excess of £1 million.

Today, the company runs 9 CNC machines including their most recent investment a Haas ST-10 Y-Axis lathe with bar feeder.

Dean Rogers explains the decision to buy Haas: "We bought the Haas with a particular part in mind, a brass star that goes on the showman's engine. We'd previously been producing the eight fingers needed for each star on a mill, but I worked out that this could be done far more efficiently and quickly on a lathe with live-tooling. From everything I'd heard about the Haas lathe, I knew it was the right machine for us. Word of mouth is a very powerful thing.

Haas Automation Ltd
Tel: 01603 760539
Email: cnc@haas.co.uk
www.haas.co.uk

All's Wele with 5-sided machining capability

By investing in a Wele bridge-type vertical machining centre, Glassworks Hounsell (GWH) plans to expand its in-house product machining capability, create more jobs and move its subcontract production services into new sectors with the advantage of five-face processing.

Sourced through 2D CNC of Hinckley, the Wele SB316M bridge-type machining centre has a table size of 3,000 mm by 1,500 mm with X, Y and Z travels of 3,060 mm by 1,600 mm by 800 mm. It has a BT50 gear-driven spindle of 26 kW giving 6,000 revs/min supported by a 32 position tool magazine.

The company was originally founded in 1877 and currently employs 26 people with 11 on the shopfloor of the 25,000 ft^2 facility in Halesowen and, as part of its expansion plans, further recruitment is now underway. The company turnover is largely driven from its in-house design, production and subcontract services that involve fabrication, machining and assembly.

Half of sales are generated from production of its core competence industrial feeders supplied to the glass industry while a diverse range of precision engineered products are also supplied to sectors that range from packaging and labelling to confectionary and the automotive industry. Most recently GWH has become a lead supplier to a Flexographic printing press manufacturer that recently shipped an 11 m long print press with run speeds of 150 m/min into mainland Europe.

Jeff Blackborow operations manager says: "We machine a multitude of large and prototype components while providing a valuable and diverse subcontract machining service." He explains how a horizontal boring machine needed to be replaced which is very skill dependent and was becoming uneconomic on very small and often complex batches of work.

Jeff Blackborow concludes: "We also have future business opportunities to expand our subcontract operations into offshore, power generation as well as defence, nuclear and aerospace industries.

"We compared similar machines focusing on build quality linked to value-for-money and here the Wele was hard to beat with its specification and five-sided capability to meet our prime requisite of flexibility."

2D CNC Machinery Ltd
Tel: 0844 871 8584
Email: d.holden@2dcnc.co.uk
www.2DCNC.co.uk

First 30-taper machining centres with one metre X-axis installed in the UK

Diecaster is pleased that specifying a big working envelope no longer means settling for a slow machining centre.

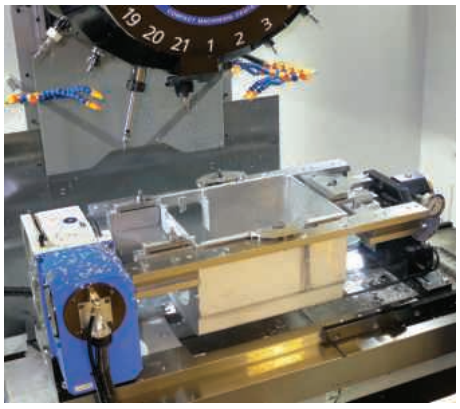
Largely as a result of receiving new medical and aerospace contracts, turnover has increased by 70 percent in the last 12 months at MRT Castings, an aluminium diecasting company in Andover. Noteworthy is that the tonnage has scarcely changed. The increase in business is nearly all derived from machining the castings, which are becoming ever more complex, and from producing sub-assemblies.

A user of Brother machining centres since the early 1990s, MRT has invested in six further machines in the last year and a half from UK agent, Whitehouse Machine Tools to cope with extra demand, bringing the total number of these Japanese-built, 30-taper machines on site to 18.

The latest two S1000X1 machines, are the first new models in the UK with a 1,000 mm X-axis. It is around one-third longer than that of the largest machine available from other 30-taper machining centre manufacturers, including Brother until now. Despite the 1,100 x 500 mm table, the machine's footprint is compact at a nominal 2.4 metres square.

Phil Rawnson, managing director of MRT comments: "Designers from Brother visited us in mid-2013 to ask what type of machine we would like them to develop next. Consulting with its customers is a good sign, as it means that the machine builder is listening to what the market wants.

"As we are milling, drilling and tapping near-net-shape aluminium castings in low to medium volumes and removing typically only a couple of millimetres of material, a 30-taper spindle is suitable for our needs. We told Brother that we wanted a larger



machining envelope to give us more flexibility in the way that we fixture parts. Two years later, in June this year, the two S1000X1s were on our shop floor."

As a 30-taper machining centre with a one-metre X-axis stroke did not previously exist, Phil Rawnson bought 40-taper machining centres to process MRT's larger castings. There were disadvantages, however. 40-taper machines are of unnecessarily high power for skimming off 2 mm of aluminium and are consequently overly power-hungry. They also tend to be more expensive to buy and the rapid traverses and spindle acc/dec are slower, so cycle times are longer and productivity is lower.

The S1000X1 design avoids these negatives by providing a highly productive machine with 50 m/min linear rapids (slightly higher in the 300 mm Z-axis). Tool change executed by the 21-station turret takes under one second, giving a chip-to-chip time of 1.4 seconds, and is performed at the same time as X and Y axis movements and rotary table indexing to reduce idle time further. Rapid cutter exchange is an important aspect, as a large mix of tooling is needed to machine MRT's castings.

A new ISO control, CNC C00, provides faster processing, more functions and higher accuracy machining, especially in 3D. MRT's existing programs for its 16,000 rpm Brother machines run 10 percent faster on the S1000X1s without any modification, sometimes even faster depending on the type of cycle and the number of tool changes. If a program is transferred from an earlier 10,000 rpm spindle Brother machine fitted with the previous control to a 16,000 rpm S1000X1 with the CNC C00, average cycle time savings are even higher at around 30 percent.

When asked how he harnesses the extra working volume of the Brother S1000X1s, Phil Rawnson replied: "There are four ways we use the capacity.

"First, we had a 150 mm column riser fitted to both machines so that we can swing a 550 mm part on a trunnion arrangement comprising a rotary table and tailstock. By using a bridge style fixture with pockets in the fixture plate, the fourth CNC axis allows machining to be completed on four faces of a casting in a single operation.

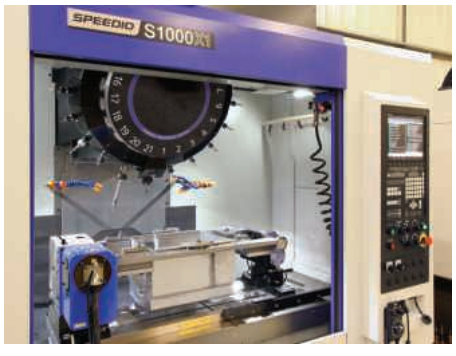
"Secondly, if we need to hit the remaining faces of a component, we can carry out the secondary machining operation sequentially by fixturing parts side by side on a single fixture.

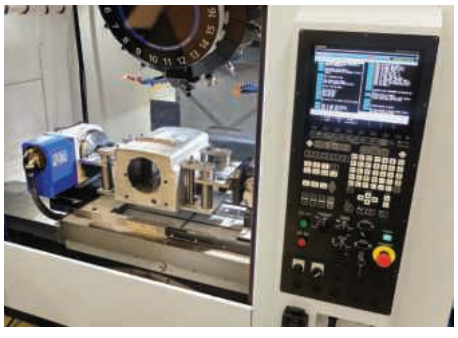
"Thirdly, we are able to fixture a larger number of smaller parts to fill the table. By putting more castings under the spindle at the same time, fewer tool changes are needed per component and productivity is increased.

"Lastly, of course, we can machine castings up to one metre long in three or four axes and at the highly productive rates possible using a 30-taper machine. Shoehorning larger parts onto our smaller machines is a thing of the past and it saves a lot of time."

Irrespective of how the machine is employed, speed is of the essence at the two machine shops on the Andover site. MRT uses four pressure diecasting cells, the fastest of which are capable of producing a casting every 40 seconds, and nearly all of them need to be machined in cycle times ranging from two to 20 minutes.

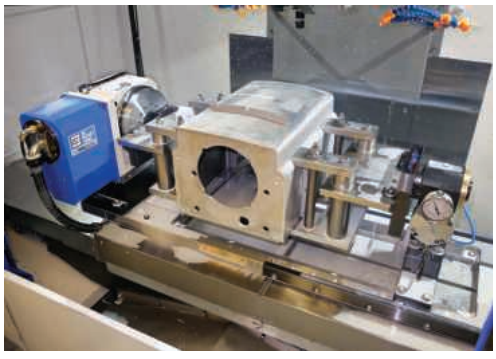
To keep up with the metalcutting requirement over an extended day shift, the





18 Brother machines are of two configurations. Eleven have fixed tables, while the others are equipped with automatic twin-pallet changers utilising a total of 25 pallets setup with rotary trunnions and dedicated fixtures to speed changeover to the next batch. This occurs typically every one to two days per machine.

The twin-pallet Brothers are generally used if cycles are short, say less than five minutes, to minimise spindle idle time during sequential op 1 and op 2 machining on six sides of a casting. Fixed table machines are more economical if cycles are longer, as one operator is able to load and unload a pair of machines to complete the two operations in tandem.



To keep pace with production, trouble-free operation is as important as speed. Phil Rawnson affirms that there has been little downtime on the Brother machines over the years and their inherent reliability is reinforced by maintenance contracts and prompt service back-up from Whitehouse Machine Tools.

Accuracies achieved are impressive, sometimes down to a couple of microns for bearing bores. Some electrical assemblies, for example, comprise up to 20 individual castings and tolerance build-up can become a problem if such tight limits are not held. Other work for the electronics, defence and top-end lighting sectors also stipulate tolerances that are sometimes very tight. Parts coming off the Brothers are not only dimensionally accurate but also highly repeatable, according to Phil Rawnson.

He concludes, "Whitehouse Machine Tools supplies every new machine as a turnkey cell complete with tooling, through-spindle coolant, a fourth axis, mist extraction and tool and part probing. Programs, fixtures and tools are freely interchangeable between the machines, which gives us a lot of production flexibility.

"MRT Castings has been a family run business since its formation in 1947 and has always worked in partnership with its customers, constantly evolving to meet their demands. Brother has adopted a similar partnership approach by listening to what we and other subcontractors want and developing new machines to fit our changing requirements."

Whitehouse Machine Tools Ltd
Tel: 01926 852725
Email: timw@wmtcnc.com
www.wmtcnc.com

No crash, no bang, no wallop!

GF Machining Solutions' collision protection system on its machining centres keeps spindles in tip-top condition.

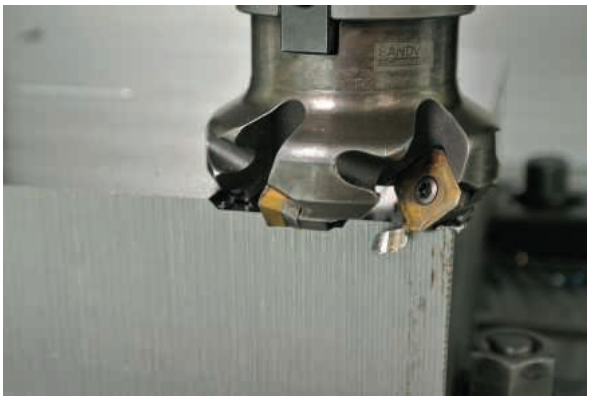
Collisions on machining centres can cause costly damage to the spindle as well as other machine parts and potentially the workpiece too. To avoid these issues GF Machining Solutions has developed its Machine and Spindle Protection (MSP) feature.

Collisions that can damage a machine tool's spindle are most likely to occur when a new job is being setup or first attempted.

The total cost for spindle repair/ replacement can often exceed the price of the unit itself when one takes into account that other machine components might also be damaged by the collision, as well as lost production time while the machine is down for repair.

As a result, GF Machining Solutions developed the Machine and Spindle Protection (MSP) feature for its Mikron machining centres.

The MSP feature is comparable to the Integrated Collision Protection (ICP) capability that has been available on AgieCharmilles wire EDM machines for some time. The system for the wire machines has energy-absorbing, spring-loaded ball-screws on the linear axes and two types of positioning sensors for each axis, a rotary encoder and a glass scale. If the location detected by the rotary encoder and glass scale for a given axis differ by a predetermined amount (meaning a collision is occurring), the system stops machine motion within microseconds before damage occurs.



Similarly, the MSP feature for milling machines uses a mechanical system that enables the spindle to deflect slightly in X, Y and Z axes during a collision. A sensor system detects this deflection and stops machine motion before the spindle/spindle bearings are damaged.

GF Machining Solutions guarantees that the MSP feature will prevent spindle damage at travel speeds of 12 m/min. or less. In fact, an M304 code was developed to cap the rapid feed of the linear axes at that rate. Once a new part program is proven out and it is determined that there will be no collisions during the operation, a subsequent M305 code disables the MSP feature and enables the machine to run at normal production speeds.

GF Machining Solutions Ltd
Tel: 02476 538666
Email: info.gfms.uk@georgfischer.com
www.gfms.com/uk

It's all part of the service

Founding a business relationship based on exceptional service levels has paid dividends for CNC International with the recent supply of its fifth new machine tool to wire and die sink EDM subcontractors Multispark. The delivery of two new Accutex AL600 wire EDM machines in December 2014 is just the latest chapter in this longstanding relationship.

Poole based Multispark is one of the UK's foremost technology leaders in the EDM field with a rich history in the niche sector that dates back to the 1960's. With decades of expertise that is put to task on some of the most technologically advanced wire and die sink EDM machines, Multispark is a market leading subcontractor to the oil & gas, motorsport, satellite and aviation industries. To retain its benchmark position in the EDM sector, Multispark has acquired machines from a broad range of manufacturers down the years. The common thread among these machines is they are all serviced by Ross-On-Wye based CNC International.

Back in 2000, the ISO: 9001 registered subcontractor had a machine shop full to the brim with Swiss wire and spark erosion machine tools. However, despite the multitude of new machine acquisitions from the vendor, the service proved woefully poor. Something that enabled CNC International to get its foot through Multispark's door. For over 25 years, CNC International has specialised in the servicing, retrofitting, rebuilding and sales of used EDM machines. It was this reputation and expertise that formed the basis of a long-lasting relationship.

Commenting on the situation over the last 15 years, Multispark's director, Mr Dave Sheldon says: "In the late 90's we were receiving poor machine tool service and this meant that machines would be down for long periods of time. With such an unacceptable situation, we found CNC International and they have been servicing our machines ever since."

This partnership has blossomed ever since, with initial machine servicing evolving into the acquisition of numerous refurbished 2nd hand machines. As Dave Sheldon continues: "We were initially using CNC International to service machines at our Luton facility and the service was so good that we started to buy refurbished machines. When we opened our Poole facility we purchased a used Agie 100D and an Agie Mondo from CNC International. They understood that machine uptime was a critical factor for us and they have done their utmost to maximise this down the years. After the initial acquisitions, we were buying 2-3 Agie machines each year from CNC International. However, a couple of years ago this started to change with CNC supplying new machines as well as used."

A change of direction

In 2010, CNC International ventured into new machine tool sales by taking on a number of agencies to support its service, support and refurbished machine tool sales. The level of service that Multispark had historically received enticed the Dorset company to purchase a Neu-ar CNC-A50 spark erosion machine with an automatic tool change facility. Purchased to support the company's increasing capacity needs, the Neu-ar was the ideal addition to the plant list. Dave Sheldon continues: "The Neu-ar CNC-A50 was the perfect machine for our small components. It has a small tank that is filled rapidly, its cycle times are extremely fast and compared to our old machines, the uptime has significantly improved."

Whilst the CNC-A50 met the demand for small components at Multispark, the company was turning particularly large jobs away as it didn't have a machine large enough to fulfil many orders. Multispark reviewed the market and the inflated prices of large machines from some vendors made CNC International's large bed Neu-ar C-1000 die-sink, the obvious choice. As Dave Sheldon says: "We were either turning large work away or altering our existing machines to fit jobs, which was time consuming and potentially compromising precision. The 2011 arrival of the Neu-ar C-1000 is the UK's largest Neu-ar installation to date with its tank dimensions of 1.8 m by 1.1 m by 615 mm high. We can load parts close to 2 m on the machine and the processing time is 30 percent faster than our other machines. This is credit to its large generator that reduces cutting times. A recent example of the cycle time saving was noted on a repeat oil & gas industry job that used to take 20 hours to process. On the C-1000 we did it in 12 hours."

"This machine also improved our precision and setup times. Our other machines could only orbit the tool in the Z-axis whereas the C-1000 can orbit in all axes, which has drastically cut setup times and eliminated the constant re-setting of workpieces. Additionally, the C-1000 has a very powerful pump for filling and flushing

the tank and this has also reduced non-cutting times."

Using the Neu-ar machines frequently, Multispark's works manager, Chris Bailey comments: "The Neu-ar machines are very easy-to-use and intuitive. The in-built software has a simple layout that makes the learning curve very short and with icons on the control screen, the machine leads the operator through the process. Furthermore, we can spark at angles on the Neu-ar and this reduces our setup times considerably."

Another hole new solution

With two very different machines already installed for small fast turnaround parts and large oil & gas components, the next step for Multispark was to invest in a hole-burning machine. Purchased for the removal of broken drills and taps from customers components, Multispark already had the in-house capability but the arrival of a Shiang-Yang SY-2535 hole burner increased the speed and more importantly the capacity. Emphasising the importance of the 2014 acquisition, Dave Sheldon says: "Previously, we could only burn holes up to 300 mm deep. The Yang machine gives us 600 mm in the Z-axis, so we can process deeper holes up to 6 mm diameter. We found this machine capacity beyond the realms of anything else available."

As well as the die sinking and hole burning machines, Multispark's most recent purchases were two Accutex AL600 wire erosion machines to replace two ageing and unreliable machines. The Accutex additions in December 2014 have improved the company's ability to perform lights-out machining whilst reducing down-time and maintenance requirements and running costs.

Dave Sheldon concludes: "CNC International started by delivering outstanding service. This was followed by an ability to supply high quality new machine tools that support the ever changing needs of our business. We are following a rapid growth strategy that will soon see us double our 5000 sq/ft floor area. With an empty facility waiting for new machines, we can guarantee that CNC International will play a significant role in our future with its supply of innovative and highly productive machines and also the service and support to ensure these machines achieve maximum utilisation rates."

CNC International
Tel: 01989 562408
Email: sales@cncinternational.co.uk
www.cncinternational.co.uk

HMC launch shows that Hartford doesn't rest on its laurels

Hartford has expanded its range of Laurel horizontal machining centres with the addition of the HMC-8, a 1,000 mm by 850 mm by 950 mm (X, Y, Z axes) capacity machine available from T W Ward CNC Machinery (Ward CNC), the exclusive distributor in the UK and Ireland for the Taiwanese builder.

The rigid machine has been specifically designed for accurate heavy-duty cutting, a trait underpinned by Hartford's renowned construction principles that include the use of heavily-ribbed Meehanite cast iron for all major components and a one-piece T-shaped bed (for the X and Z axes) plus the use of linear guideways.

With an 800 mm by 800 mm pallet accommodating loads of 1,500 kgs, pallet indexing in 90 degrees is just 2.2 secs, pallet location accuracy is guaranteed via positioning onto four cones via air blast and hydraulic drawbar, the machine also features an ISO 50 18.5/25 kW 6,000 revs/min geared spindle.

Machining capacity is maximised, workpieces of 900 mm high can be accommodated, by a two-step X axis configuration complemented by an extra-wide 893 mm span.

The new machine has standard rapid traverse rates of 30 m/min (60 m/min is optional), a cutting feed rate of up to 8,000 mm/min and a standard 40-tool automatic toolchanger that can optionally be 60 or 90 tools. Through-spindle coolant at up to 300 psi is another option.

The Hartford Laurel HMC-8 features the Hartrol Intelligent NC conversational control software, which includes 2.5-D CAM as well as new functionality for utilisation management (daily machining time recordings) and for Renishaw's automatic measuring, tool management and workpiece calibration routines.

This new machine is the latest addition to the Laurel series that now embraces eight models ranging in X, Y and Z axis capacities from 720 mm by 700 mm 650 mm up to 1,300 mm by 1,000 mm by 1,150 mm. All are available from Ward CNC.

T W Ward CNC Machinery Ltd
Tel: 0114 276 5411
Email: lwilson@wardcnc.com
www.wardcnc.com

Hard turning success in precision and productivity

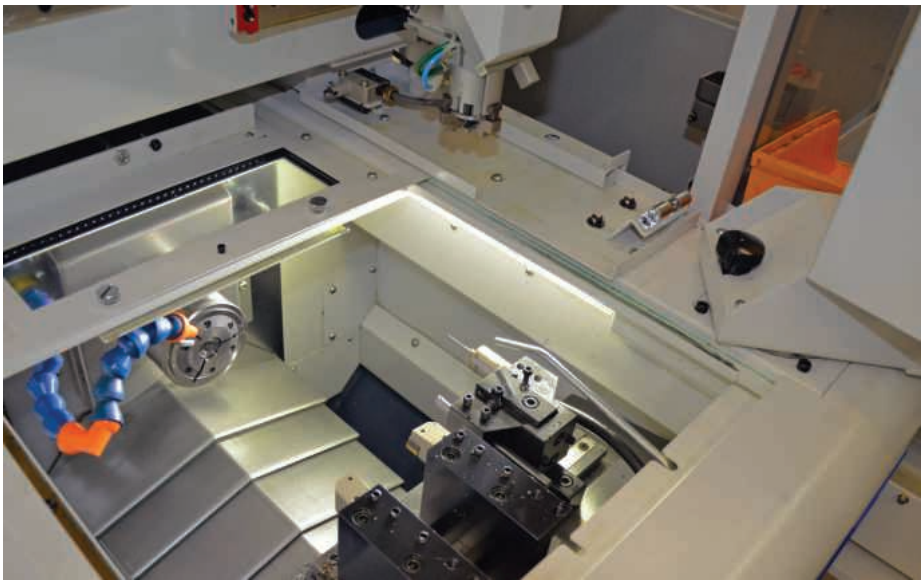
The concept behind the compact machine configuration of the Miyano GN-3200, with its integrated automatic work handling, has been adopted by Braintree Precision Components (BPC) as part of its process improvement strategy in the use of hard turning to replace finish bore and angled face grinding of strategic high precision bearing components.

Indeed, with process proven and overall savings amounting up to 50 percent on the first machine, a second has now been installed for angled face turning and trials are underway to widen the use of hard turning involving a third machine for future installation at the Braintree facility in Essex.

BPC is a division of linear motion system specialist Hepco Slide Systems based in Devon that produces over 300,000 inner guide component products and bearing systems a year which are sold in over 63 countries.

The company is no stranger to hard turning on its larger bearing types where fixed-head machines are used. However, based on this proven production method, it was keen to transfer the advantageous technology to its finishing operations on its smaller inner ring components having bores of between 6 mm and 20 mm diameter and a critical 35 degree angular face on a range of outer races. As part of the purchase justification, the first turning installation has replaced three grinding machines. Also, BPC is no stranger to Citizen Machinery UK as since 1990, nine Citizen CNC sliding head turn-mill centres have been installed for other components.

With in-depth hard turning trials carried out late in 2013 on the first stage of process improvement based on eliminating grinding from the bore of the inner ring components, at Citizen Machinery UK's headquarters in Bushey, Watford, the Miyano GN-3200 contributed significantly to create overall savings of up to 50 percent. General



Fully integrated loading and unloading, Renishaw probing and hard turning on Miyano GN-3200 at Braintree Precision Components

manager David Ford says: "These were achieved not only from faster cycle times over grinding, but also, improved and more consistent surface finish, an improvement in bore geometry and especially the elimination of taper due to grinding wheel breakdown. In addition, overall size control was more effective than could be achieved through grinding due to the different influences and variables associated with the process."

The Miyano GN-3200 is compact and thermally stable due to the symmetrical design of its frame and bed. As a result, the high orders of rigidity enables vibration damping to be maximised enabling the advantages of hard turning cycles to be fully exploited. Also, the size of the machine which requires just over 1 m^2 of floor area and is just 700 mm in width was important to BPC due to the company's demands on floor space.

The machine has an integrated high speed gantry loading system working from a pallet which can hold up to 35 bearing rings. With this loader able to overlap the majority of its programmed tasks within the overall cutting cycle, the 3.5 secs taken over its routine is absorbed.

With a single collet chuck capacity of 40 mm, spindle power is rated at 1.5 kW delivering up to 8,000 revs/min. It has a linear platen to carry the tooling where BPC have toolholders for roughing and finishing, plus a Renishaw probe on the second, recently installed angle turning machine. Travel in X is 180 mm and 200 mm in Z and rapid traverse rates are 16 m/min.

The double gripper will take pre- and post-processed parts up to 40 mm diameter by 40 mm long weighing up to 250 gms via rack and pinion drives at 130 m/min left and right and 154 m/min in the vertical axis.

The first machine installation for finish boring the bearing rings originally had to cover four basic sizes of component, however, this has now been extended in-house to 18 in order to cover special product applications in both stainless and non-stainless materials. Batch sizes can

range between 100 and 500 with cycle times enabling up to 1,200 parts to be processed a day.

Changeovers take just over the hour using standardised tool kits according to component size involving grippers, collets, cutting tools and a verification first-off check. Re-setting is often carried out up to five times during the extended day and night shifts of 18 hours. David Ford explains: "Tooling development was an important issue. When we started, inserts lasted for around 40 components which has now risen to 1,000 per insert edge. We rough and finish bore and to boost the economics of the process further, we down grade the used finishing insert into the roughing position which helps minimise the insert usage.

Braintree Precision Components is using Miyano GN-3200 to replace grinding processes with hard turning

The second auto-loaded GN-3200 was installed in June for rough and finish hard turning the critical 'self-cleaning' 35 degree taper that is the interface between the track roller and the linear guide track. The component is located by the travelling loading arm to hold the part short in a collet on the outside diameter. David Ford says: "The immediate benefit is the same as the bore machine on surface finish and we have to maintain a concentricity within two micron."

Pallet loading of inner ring bearing components as part of integrated loading and machining sequences at Braintree Precision Components

"With the machine recently installed and the critical nature of the angle, we have added a Renishaw probe to the tool platen in order to check the component prior to turning. Even with the additional probing cycle, we are still achieving the same time as grinding and we will now set about further enhancing the operation."

The Braintree facility, opened in 1989, employs 70 people on the 3,300 m^2 site containing three units, two for production and the third for assembly and stores. Investment is planned to further improve productivity to double Hepco's turnover and profitability over the next decade.

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

Additional workstation can double small parts output

Starrag Group company Bumotec has announced the s181 nine-axis turn-mill centre as a compact and cost-effective multi-function machine targeted at industry sectors such as medical and surgical instruments, horological and micro-mechanics.

Importantly, the machine features a second, live tool workstation enabling up to 40,000 revs/min milling to complement the 90-position automatic tool-changer that serves the 11 kW, 6,000 revs/min main HSK-40 spindle. This additional station effectively doubles productivity by enabling up to five driven tools to work on the rear side of one part while the main tool spindle works on another component.

In one instance, the production of a stainless steel workpiece from 14 mm bar, the cycle time on a modern machining centre was 389 seconds. On the Bumotec s181, it took just 254 seconds to complete the part, a 38 percent productivity increase.

Derived from the Bumotec s191 linear CNC turn-mill centre, a proven solution that utilises linear drives and boasts high-level thermal stabilisation to achieve 2.5 microns machining accuracies in the six-sided, complete machining of workpieces, the s181 is multi-functional turn-mill designed for the single setup, complete machining of complex and high-precision workpieces.

With a footprint of just 3.5 m^2, the machine can handle bar of 32 mm diameter and, being of modular design, can be equipped with a range of productivity-gaining options.

The s181's development was focused on the efficient production of medical, orthopaedic and dental components, as well as surgical instruments, but the new machine will be equally at home in all micro-mechanic industry sectors including watchmaking and jewellery.

Starrag Group is a global technology leader in manufacturing high-precision machine tools for milling, turning, boring and grinding workpieces of metallic, composite and ceramic materials. Principle customers are internationally active companies in the aerospace, energy, transportation, industrial components and precision engineering sectors. In addition to its portfolio of machine tools.

Starrag UK Ltd
Tel: 0121 359 3637
Email: paul.zajac@starrag.com
www.starrag.com

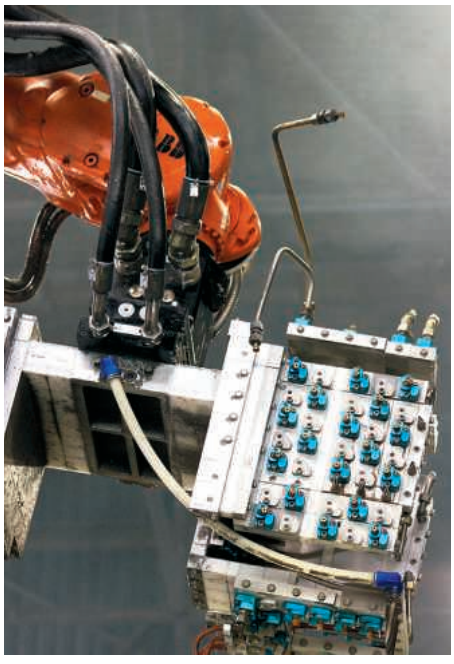
Automation – building the case for investment

There are few who would argue that the UK needs to significantly increase manufacturing output if we are to re-balance the economy and reduce the country's dependence on the service sector. Whilst the UK's automotive manufacturing plants are some of the world's most highly automated, efficient and productive, other manufacturing sectors, indeed the UK as a whole, has a poor track record of embracing automation and robotics when compared to our European cousins and Asian competitors.

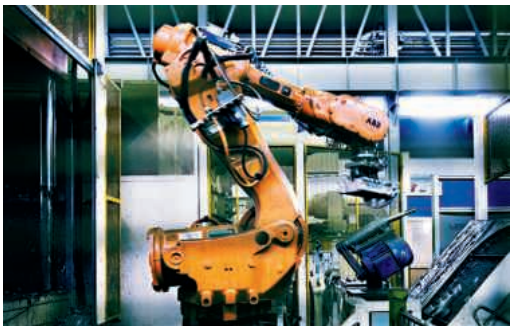
The uptake of automation and robotics here in the UK has "stalled" for a variety of reasons and in this article automation consultant Mark Le Sueur discusses some of the perceived barriers to automation and highlights how, with a more pragmatic approach, UK manufacturers can realise the benefits of automating their production processes.

For any manufacturing company, large or small, to purchase new plant and equipment a compelling business case needs to be made to justify the investment. A straight-forward and well understood process one might think, and this would certainly be true in many cases when considering the purchase of standard off-the-shelf equipment.

But when it comes to bespoke automation and robotics (systems designed and configured for specific products or processes), many UK companies struggle with the concept of introducing



technologies such as this and identifying the criteria necessary to build a solid business case. This scenario was demonstrated in 2013-2014 by the popularity of the government funded "Automation Manufacturing Programme" which offered companies the opportunity to have a manufacturing review by an independent consultant, helping them identify opportunities for automation within their business, evaluating the likely implementation costs and the potential return on investment. Some 380 plus companies from all sectors undertook manufacturing reviews, with many benefiting from the advice and guidance provided and a number going on to implement successful automation projects.



With a more pragmatic approach, UK manufacturers can realise the benefits of automation

For many companies the initial barrier to automation is the perception that the technology is so expensive that it would be out of their reach. In addition, many companies lack the in-house expertise necessary to commission new projects with confidence, worried that making significant changes and automating current processes and methods will just be too risky. For others there is a distinct lack of appreciation of the benefits which automation can bring. Taking an holistic view of the overall manufacturing process can however identify both opportunities and the criteria which will build the justification.

Automation Makes Test Processes Flow Smoothly

Even for manufacturers with an automation heritage, there can still be instances where a company's own engineers find it difficult to identify the most appropriate opportunities for additional automation systems. In cases such as this, the ability of an independent automation consultant to take an impartial view and challenge traditional procedures or process to stimulate new ideas can prove to be highly beneficial.

For example, a UK manufacturer of electromagnetic flow meters and analytical instrumentation, continuing to seek opportunities for operational excellence, employed the services of an independent consultant to help identify areas where automation could further improve productivity and efficiencies. The process started by reviewing different product lines, to select which would be most likely to deliver the greatest gains. Once identified, a more detailed evaluation of the different process steps was undertaken to allow concept solutions to be produced. This was followed by the development of a detailed User Requirements Specification (URS) covering not only the system hardware, but also essential criteria such as: performance expectations, efficiency levels, user interface, data acquisition etc. to allow suitable vendors to tender for the project.

Based upon this comprehensive URS and detailed proposals from suppliers, the company had the confidence to invest £120,000 to automate two process critical test areas in the manufacture of its range of pH electrodes. Upon installation, the automation immediately improved efficiencies and also increased available capacity through a significant reduction in cycle time. This allowed the manufacturer to plan the introduction of a new range of products that will be processed through the same system. The overall performance of this system resulted in a shorter than anticipated payback period, reinforcing the view that automation does pay if the project is approached in the right manner.

The success of this venture was such that the company embarked on a second project, this time on their electromagnetic flow meter range and in particular the larger sized meters, which posed several challenges in the handling of the products.

Invest for the future – not just today

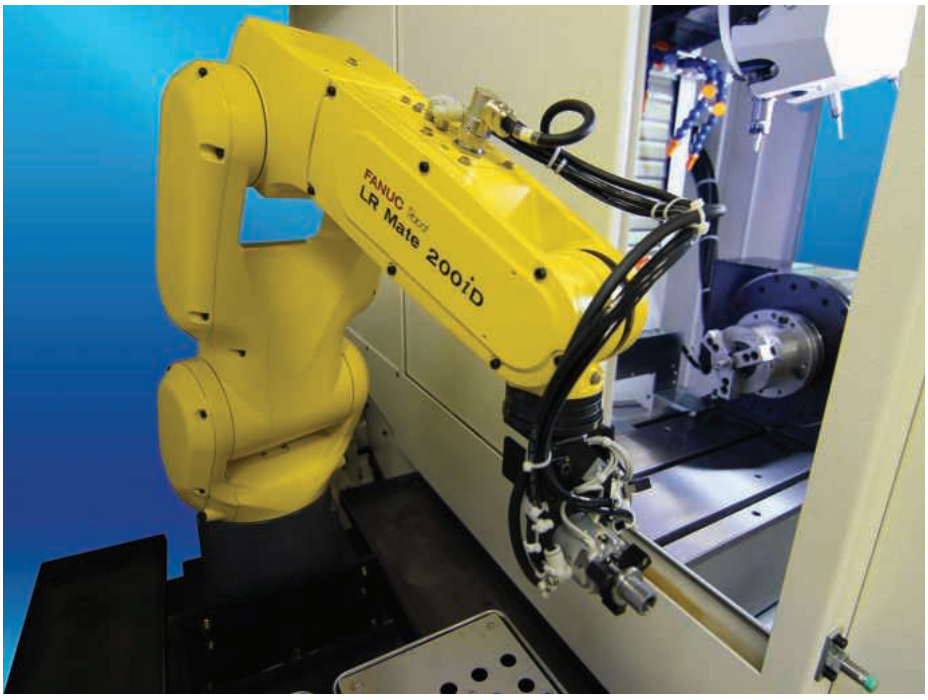
From a financial perspective, the UK still suffers from a short-term approach to investment in automation. Unrealistic payback periods are imposed by financial directors taking a 'risk-adverse' approach. However, in the longer term existing

equipment and systems become unreliable and inefficient, further widening the gap between 'now' and the 'automated future'.

Companies need to understand that robotics and automation are no longer "cutting edge" technologies

This is exacerbated by restrictive lending policies of the banks, releasing funds only where risk is minimal. All too often, companies believe projects are unjustifiable if they don't have an 18–24 month payback. This approach will never allow the significant investments needed to make step changes in business. In contrast, Germany and its approach to investment, encourages planning by family-owned businesses looking to the long term. This justifies investment (albeit carefully planned and orchestrated) and improves competitiveness, precision and quality. Capital equipment requires capital investment spread over longer periods of time, in the past periods of 5, 7 or 10 years were considered normal, promoting great, long-term infrastructure of businesses.

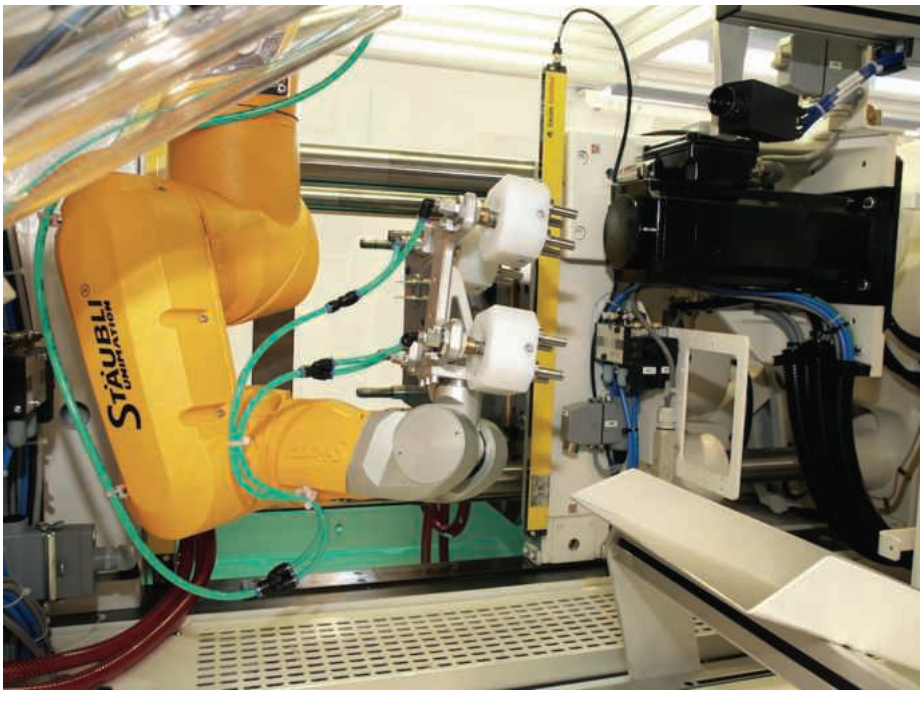
Companies also need to understand that robotics and automation are no longer 'cutting edge technologies'; they are highly developed systems capable of multi-million precision cycles with ever improving user-interfaces making their control, operation and integration ever easier. The risk is not in the hardware, it's in the specification of what is required for automation. Clear-thinking, honest justification and an understanding of the implications and costs of decisions are the key elements of a successful system.



Manufacturers need to invest not only in the robots and automation that will improve their manufacturing processes but also in the personnel and training required for a more automated environment. The UK's lack of investment in training and apprenticeships in recent years has generated a skills gap within a number of manufacturing sectors. Although many companies now have a pro-active approach to recruitment of new apprentices and engineers, it will take time for these individuals to build up the application knowledge and experience necessary to identify potential opportunities for automation and also support automated production systems. To fast-track this process, some manufacturers are turning to independent automation experts to supplement and support the formal education and training programmes for their apprentices and engineers.

These additional "automation based" training programmes provide guidance on how to seek out and evaluate potential opportunities for automation, identify what does and doesn't work, segregate the " nice to haves' " from the " must haves' " in specifications and generally provide a greater appreciation of the different automation concepts and solutions which are available to manufacturers.

So whilst as a nation we are still playing catch-up with other more automated manufacturing economies, we still have the opportunity to maximise the opportunities that are available. To do this, we should be prepared to consider taking a more long term approach to investment and draw upon the knowledge and expertise of our automation experts to initially identify, specify and subsequently build the case for the automated production systems which will propel UK manufacturing into the future.



Automa8 Ltd
Tel: 01225 309 192
Email: enquiries@automa8.co.uk
www.automa8.co.uk

Automation made easy

KUKA robots are perfectly adapted to the requirements of the machine tool industry and easy to integrate into tool industry machine environment, from loading and unloading to machining of workpieces. At the recent EMO exhibition in Milan, KUKA demonstrated how the use of highly-flexible robotic automation solutions can boost productivity.

Highly productive loading and unloading

When it comes to the loading and unloading of components in machine tools, KUKA robots stand out due to their high velocities combined with maximum flexibility and precision. At EMO, the Augsburg-based manufacturer of robots and systems demonstrated this with a KUKA small robot from the KR AGILUS series, mounted on a 4.5 m linear axis and used for the tending of two machining centres. The machine tools are used for machining the housings of cell phones.

With its payload capacity of 10 kg and reach of 1100 mm, the KR 10 R1100 impresses by performing precise and reliable machine tending with short cycle times. In order to minimise part changing times, the robot is equipped with a double gripper. The application additionally has an integrated camera system for quality control. The system can optionally be expanded to eight machine tools, which can be positioned on both sides of the linear axis. Furthermore, additional stations can be installed along the linear axis, for example to enable the robot to rework components. In this way, the robot can use the non-productive times while the machine tool is working, for example to perform down-stream work steps. The integration of the robot into the machine environment is implemented using the Siemens Easy Connect interface.

Machining tasks easily programmed and precisely executed

In addition to conventional loading and unloading tasks, robots are increasingly also being used for machining tasks, such as drilling, milling and deburring. In order to make programming and integration of the robot as easy and user-friendly as possible for the operator, KUKA has been offering the KUKA.CNC software package for several years now. This software allows the robot to be programmed directly in G-code, without the need for compilation into the robot language. In close cooperation with Siemens, we have now taken the next step towards programming KUKA robots for machining tasks. The KUKA.CNC Sinumerik 1.0 software package has been jointly developed. It enables easy interfacing of the KUKA robot with the Sinumerik 840d sl machine tool controller from Siemens. Path planning of the robot is carried out easily and straightforwardly using the Siemens CNC controller. In this way, complex processes on the robot can also be supported using high-performance NC functions. Programming is carried out in the usual manner by means of G-code or programming cycles. If the robot is used in a hybrid group with a machine tool, the robot can be programmed and operated directly on the controller of the machine tool.

Fast, compact and robust: the KR AGILUS Waterproof.

Compact, precise, agile and fast: the robots of the KR AGILUS series are the masters of speed. When it comes to handling tasks, especially Pick&Place, the KR AGILUS offers impressive results combined with minimum cycle times. At the same time, the small robot family works with great precision, enabling manufacturing quality of the highest standard. Its speed and accuracy make the performance of the KR AGILUS unique in its payload category. The product portfolio includes robots with a payload of 6 and 10 kg and reaches of 700, 900 and 1,100 mm. Thanks to the waterproofing, the KR AGILUS is also right at home under intensive outdoor production conditions. Stable stainless steel covers, resistant surface treatments and additional seals in the interior of the 6-axis robot enable the robot to be used in a machine tool environment that has previously been too harmful for a precision robot on account of the high external stress factors, such as swarf, cooling lubricants, water spray or oil. The waterproof version of the KUKA small robot complies with the higher protection rating IP67.

KUKA Robotics UK Ltd
Tel: 0121 505 9970
Email: sales@kuka-robotics.co.uk
www.kuka-robotics.co.uk

FANUC breaks its own record with the world's strongest robot

FANUC, the leading global provider of factory automation and industrial robotics, broke its own record when it launched the world's strongest robot at this year's EMO manufacturing trade show in Milan.

The M-2000iA/2300 can lift a staggering 2.3 metric tonnes and has a powerful IP67 wrist, enabling the robot to twist and turn entire car bodies by their side. The robot can reach over 3.7 metres and has a 6-Axis to handle extreme heavyweight materials.

The M-2000iA/2300 operates within a variety of industries, performing both simple and complex tasks. In particular, its power and range make it ideal for the automotive industry and forgeries. The M-2000iA/2300's accuracy and flexibility of control also lowers the risk of damage to production material, while reducing running costs and increasing speed of production.

Tom Bouchier, managing director at FANUC UK comments: "To be known as the company that has produced the strongest robot in the world isn't just about setting new records. We are continuing to push the boundaries of what is possible to provide a greater level of service for our customers. The robot is not only the strongest in the world but it is intelligent and agile, bringing increased flexibility and productivity to the production line, as well as increasing safety and improving the welfare of employees."

FANUC is a leading global manufacturer of factory automation and industrial robotics. FANUC UK offers the most complete range of industry-leading products and services for robotics, CNC systems and factory automation solutions, helping to transform the manufacturing industry through innovation in automation.

FANUC Robotics (UK) Ltd
Tel: 024 76 639669
Email: @fanucrobotics.co.uk
www.fanucrobotics.co.uk

ETG expands its portfolio into robotics

The Engineering Technology Group (ETG) has expanded its partner portfolio by becoming the UK distributor for Halter CNC Automation B.V., the Netherlands based supplier of machine tool robotic loading and unloading systems.

Sitting alongside its machine tool and workholding products, ETG believes the addition of Halter will further expand its turnkey, FMS and machine automation capabilities, which are increasingly an integral part of customer specifications.

ETG has a significant Operations and Engineering division based on its Wellesbourne, Warwickshire facility which designs and assembles automation systems for use with the range of market leading machine tool brands it represents.

Halter products have increasingly become integral to ETG's automated loading and unloading technology, but in becoming its UK distributor, ETG is able to offer solutions, design and supply systems to suit any CNC machine.

Best known for its 'Load Assistant' which uses a Fanuc robot arm with the Halter smart control and smart loading system, Halter CNC Automation B.V. has over 25 years' experience in supplying robotic solutions to increase the productivity of machining centres.

Halter has developed a conversational interface which eliminates actual robot programming and systems being installed range from complex multi-robot installations to simple but highly effective pick and place robots. These offer manufacturers operating small and medium CNC lathes and machining centres affordable automation opportunities with the advantage that they can be moved from machine-to-machine for rapid changeover.

A feature of Halter automation systems is the simplicity of smart control programming system which does not require previous robotic experience. It is a universal system for both CNC lathes and CNC machining centres.

Steve Brown, ETG's product development manager for Halter comments: "Demand for automation systems to work with machine tools is increasing and has led to our engineers assessing the market for specialist robot suppliers.

"We have been highly impressed with Halter's all around skills in this area and as such, have agreed with them a partnership programme.

"As well as working on automation and turn keys with machines we represent we are happy to work on retrofits and upgrades, working on all models of machine tools where operator's feel they may gain better productivity through an automated component supply system."

Engineering Technology Group
Tel: 01926 818416
Email: djames@engtechgroup.com
www.engtechgroup.com

Robot application makes successful premiere at EMO

HBZ TR with SINUMERIK controlled KUKA robot "CNC and robotics all operated by SINUMERIK" is the official slogan of the two strategic development partners Siemens and KUKA, who successfully developed the intelligent interface Run MyRobot / Machining in order to simplify the connection of robots to machine tools and to optimise processes.

Acting as a launch customer, German machine tool builder Handtmann A-Punkt Automation GmbH presented its 5-axis horizontal machining centre HBZ Trunnion 80 equipped with SINUMERIK controlled robot automation for the first time ever in public at this year's EMO in Milan. The feedback related to the innovation in the field of integrating robots to machine tools has been consistently positive.

This new innovative automated solution is much more than simple material handling by using a 6-axis robot as one could assume at first glance. The key point is the central operation of the robot by using the machining centre's control. This "one point of operation" as Oliver Altenburger, key account manager at Kuka Roboter GmbH, states is one of the main advantages besides the fact that no special robot knowledge for programming and control are necessary.

All processes can be programmed, controlled and monitored with the Siemens CNC SINUMERIK 840D sl by using the G-code. The new interface allows to synchronise processes between machine and robot easily which provides for efficient processes in the automated handling cell.

"As the connection of the robot to the machine via the interface allows machining operations outside of the machine's work-zone as well, we realise further potential to increase productivity as workpiece costs can be reduced", states Oliver Altenburger.

The economic system for material handling and secondary operations such as drilling, brushing, deburring and polishing of parts with a maximum total workpiece weight of 600 kg parallel to the machine's main time provides for efficient production. The whole handling cell is easily controlled by the machine's control panel and robot mechanisms are seamlessly integrated into machine concept and production processes. No special robot knowledge is needed, neither for material handling nor for machining. The cell is completely illustrated in a CAD/CAM CNC chain by the new Siemens NX CAM robotics programming solution. Significant added value in 5-axis simultaneous machining is guaranteed due to easy and automated workpiece handling parallel to machining which provides shorter cycle times and high machine utilisation.

Daniel Restel, project specialist at Siemens AG and directly involved in the project implementation, confirms the positive impression of the newly presented innovation in the area of automated machine tools: "The Handtmann HBZ Trunnion 80 with the via SINUMERIK controlled KUKA robot has been a highlight at this year's EMO. Also Siemens colleagues who are responsible for other machine manufacturers were impressed by this solution. We were able to gather impressions in the area of the omnipresent trend of digitalisation and automation on many booths. The Handtmann machine complies in this respect with the requirements of tomorrow. Important issues could be realised such as complete integration into a Product Lifecycle Management, the combined control of robot and machine via SINUMERIK operate as well as increase of value creation in production."

Following the industry's trend of automation for machining centres, this is not at all complete new territory for Handtmann A-Punkt, but has rather been a big issue for years already, whereas its importance is continuously increasing. For years the company has been developing customised solutions for automation as for example simple solutions for changing two pallets (HBZ CompactCell, HBZ Trunnion), pallet changer including a pallet rack for 48 pallets or more/less (HBZ CompactCell), linking of several machines including pallet racks and RGV (HBZ AeroCell), portal handling systems, robot based automated solutions and many more.

The Handtmann Company Group stands for tradition over more than 140 years and, at the same time, for innovation and development, with a total of 3,000 employees worldwide today. The Handtmann Group is headquartered in the Swabian city Biberach an der Riss and comprises six companies and a holding company.

HandtmannA-Punkt Automation GmbH
Tel: 0049 751 5079 754
Email: sales.apunkt@handtmann.de
www.handtmann.de

Humanoid robot cooperation is effective even in small spaces

During the recent EMO Milan 2015 exhibition, Comau showcased AMICO, a special cell showing the new concept of a human-like robot developed by the company.

AMICO, available in a new colour combination, which turns it into an object of pure technology, style and design, is positioned to clarify and emphasise Comau's next steps towards increasingly precise and effective robotics. It's a future in which machine-machine cooperation and, progressively, man-machine cooperation, evolves from a mere hypothesis to a real production opportunity that can be applied in total safety.

A further particularity of the cell is the gripping mechanism. The arms of AMICO feature two SCHUNK SDH2 grippers, a multi-articulated gripping system with three fingers and the ability to grab a wide range of objects, which makes it perfect for robotic industrial applications. Two of the SCHUNK gripper fingers can, in fact, change their orientation to adapt to a wide variety of applications. The gripper is also able to recognise each surface and release the necessary strength through a specific sensor. In addition to extreme precision, this allows the robot to immediately understand whether the gripping is optimal or should be adjusted. AMICO is a technical and communicative concept chosen by Comau to represent the robot's ability to work in small spaces with the maximum precision and flexibility. Based on Racer3 technology, it also demonstrates the possibility to mount Racer3 in any position and the clever mix of technology and design that characterises Racer3 and enables it to bend and reach the surrounding space.

This robot, which has recently been presented to the market, is the symbol of the new Comau-made robotics paradigm.

Built entirely in aluminum and magnesium, Racer3 weighs just 30 kg and features a maximum reach of 630 mm and a payload of 3 kg. As such, it is perfect for applications including assembly, material handling, machine tending, dispensing, pick and place, etc., which require the maximum precision and velocity in small work spaces.

View the video at:
https://www.youtube.com/watch?v=NGcu1-_E4Hk

Comau is a worldwide leader in manufacturing flexible, automatic systems and integrating products, processes and services that increase efficiency while lowering overall costs.
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Low-cost robot puts on weight

With 93 percent of manufacturers still saying that robotics are not for them, it is refreshing to report that a pair of UK innovators have come up with a low-cost solution in the shape of the EVA robotic arm with easy-to-use software.

Automata Technologies was founded in January 2015 by Mostafa ElSayed & Suryansh Chandra. They have both been working at the intersection of design, technology and digital manufacturing for over seven years and understand the challenges and opportunities this space presents.

As they explain: "We want to democratise robotics for the SME & consumer markets by providing affordable and easy to use robots and software.

"We believe robotic automation can bring a huge amount of creativity in addition to enhancing productivity to small businesses and individual users. Over the coming years, these will change the way we live and work. But first, these robots need to become a whole lot easier to use, safer to work beside, and substantially more affordable. Eva is our first product in our commitment to meet those goals, by being a low-cost, easy to use and lightweight robotic arm. We like to think of Eva as an assistant that can give you a helping hand in a variety of uses whether you're a business, hobbyist, or an educator."

Based on user feedback and in-house testing, the pair recently presented the latest version Eva-9 at the First Friday Editors' Club in London. The ninth prototype is now awake and ready to go through long hours of repeatability, precision and payload testing.

Eva-9 is now three times stronger and four times more accurate than Eva-8. If calculations are correct, she should be able to lift 650 gm to 900 gm based on outreach, and be repeatable down to 0.25 mm. In the process, Eva-9 has put on some weight, and weighs in at 2.2 kg. These numbers will be tested and confirmed over the coming months.

These improvements will open her to a wider range of applications not possible with Eva-8 and if all goes according to plan, the new version will be available within a price range of $2500-$3500.

With 13 installations in 16 weeks, Eva is certainly putting low-cost automation firmly on the map.

Automata Technologies Ltd
Email: info@getautomation.com
www.getautomation.com

Change of strategy brings productivity boost

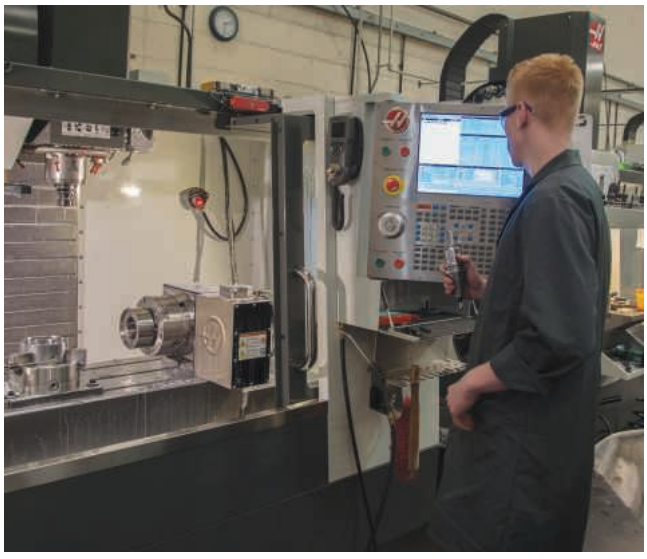
BDL Tool & Die Engineering is transforming itself from a specialist manufacturer of specialist fastener dies into a full service subcontract engineering company. This change has brought with it certain challenges that are being met with the help of suppliers such as WNT (UK).

With extensive experience in the tool and die sector BDL Tool & Die Engineering is using it to good use developing its customer base, adding precision general engineering to its portfolio. With its knowledge of machining hard materials such as high speed steel and even tungsten carbide it has focussed much of its attention on industries with similarly challenging materials. One in particular, the sub-sea hydraulics industry has proved to be responsive to BDL's skills set, leading to a growth in turnover of over 50 percent in the past 12 months and significant investment in its machining capacity.

"Like many companies we had to cut back during the crash and this made us take stock of the direction we wanted to head in, once things started to improve. The decision to expand on our traditional business and open up our manufacturing to more general engineering has proved to be a good decision. We now work for a diverse range of industry sectors, including aerospace, automotive, and motorsport, where we are an A1 approved supplier for one of the leading engine manufacturers. However it has been the hydraulics industry that has given us our biggest area of growth, particularly sub-sea, which given the present situation with oil price is more pleasing," says Phil Morris, BDL Tool & Die Engineering's managing director.

As a result, the business has increased the number of employees to 60 and has taken on apprentices to bolster future skills levels. In addition, the last two years has seen the arrival of ten additional CNC machines, including 5-axis machining centres. With these new customers also came new challenges and when a new contract from a hydraulics customer was won it became apparent that new machining methods would be needed to make it financially viable.

BDL turned to WNT and its technical sales engineer Warren Howard who reviewed the existing process and arrived at a new machining strategy and tooling package that significantly reduced the cycle time and reduced tooling costs. Originally BDL's CNC milling supervisor Dan Green had put the job onto a 5-axis machining centre and was using indexable insert tooling to rough and finish mill the deep pockets and cut outs in the component. The resulting cycle time was four hours per part. "With Warren working alongside us we looked at the process and he came to the conclusion that the way forward was to switch to solid carbide tools, move the part from the 5-axis machine to a four-axis machine and change the whole strategy'' says Dan Green.



The main change was to use a trochoidal milling technique, taking lots of smaller cuts, but at much higher feedrates using a 16 mm WNT HPC cutter with a 2 mm corner radius with additional cuts being taken with a WNT 12 mm ball nose cutter. The cutting data for the main milling operation was 3500 revs/min (175 m/min) and a feedrate of 2500 mm/min (0.15 mm/tooth). Depth of cut was 28 mm and the step over was 2.4 mm or 15 percent of the cutter diameter. Switching to a trochoidal approach produced a much softer cutting action that resulted in not only reduced cycle times, but also extended tool life. With the indexable inserts the tips had to be indexed after every component, with the switch to solid carbide and the trochoidal milling each cutter lasted for five components before it needed regrinding. Cycle time fell from the original four hours down to 1.5 hours and the quality of the parts also improved as the new milling strategy eliminated the step-over marks left by the previous indexable insert cutters.

WNT (UK) Ltd
Tel: 0800 073 2073
Email: tony.pennington@wnt.com
www.wnt.com

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Unravelling a turning dilemma with new ranges

Dormer Pramet has introduced two new positive geometries and grades for turning applications in Difficult To Machine Materials (DTMM).

Suitable for a variety of turning applications, the SF and SM geometries have been launched to support the machining of materials such as high temperature alloys and stainless steel.

Part of Dormer Pramet's second product launch of 2015, the SF geometry features a sharp, positive rake of 14.5°. It is suitable for finishing applications in continuous cut with very low forces.

The SM geometry has a positive rake of 13° and is a wear-resistant, universal geometry for medium machining (finishing up to roughing) and suitable for continuous and interrupted cut.

Both geometries are available in a variety of grades and have been designed to promote low cutting forces and prevent work-hardening. This helps to reduce the risk of vibration when turning thin-walled components.

In addition to the new geometries, two new turning grades have been unveiled by the global cutting tool manufacturer.

The PVD coated T6310 grade features a special sintering process which enhances cutting edge reliability and strength. Its new substrate with intermediate cobalt content provides additional hardness and increased abrasion resistance to offer greater reliability and prolonged tool life.

The T6310's triple coating provides durability for higher cutting speeds used when machining stainless steel, heat-treated and hardened materials. It is suitable for use with the new SM and SF geometries, as well as Pramet's existing NF and RM geometries, with a total of 89 inserts now available.

Josef Bittner, product manager for turning at Dormer Pramet, says: "The thermal conductivity of stainless steel, nickel and titanium tends to be low, but with high cutting speeds and feeds required during machining, the cutting edge can quickly become overheated, shortening tool life.

"Machining with coolant reduces these effects, but the constant change of temperature at the cutting area causes heat stresses, resulting in thermal cracks and, again, poor tool life.

"We therefore saw a need to create a new grade with the right combination of substrate and coating to enhance resistance to thermal cracking. Our new T6310 grade achieves that objective."

Meanwhile, Dormer Pramet's new H07 uncoated grade offers good heat conductivity and high wear resistance required for turning titanium and alloys. Its fine grain substrate with low cobalt content offers resistance to pitting as well as plastic deformation. It is available in the new SF geometry.

Josef Bittner says: "These latest products will be of use in extreme environments where they are subjected to tremendous heat and corrosion, for example in the general machining, oil and gas, automotive, medical industry, marine and power generation sectors."

An overview of all the new indexable ranges launched by Dormer Pramet are available in its latest product brochure, to order a printed copy or for more information contact your local Dormer Pramet sales office.

Machining stainless steel? Look to Pramet

A variety of milling, turning and hole-making applications are covered, including: New face milling cutters and inserts. The program includes OEHT (octagonal), REHT (round), and XEHT (wiper) inserts, as well as a new double positive 45° milling cutter. Also, three new positive geometries have been introduced for use with the OEHT inserts; New positive geometries and grades for turning applications in difficult to machine materials; New shoulder milling cutters, geometries and inserts, primarily for stainless steel, but also super alloys, low carbon steel and non-ferrous materials and a new chip-breaker designed to provide a more stable and reliable drilling process in low strength soft and long-chipping materials.

The merger of round tools manufacturer Dormer Tools and cemented carbide tooling specialist Pramet Tools was instigated in 2014. The combined product programme now encompasses a comprehensive range of rotary and indexable drilling, milling, threading and turning tools for the general engineering sector. An expanded sales and technical support service extends to over 30 offices serving more than 100 markets worldwide. These are supported by state-of-the-art production facilities in Europe and South America and a global distribution network consisting of five strategically placed hubs.

Dormer Pramet
Tel: 0870 850 4466
Email: simon.winstanley@dormerpramet.com
www.dormerpramet.com

New solid-carbide end mills

Seco Tools has recently expanded its already comprehensive line of Jabro®-Solid² end mills to include new cutting tools that enable customers to employ significantly higher feed rates and achieve higher metal removal rates during roughing operations. The Jabro-Solid² range has also been further extended to include new long-length tools for machining thin wall parts made from aluminium.

JS554-2C universal solid-carbide end mills enable customers to achieve the highest possible feed and metal removal rates during advanced roughing applications.

Featuring the advanced SIRA coating and a stable tapered-core design, JS554-2C tools can perform high-radial width of cut operations which help reduce the number of roughing passes required and help shorten part cycle times. Furthermore, JS554-2C end mills can undertake rough side-milling operations using its entire 2.5*dc cutting length. Used in conjunction with the applied chip splitters the JS554-2C tools produce short chips which can be easily and reliably removed from the cutting zone and, as such, are ideal for manufacturers involved in unmanned operations.

When compared to other tools in the range, JS554-2C end mills feature enhanced positive frontal teeth geometries with increased chip room for more effective and improved axial helical interpolation operations.

JS554-2C tools are available with cutting lengths of 2.5 x D and provide manufacturers with the option to select straight shank diameters from 4 mm to 20 mm, or Weldon shank diameters from 6 mm to 20 mm.

JS452-L long-length solid-carbide end mills deliver increased stability and process reliability when machining thin-wall aluminium parts. The tools also make it possible for users to machine these parts at extremely high speeds.

Featuring a polished HEMI Titanium DiBoride (TiB2) aluminium-inert coating, with a low friction coefficient, JS452-L tools exhibit minimal material adhesion/build-up, thus improving tool life. The coating also ensures effective chip removal and heat evacuation from the cutting zone. JS452-L end mills comprise 54 long-length options with diameters ranging from 8 mm to 20 mm, corner radii ranging from 0.2 mm to 6 mm and are available in both Weldon and cylindrical shank mounting styles.

Furthermore, an extra gash on the tools' cutter geometry helps maintain the best possible radius form as well as contributing to optimised chip flow, a real advantage when machining aircraft structural components.

Seco Tools (UK) Ltd
Tel: 01789 764220
Email: mike.fleming@secotools.com
www.secotools.com/uk

Komet agrees service contract with Exactaform

Internationally recognised as a leading technology and innovation expert in high-precision cutting tools, the Komet Group is supported globally by service partners that can service and manufacture Komet products in local markets. To bring this local manufacturing and servicing facility to the UK shores, Komet UK has signed a franchise agreement with Coventry based Exactaform.

For Komet customers, the agreement will result in quotations, tool production and product delivery being processed in the UK for all Komet solid carbide milling and reaming lines, as opposed to being processed in Germany. By committing to this franchise agreement, Komet UK customers will benefit from faster quotations and turnaround times on standard and special products. Customers will also have the facility to benefit from a re-grind service.

The agreement was signed on September 18th as, Komet UK's managing director, Steve Kirk explains: "We have been working on finding a service partner capable of achieving and delivering our uncompromising commitment to quality and service for the last three years; and we've certainly got that with Exactaform. Komet has over 30 service partners worldwide and we are delighted to welcome Exactaform as the latest member of this prestigious group of partners. The agreement will benefit both parties, with Komet benefitting from the expertise and locality of Exactaform to manufacture and re-grind our products in the UK. Furthermore, having a UK service facility will streamline our processes from quote to delivery and even through to after sales services such as re-grinds. For Exactaform, they will benefit from our sales network that will enable the PCD tooling experts to grow their carbide tooling division by providing access to a wider target audience."

What about the Komet quality?

For Komet customers that are unfamiliar with Exactaform and concerned with the delivery of Komet quality products, don't be concerned. As a Komet Service partner, the agreement gives Exactaform access to all the production programs and technical specifications of the Komet solid carbide lines. This ensures that all Komet products manufactured by Exactaform are produced from solid carbide of identical specification to the exact geometry designation and with the identical coating condition.

Steve Kirk concludes: "This business model has been working globally for Komet for over 5 years, as it benefits the local Komet subsidiary as well as the service partner. Exactaform has some of the most technologically advanced machine tools in the world for producing cutting tools and these are backed by decades of cutting tool expertise. It is these factors that have made Exactaform a formidable brand in the PCD cutting tool industry in both the UK and overseas. We are delighted to have a service partner of such kudos."

With its brands KOMET®, DIHART® and JEL®, the KOMET GROUP is a worldwide technology leader in high-precision drilling, reaming and threading. With outstanding creativity, the company develop, produce and distribute specific customer solutions and premium products for all stages of production.

KOMET UK Ltd
Tel: 01827 302518
Email: Info.uk@kometgroup.com
www.kometgroup.com

Delivering improved hole quality and longer tool life

Sandvik Coromant has launched a reinforced variant of its CoroDrill® 880 indexable drill that will substantially improve production economy in large diameter hole-making applications. The latest CoroDrill 880 tool body is compatible with a range of insert grades, including a grade based on the company's new Zertivo™ technology, which delivers optimised cutting edge integrity.

Representing the latest breakthrough in U-drill evolution, the reinforced CoroDrill 880 features a new enhanced drill body that is up to 30 percent stiffer than its predecessor for applications of four to five times the drill diameter. This gives a more reliable drilling experience and a much better hole quality. In addition, the combination of enhanced drill body and the new Sandvik Coromant grade chain for steel and cast iron results in a considerably improved insert tool life.

In tests, a customer manufacturing slewing rings for the wind power industry tried the new and improved tool body for CoroDrill 880 in application requiring holes of five times the drill diameter. When using the old tool body in 42CrMo4, the hole size decreased over time providing an undersized hole after a period of use. With the new, stronger tool body, CoroDrill 880 produced correctly sized holes for a much longer period of use. In addition, the customer saw a tool life increase of 975 percent.

Two of the insert grades, GC4324 and GC4334, are designed with Inveio™ coating for better wear resistance. The third, GC4344, produced with Zertivo technology, provides great edge-line security as a result of optimal coating and substrate adhesion properties.

These three grades complete the full grade chain with solutions for all ISO P and ISO K materials and a large variety of applications: GC4324 productivity booster for stable conditions; GC4334 first choice for good to average conditions and GC4344 for excellent performance in difficult conditions.

The new grade positioning is designed to make it easier to select the right grade from the start. The CoroDrill 880 product range covers hole diameters from 12 to 84 mm (0.472-3.307 inch) off the shelf, as well as engineered solutions up to 129 mm (5.078 inch). The drills produce holes with tolerances of H12–13 and are suitable for holes up to five times the drill diameter.

Sandvik Coromant
Tel: 0121 504 5400
Email: uk.coromant@sandvik.com
www.sandvik.coromant.com/uk

Enhanced performance for plastics machining

Precision tooling expert MAPAL has developed a new drill optimised to overcome the challenges of thermoplastics drilling. The Mono-Plastic-Drill is ideally suited for use with PEEK, POM or PA 6, as well as other materials with low thermal conductivity and low melting temperature that make machining difficult.

With the new Mono-Plastic-Drill, manufacturers in a variety of industry sectors can reach new performance levels for machining modern plastic materials.

The Mono-Plastic-Drill has been designed with special properties, including an extremely sharp blade and special point thinning. As a result, bore tolerances up to IT7 are achieved.

To optimally dissipate the heat via the chips, the drill is made of uncoated solid carbide and has a large, polished chip flute. As a result, thanks to the special carbide substrate, the Mono-Plastic-Drill also has exceptional rigidity and wear resistance.

The new solid carbide drill provides excellent performance even in dry drilling conditions, as the geometry and the special chip flute prevent smearing of the material. It addition to using it for plastics machining, the Mono-Plastic-Drill can also be used to machine aluminium parts.

MAPAL's new Mono-Plastic-Drill is available with a diameter range of 0.97 to 13.03 millimetres and lengths of up to five times its diameter.

One-shot solution for conrod bores

MAPAL has also developed a new solid carbide step drill that is specifically optimised for producing screw and tap bores on connecting rods. By allowing the bores to be produced in a single machining step, rather than the two steps previously needed, the new drill significantly reduces both machining time and costs.

A further benefit is that with the new drill, the threaded through hole and threaded tap hole are produced by the same tool. This means that there is no possibility of misalignment of the two sections, and that the overall bore quality is considerably improved.

The tool's special geometry, coating and edge preparation, together with the use of four guide chamfers ensure optimum process reliability with very high performance and tool life. A further innovation is a newly developed chip guiding stage (patent pending), which means that only short spiral chips are produced at the countersink diameter. These chips are easily discharged and cannot wrap around drill or chuck.

MAPAL
Tel: 01788 574700
Email: sales@uk.mapal.com
www.mapal.com

Leader supports multi-axis manufacturing

Leader Chuck Systems has recently added the Exact Machinery range of precision CNC rotary tables and indexing units to its extensive product portfolio. The Taiwanese company has over two decades experience, continuously developing new and innovative products to improve the manufacturing processes and productivity for precision engineering companies in every industrial sector. The ISO 9001 accredited 180-strong company produces over 3,000 units each year at its 4,800 m^2 state-of-the-art manufacturing facility.

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

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

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

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

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

Leader's managing director, Mark Jones says: "Exact is a professional global supplier built on a robust technological research and development foundation, complemented by a quality minded workforce using state-of-the-art manufacturing equipment and a stringent quality control system. Like Leader, the company is committed to finding a solution that achieves or exceeds customer satisfaction."

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

Based in Tamworth, Leader Chuck Systems has an enviable reputation for the in-house design and production of Leader chucking, stationary clamping, gripping and workholding products. A respected brand name for high quality equipment with more than 60 years' experience, the company also stocks products from the very best suppliers, such as AutoGrip, Bison, CARVEsmart, Exact Machinery, Gamet, Hainbuch, Hewa, Iram, Lexair, Maprox, MicroCentric, Orange Vise, Posistop, Walmag Magnetics, ZeroClamp and Zweifel. Able to provide the right chuck or gripping solution for any application, Leader Chuck offers quality, precision, and reliability at competitive prices with reliable expert advice and a commitment to customer service.

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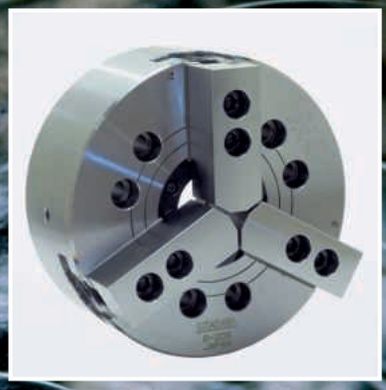

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Improved workholding speeds

In the prototyping department and toolroom at BNL (UK), a leading British manufacturer of plastic bearings and gears, machining lead-times are much shorter following the purchase of a pair of Chick One-Lok CNC vices through sole UK agent, 1st Machine Tool Accessories (1st MTA).

The workholding units, which arrived in August 2015, have replaced conventional wind-up vices on two Hurco machining centres at the Knaresborough factory in North Yorkshire. Not only are workpieces secured faster, but repeatability and safety are also improved.

BNL's toolroom supervisor Chris Hargraves says: "With a conventional vice, the movable jaw tends to ride up when a part is clamped, so you have to use a mallet to tap it down.

"Then you usually have to tap the handle to make sure the part is fully secured.

"We machine up to 50 plastic components at a time here and it was a time-consuming process that is no longer required with the One-Loks."

He explained that the controlled clamping action produces a pull-down effect as the jaws close, so components are always seated firmly after the handle is tightened by hand. Positioning of the components is also more precise, so machining is more consistent from batch to batch.

Choice of soft or hard jaws

Hard (steel) and soft (aluminium) quick-change Chick jaws with a special machined recess on the reverse are provided through 1st MTA for the Chick One-Lok workholding system.

Hard jaws, either plain or stepped, are used when rectangular workpieces are being clamped, such as when machining impressions in tool steel moulds, profiling copper electrodes and milling aluminium fixtures for product assembly.

Soft jaws come into their own when round or awkwardly shaped components such as injection moulded plastic parts are being machined. The jaws are milled to accommodate multiple such parts and as the shape matches perfectly, they are held securely and without damage. It is never necessary to over-tighten and job setup for repeat batches is rapid, as the jaw sets are stored for re-use.

Soft jaws cannot be used on conventional vices, which presented BNL with a number of problems. If parts were round, only two could be clamped as a third would un-doubtedly not be secure. There was also a risk of marking delicate surfaces.

Avoiding these drawbacks entailed laborious manufacture of a bespoke fixture or a profiled block that sat low in the vice for holding the parts. An alternative was to clamp the parts directly to the machine table, but this also took time.

Although the prototyping section and toolroom are not production environments, they are nevertheless busy. Some customers expect work to be turned around in two days. Avoiding repeatedly losing time when fixturing components has been a major boost to productivity ever since the Chick One-Loks were purchased. Moreover, as the units are sealed against ingress of coolant and swarf, downtime for maintenance is rare.

On top of all these advantages is the speed with which the units can be closed to secure a component. It takes anything up to a minute to wind the handle of a normal vice up to 70 turns if the jaws are wide open and a small part is being clamped. By contrast, a ratchet system on the One-Lok allows the movable jaw to be positioned instantly to within a few millimetres of closure, after

which the clamping action is completed with just a few turns of the removable swivel wrench.

In conclusion, Chris Hargraves pointed out an additional benefit of the One-Lok design, namely that 1st MTA offers outboard hard jaws that can be used to extend the clamping range from 203 mm to 432 mm, allowing larger parts to be machined. BNL produces aluminium fixture plates for which the optional external clamping arrangement is useful.

1st MTA Ltd
Tel: 01725 512517
Email: enquiries@1mta.com
www.1mta.com

Buck Chucks gets to grips with ETG

ETG Workholding, the dedicated division within the Engineering Technology Group with the UK's largest portfolio of workholding and specialist metal cutting accessories now offers the comprehensive range of Buck Chucks which are available in manual, powered and high precision options.

For over 75 years Buck Chuck USA has engineered and built high quality workholding products. Now part of the Hardinge Group, Buck Chucks legacy products are the ATSC and AT Ajust-Tru self-centring manual scroll chucks alongside high precision and power chucks.

Most recently it has expanded its range with the introduction of a new ATSC range and improvements to the AT products.

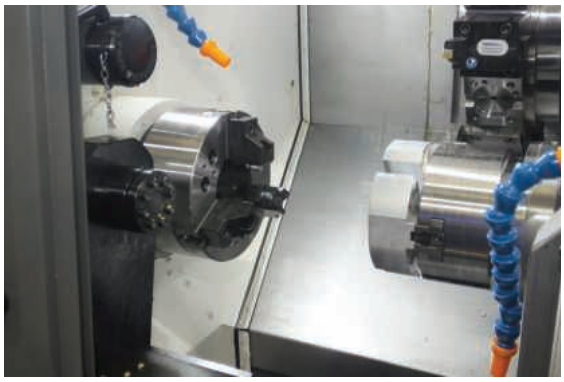
ATSC now features micro-fine adjustment to allow .0005" TIR repeatability and a high quality forged steel body construction to allow for higher lathe speeds. The hardened and ground scroll is now precision balanced allowing longer life and greater accuracy.

The upgraded AT chuck is based on the much copied Buck Chuck Ajust-Tru design with the new upgrade featuring a larger through hole and higher-quality cast iron workpiece material. AT semi-steel body manual scroll chucks are available in three and six jaw master and top reversible options.

All steel bodied ATSC products are made to strict ISO standards and have the Buck Chuck trademarked Ajust-Tru feature.

Finally, for extra heavy duty applications there is a range of three jaw scroll or four jaw independent style oil country chucks available in 25" (89 cm) to 80" (100 cm) capacities with solid or American standard tongue and groove jaws. For internal and external chucking operations, oil country chucks are available in steel or cast iron body specifications.

The addition of Buck Chucks to the ETG Workholding range complements the existing collet systems available which include the Hardinge FlexC quick change system and the Hardinge traditional style C style collet chuck.



Buck Chucks fitted with different jaws; (left) Schunk claw jaws and (right) aluminium 'pie' jaws

For further details on ETG Workholding visit the dedicated website:
www.ETGworkholding.com

Engineering Technology Group
Tel: 01926 818416
Email: djames@engtechgroup.com
www.engtechgroup.com

Clamping in seconds with magnetic technology

Roemheld's tried and tested magnetic clamping technology enables die changing on automatic punching machines and presses to be carried out in minutes, thanks to clamping times of just two to three seconds. As a result, the M-TECS range is ideal for the decreasing small batch sizes and increasing variety of workpieces that the sheet metal and plastic processing industries need.

This flexible, universally applicable magnetic clamping system also means that no standardisation of dies is required. While clamping times of between two and three seconds are resulting in decreased downtime, reduced setup costs and higher productivity.

The Roemheld M-TECS magnetic clamping system also makes clamping in hard to reach places simple. The full-surface clamping force ensures clamping with almost no distortion ensuring improved product quality and reduced wear of dies. This, in turn, means reduced maintenance costs and machine downtime.

The safety and ease of use offered by the system is also a benefit to the health and safety of the operators. The technology behind Roemheld magnetic clamping plates is based on the principle of a permanent, electric magnet, which means that they are safe: even in the event of a power failure. Electrical power is only needed for two to three seconds for the clamping of the system when starting. Once in operation, the system does not need any power until the die is unclamped. The magnetic force is built up in a very flat, highly concentrated magnetic field that penetrates the die base plate by just a few millimetres and therefore has no influence on the die, the punch or the workpiece. The magnetic forces achieved are between 2 and 12 kg/cm^2 depending on the surface as they increase in relation to the die size. Clamping forces of 500, 1000 or 2000 kN are available and can be adjusted to the machine requirements.

Roemheld's magnetic clamping technology can be retrofitted to almost all existing presses. The design of the magnetic plates is quite flexible and can be adapted to specific size and shape requirements.

Roemheld UK Ltd
Tel: 01462 459052
Email: sales@roemheld.co.uk
www.roemheld.co.uk

Flagship fixturing for Cosworth

Tamworth-based, workholding specialist Brown & Holmes has recently supplied 59 fixtures for the high performance engine manufacturer Cosworth's flagship Advanced Manufacturing Centre, which will officially open in 2015.

This contract, which is one of the largest single orders that Brown & Holmes has ever received, also includes the supply of a further number of inspection fixtures for the new plant based in Northampton. This new manufacturing facility has been designed by Cosworth to house an advanced, flexible manufacturing system for the production of complex automotive components and to help OEMs bring new innovations to the market.

Workholding and subcontract machining solutions' provider, Brown & Holmes, first received an enquiry from Cosworth for producing hydraulic fixturing in late Spring 2014. The fixtures were to be stored and managed on a Fastems 72 pallet system which would be located within a fully automated cell. The use of robots to lift the components on and off the fixture during the wash part of the process meant consideration during fixture design had to be given to how the parts would be accessed and gripped during this auto-mated sequence. It was also critical that the fixtures were monitored via air sensing to confirm that the components were correctly positioned and seated following auto loading.

Carl Baker, joint managing director of Brown & Holmes, says: "It was important to collaborate closely not only with Cosworth but also with the other suppliers: Walter, who supplied the tooling, ABB who supplied the robotics, Fastems who designed the pallet systems and Matsuura whose machines were being used within the process."

Although each fixture was designed from scratch, Brown & Holmes has a known pedigree for supplying solutions for many similar automotive components. In this instance, the complexity and size of the project meant that four Brown & Holmes in-house design engineers worked on it full time during the critical development stage. Carl Baker feels that despite the resource needed to deliver this project, Brown & Holmes did have an advantage: "We were able to draw on our years of experience in designing and manufacturing fixtures for the automotive industry. We also have a large in-house design capacity so were able to dedicate almost 50 percent of our design resource to realise this project. Our experienced team were able to utilise CAD models to good effect so all the parties involved could have as much input as needed before the final design and subsequent manufacturing took place."

As well as being fully designed and manufactured in-house at Brown & Holmes' premises in Tamworth, the finished fixtures were also tested, inspected and bought off within the facility. Carl Baker says: "It is essential as part of any design and manufacture project that all interested parties are able to visit our premises, hopefully with a component to try onto the fixtures. This allows everyone to look at the fine detail of ease of loading, possible swarf traps and cutter access amongst other things. This in turn makes the delivery to the customer so much smoother so that the fixtures perform right first time and deliver over and above customer expectations."
The finished fixtures will be used by Cosworth to machine cylinder heads, chain case covers, sumps and cylinder blocks for three major car and sports car manufacturers.

The fixtures have been delivered on a phased basis since April 2014 and the project is due for completion towards the end of 2015. The inspection fixtures, which have only recently been ordered, will be delivered on an ongoing basis. The project has run to schedule, which has been attributed to the good working relationship that Brown & Holmes has enjoyed with Cosworth throughout. Carl Baker explains: "Despite the size of the undertaking it has been a very smooth process with an

excellent flow of information from all sides. The Cosworth team has been an absolute pleasure to work with."

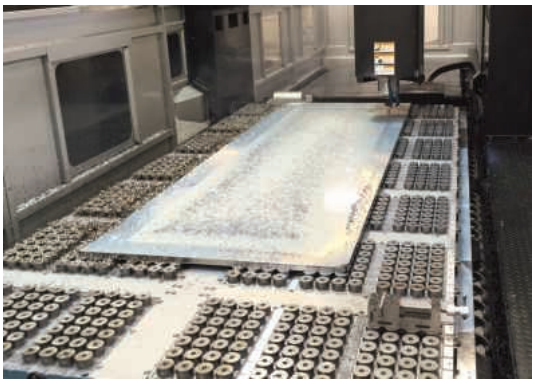
With Brown & Holmes currently looking at future projects for Cosworth, the strong working relationship between these two companies seems set to continue into the future.

Cosworth employs its motorsport-inspired engineering and manufacturing capabilities to improve vehicle and driver performance. The group supplies electronics and powertrain products and engineering services to high performance vehicle manufacturers, motorsport teams and performance enthusiasts around the world. Cosworth was founded in 1958. With headquarters in Northampton, UK, the group has a globally-recognised brand and employs staff across Europe and the USA. Cosworth can be found at **www.cosworth.com**

From its Tamworth base, Brown and Holmes provides customers with a complete turnkey solution from project management, design and manufacture through to support and installation. Brown & Holmes was established in 1939 and its solutions now cover a wide range of industries including aerospace, automotive, defense, pump and valve and the oil sector. Brown and Holmes is ISO9001:2008 and IS0 14001 accredited.

Brown & Holmes
Tel: 01827 63591
Email: info@brownandholmes.co.uk
www.brownandholmes.co.uk

Europe's biggest magnetic chuck supplied to TRP Sealing Systems



In order to offer its customers shorter lead times on products, TRP Sealing Systems Ltd has recently setup a purpose-refurbished tool room to carry out the manufacture of mould tools. As part of this, the company has invested in a new 'WELE Large Bridge' machining centre from 2D CNC Machinery, which will enable them to integrate larger mould tool operations in house.

As part of the mould tool manufacturing process, TRP Sealing Systems Ltd required an effective method of securing steel plates. Thin plates of good quality steel are used in the manufacturing process, ranging in size from between 16 mm to 30 mm thick. Plate dimensions range from 860 mm by 830 mm to 3900 mm by 1750 mm.

The company required an application that would allow them to accurately machine both faces of the steel plate and all edges. In order to avoid inherent warping in the plate, which carries the possibility of compromising the precision of the tools, the plates need to be secured in such a way that they are perfectly flat when processed. Eclipse Magnetics was able to offer TRP Sealing Systems Ltd a solution in the form of a bespoke electro-magnetic chuck; a magnet bed supplied in 14 sections. The overall size of the Power Matrix Milling system is 4,000 mm x 2,000 mm x 66 mm high, which fills the table. Each chuck has different groups of individual magnetic islands 50 mm x 50 mm in size, which are placed in position in order to provide clearance for drilling and milling.

Eclipse Magnetics supplied the magnets including a fixed, full steel, working top plate that would provide the known height for the components, ensuring that the Z-axis is constant in all instances. A solid platform was created using 14 chucks, including controllers to switch all chucks in set zones. This allows the operator to effectively switch on the area of the platform that is required, and can be removed by using a key switch inside the controller. This setup also allows cable runs between the chucks to the rear edge of the table, providing sufficient protection from damage. Small gaps between the chucks are covered with stainless steel cover plates in order to protect the cables from coolant and swarf ingress.

Eclipse Magnetics
Tel: 0114 225 0600
Email: info@eclipsemagnetics.com
www.eclipsemagnetics.com

Filtermist buys and supplies centralised fume extraction system

Industrial extraction specialist, Filtermist became its own client recently with the installation of a centralised Absolent welding fume removal system at its new production facility.

Filtermist moved to the £3 million purpose built premises in July 2015 to ensure it could meet the growing global demand for its oil mist filters. Sales have increased by 300 percent since 2000 and this trend is continuing due to the company's focussed efforts on increasing its share of key markets around the world.

Absolent A dust 5 unit; Filtermist oil mist collectors, perforated internal drum with welded seam

Filtermists currently exports to more than 60 countries worldwide and every single unit is manufactured at the 1,920m² Telford factory. With the company's core remit 'protecting people through cleaner, safer workshops', it was vital that Filtermist heeded its own advice when it came to ensuring the air in its own facility is clean.

Managing director James Stansfield, explains: "We wanted our new production facility to be as airy and light as possible to provide a modern working environment for our engineers, as well as our office based staff.

"The need to provide clean air was an obvious necessity and when it came to fume extraction, our sister company Absolent was clearly the ideal choice!"

Welding forms a significant part of the production process of each Filtermist and the company employs a team of highly skilled welding technicians tasked with ensuring each unit meets internationally recognised quality standards.

Each Filtermist body and perforated internal drum is made from sheet metal which is rolled into a cylinder and then welded at the seam, whilst collecting veins and external drainage channels that return clean oil back to the machine tool are also welded onto the unit.

The extraction system installed at Filtermist's new facility consists of two Absolent A dust 5 units designed to handle 17,600 m³ air flow per hour. It draws welding fumes and smoke from 16 pickup points through 14 extraction arms, connected by 260 m of ducting. Each point is fitted with an F Monitor from Filtermist which allows engineers to see at a glance that the extraction is working properly. F Monitor uses a traffic light warning system to alert the operator to any reductions in air flow which could be caused by blockages.

Filtermist is the sole UK distributor for Absolent and, as such, its engineers are accredited by the Swedish company to survey, recommend, install, commission, and service Absolent extraction equipment throughout the UK.

James Stansfield continues, "Many of the UK's leading manufacturers rely on Absolent equipment to ensure the air in their manufacturing facilities is clean and safe. Our team is highly experienced in specifying Absolent extraction systems, but it was interesting to act as the client as well as the supplier for this particular project; if anyone was likely to be a tricky customer it was Filtermist as clean air is our business.

"We've been manufacturing Filtermist units at our new premises since August and all of our workforce, without exception, have commented on the huge difference the new building has made. The extraction system is a key part of the new building and we are really proud of what we've achieved."

As well as manufacturing oil mist collectors, Filtermist also offers a number of services including on-site surveys, air monitoring and LEV testing for all makes of LEV equipment. The Absolent units installed at Filtermist's new HQ will be regularly serviced and tested by Filtermist engineers to ensure the company adheres to COSHH regulations and HSE guidelines.

Find out more about Absolent in the UK by visiting **www.absolent.co.uk** or contact Filtermist's sales team on 01952 290500 to discuss your industrial extraction requirements.

Formed in Bridgnorth, Shropshire in 1969, Filtermist International manufactures and markets Oil Mist, Fume and Dust extraction equipment for all types of manufacturing and engineering processes. With over 200,000 units in daily operation in over 60 countries, the company won a Queen's Award for Export Achievement in 1990 and continues to expand its export operations as well as its UK client base.

Filtermist International Ltd
Tel: 01952 290500
Email: sales@filtermist.com
www.filtermist.com

Updated hire equipment cleaning cabinet

Dustcontrol UK, headquartered in Milton Keynes, has developed a series of mobile dust extractors and air cleaners specifically designed to separate fine and hazardous dusts, such as silica dust.

The second-generation DC Box is a purpose built cabinet that helps hire companies combat and contain harmful dusts when cleaning returned tools and equipment.

Dustcontrol equipment uses HEPA H13 filters, unlike most other products, which only use M class filters. The use of H13 filters guarantees that the products remove 99.97 percent of all particles greater than 0.3 micrometres from the air that passes through the equipment; meaning air exhausted from the products is the cleanest it can be.

The DC Box acts like a fume cupboard, containing dust from equipment that's cleaned inside it and then filtering the air. Cleaning can be done with the integral air gun and vacuum suction hose, improving the lifespan of hire equipment and ensuring that any hazardous dusts are removed before further hire.

James Miller, Dustcontrol UK's general manager, comments: "There's a huge requirement for this amongst hire companies at present, something we have recognised and responded to.

"Equipment is placed into the box via a door and sliding tray. Three hand hole openings on the front allow the operators to handle the equipment inside during the cleaning process, whilst a third functions as an air inlet."

The cabinet is also equipped with a light that allows users to clearly see if equipment is clean and the tray has a rotating mesh top for ease of access and use. Large particles and other waste drops into a plastic bag at the base of the DC Box, helping with the efficiency of the clean. An AirCube 500 is integrated into the system, which means its HEPA H13 extraction capabilities constantly clean the air inside and remove smaller airborne dust particles that can be generated during the cleaning process.

James Miller continues: "With hire companies, equipment is often returned dirty, which can generate large amounts of dust within hire depots. The DC Box

efficiently contains and extracts this dust, helping to improve the lifespan of the hire equipment whilst also stopping the spread of airborne dust within the depot.

"It makes the whole process of cleaning the equipment much safer to undertake by reducing the potential hazards that handling such equipment can present and helps hire companies meet workplace exposure limits for dust."

Dustcontrol UK
Tel: 01327 858001
Email: sales@dustcontrol.co.uk
www.dustcontrol.co.uk

Nederman introduces most flexible dust collector ever

To ensure a perfect fit into virtually any manufacturing application that generates dust, smoke or fumes, Nederman has now introduced the new L-series modular and fully configurable dust collectors.

In manufacturing facilities where dust, smoke or fume is generated during the production process, the primary objectives are to create a safe working environment for the workforce, whilst achieving low emissions to atmosphere to meet increasingly stringent environmental and health and safety regulations. Since no two facilities are the same, Nederman has designed its new L-series dust collectors to be fully flexible and configurable to match a wide range of needs in the collection and recycling of dust, smoke and fumes.

The core of any dust collector is the filter media. The Nederman L-series dust collector offers a wide portfolio of filter media in bag or cartridge format, which ensures that performance and filter life is optimised, whatever the contaminant. After selection of the correct filter media, the dust collector is configured to match the required airflow and application characteristics. The L series is modular and assembled from a limited set of stocked panels. This panel stocking enables Nederman to offer very low lead times for all the range, with some standard pre-configured filters available in just two working weeks!

Nederman's wide expertise in extraction as well as collection of dust, smoke and fumes helps ensure not only a perfect fit, but also efficiency and a future-proof solution.

The new L-series can be expanded to adapt to future process changes or new regulations. New filter modules can easily be added whenever increased filter capacity is required.

Low total cost of ownership

The L-series offers low total cost of ownership due to low power consumption, minimum maintenance needs and extended filter lifetime. It can be supplied either pre-assembled or be fully built on-site, for those occasions where access requirements prohibit the installation of an assembled filter. This may also generate considerable savings on shipment costs. The Nederman L-series is available in ATEX compliant configurations for safe handling of combustible dusts, as well as with a variety of ancillary components and equipment for configuring the dust collector and system to match all of your facilities operation and maintenance needs. These options include pyramid or trough type hoppers, a no-hopper venting version, dust discharge valves, dust storage bins with 50 or 100L capacity, integral or floor mounted fans and fan silencers.

A wide range of applications

The portfolio of filter media options and configurations available makes the L-series suitable for a wide variety of applications, including crusher extraction, spray dryers, foundries, mixers, grinders, kilns, welding, plasma cutting, shot blasting, thermal spraying, biomass, mining, metallurgical, food and pharmaceutical processes. Nederman has built the L Series to be suitable for rigorous environments and applications. It is robust, resilient and weatherproof, and whilst the modular method of construction makes the air flow capacity virtually unlimited, there are standard sizes which cater for flows of approximately 5,000 to 300,000m^3/hr, dependent on the application and the media selected.

The Nederman Group is a world leading supplier and developer of products and solutions within the environmental technology sector. As a global leader in industrial air filtration and resource management, it is committed to playing a vital role for sustainable and efficient industrial production.

All Nederman's solutions combine care for the environment and for employee health by improving work efficiency and production economy, making its products both ecologically efficient and economically efficient. The company vision is to combine these two concepts under a common name: eco-efficiency.

For more details on how Nederman can clean up your work environment, please contact your local representative.

Nederman Ltd
Tel: 08452 743434
Email: info@nederman.co.uk
www.nederman.co.uk

Extraction problem solved for automotive application

Climavent have completed the installation of nine magnesium sanding and deburring benches for their customer in the automotive industry.

Manufacturing large die cast components and assemblies such as instrument panels and dashboards they required a solution to control the highly flammable magnesium dust.

In order to comply with current health and safety guideline HSG 258, Climavent supplied 2.4 m wide x 1.2 m deep work benches with strip curtain sides and top canopies to form an enclosure around the workpiece. The sides and top canopies not only control the airborne respirable dust but also contain heavier swarf and so keep the whole workshop cleaner and safer. A turntable was provided to allow the operator to work from one side of the bench.

LW22 stainless steel wet collector units with magnesium controls provides an airflow of 8000m³/hr for each bench. Wet collector units draw the dust-laden air through a tank of water. Heavy dust particles are thrown directly into the water and settle as sludge in the base of the unit for subsequent removal. Air and light dust are drawn over the surface of the water and scrubbing cups turn the air and entrained water, wetting even the very fine dust particles. A series of baffles removes the wetted dust and clean air is discharged from the top of the unit back into the works atmosphere. Smooth walled ductwork was used to connect the benches to the wet collectors.

Down draught benches are a 'must have' for any manufacturing environment that conducts applications including; heavy duty grinding, fettling, deburring or linishing. They are available in standard widths of 1.2, 1.5, 1.8, 2.4 and 3.6 m and are supplied with full height sides and canopy tops with integral lighting. LW22 wet collectors are manufactured in GRP as standard but are also available in stainless steel. The units have no main filters ensuring that the original high suction rate is maintained throughout the life of the unit. Depending on the type of dust generated wet or dry filtration systems are available.

With over 25 years' experience, Climavent Systems are a leading company in the design, supply and installation of dust & fume extraction systems for all industries.

Climavent Systems Ltd
Tel: 01942 726164
Email: info@climavent.co.uk
www.climavent.co.uk

Dust collector features cleanable filter system and explosion protection

The new Quad Pulse Package PX dust collector from Camfil Air Pollution Control (APC) offers high performance in a compact unit designed for pharmaceutical, chemical and other processes that produce hazardous dusts in high concentrations.

The collector has a cleanable filter system that facilitates continuous manufacturing processes and eliminates frequent costly filter replacements. Measuring 124.46 cm wide x 106.68 cm deep x 220.98 cm high, the space-saving unit can be conveniently positioned on the production floor; and constructed to provide the highest explosion protection in accordance with ATEX standards, it can be located indoors with no need for additional explosion safety devices.

Thanks to a segmented cleaning process performed during operation, the Quad Pulse Package requires just a single primary filter cartridge. The high efficiency primary pleated filter comes in a conductive (anti-static) nano fibre or PTFE media and offers exceptional dust release for extended life, energy savings and reduced change-out schedules. It also prolongs the service life of the second-stage filter, a HEPA H14 filter that provides 99.995 percent efficiency to capture the finest, most harmful dust particles.

Using materials from the aerospace industry, the HEPA filter functions as a tested flame and contamination barrier. In addition, the pressure-resistant housing maintains integrity with no damage during an explosion event.

For hazardous dusts requiring full containment to protect workers and prevent cross-contamination, a user-friendly bag-in/bag-out (BIBO) containment system is available to ensure safe-change at all stages: primary filter, HEPA filter, and dust discharge.

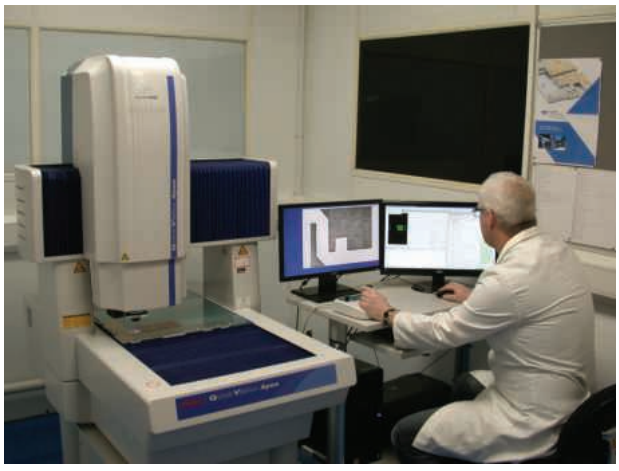
An integrated fan provides the required suction and is insulated within the unit for quiet operation.

Indoor installation capability significantly reduces install costs and time by simplifying the ducting requirements and also allows easy access for all maintenance functions.

Pharmaceutical applications for the Quad Pulse Package PX collector include tableting, mixing, blending, granulation, drying, coating, filling and packaging. It is designed for new project installations as well as projects involving the replacement of inefficient, non-ATEX or non-containment compliant dust collectors or vacuum units.

Camfil APC
Tel: 01706 363820
Email: Europe.apc@camfil.com
www.camfilapc.com/europe

Mitutoyo provides TLT with a 'vision for the future'



Teledyne Labtech Ltd is one of the world's leading manufacturers of RF & microwave circuit solutions. The company's high-quality microwave circuits can be found in many demanding applications including defence electronics, air traffic control systems, global telecommunications and satellite communications systems.

Based in Presteigne, Mid-Wales Teledyne Labtech's impressive, hi-tech manufacturing centre boasts one of the most comprehensively equipped, printed circuit board (PCB) fabrication shops in Europe. In addition to other specialised plant, the company operates 16 vertical machining centres. The flexible machines have been modified to allow the precise drilling, cutting and routing of, not only standard PCBs, but also Metalbacked PCBs.

Teledyne Labtech has gained considerable technical knowledge and extensive manufacturing experience in the production of complex microwave PCBs, from double-sided PTFE, mixed dielectric multilayer PCBs, through to complex metal-cored PCBs. The company also offers plated through holes (PTH), blind and buried vias, laser cut cavities, embedded resistors and connectors.

The sheer complexity and exacting dimensional tolerances of these intricate circuits, together with the inherent material instability of the PTFE laminates in particular, necessitates the use of thorough in-process quality checks throughout each stage of manufacture. On completion, each of the company's PCBs undergoes meticulous, high-precision final inspection. As rising production levels and ever tighter customer demanded tolerances recently began to place a strain on the company's existing inspection equipment, a search was made for a fast throughput, high-accuracy, non-contact measuring system that would remove the possibility of inspection bottlenecks.

Dick Heinrich, site director, Teledyne Labtech explains: "Teledyne Labtech's Presteigne facility is dedicated to excellence in microwave circuit board manufacturing, assembly and testing. Our goal is to reliably produce specification compliant products for our customers by designing and building quality into all aspects of our business. Also, we are steadfast in our commitment to meeting customer time-to-market and time-to-volume requirements.

"We strive to achieve our objectives with the help of our ISO9001 accredited integrated quality management system, that embraces advanced quality planning and continuous process monitoring.

"As rising global demand for our microwave circuit solutions had started to place a strain on our final inspection department, it became clear that we needed to source a highly accurate, non-contact measuring technology that could keep pace with our increased output.

"Given the technical developments in the field of non-contact metrology, we compiled a list of system requirements that would not only solve our inspection capacity problem, but also further enhance our capability. Having approached our existing vision measuring systems supplier with a challenging system specification, the company was unable to meet our demanding requirements.

"After briefly considering a couple of alternative systems that were able to satisfy most of our needs, we concluded that the advanced Quick Vision non-contact system from Mitutoyo ticked all of our boxes and also provided a range of additional, extremely useful features that we had not specified. To confirm the machine's suitability, armed with several of our more complex PCBs, we conducted a thorough trial of its capabilities at Mitutoyo's Coventry Technical Centre.

"Not only were we very impressed with the ease and speed of generating programs related to the PCBs that we had brought along, the speed of the resulting inspection routines that took place in fully-automatic CNC modes and the precision of the machine's results, convinced us that we had found the ideal answer to our needs.

"Given the Quick Vision Apex Pro's speed of measurement and accuracy specification, we regard it as a 'future-proof' investment, in that it is capable of handling our anticipated inspection volumes and precision requirement for the foreseeable future

Mitutoyo's Quick Vision Series is an advanced non-contact dimension measurement system that uses a CCD (charge-coupled device) camera to take images that are magnified by a high-quality optical lens. The edges of the workpiece under inspection are then detected by the use of advanced image processing technology. Structural deformation caused by movement along each axis is minimised, ensuring that the innovative Quick Vision machines can be used to perform highly accurate measurements with minimal spatial coordinate distortions.

With sophisticated edge detection capabilities, an illumination wizard and advanced, user-friendly software the Quick Vision machines satisfy the demands of high accuracy, ease-of-use and outstanding performance.

The Quick Vision Apex Pro variant, as purchased by Teledyne Labtech Ltd, is a high-quality 3D CNC vision measuring system that provides superb accuracy and high levels of functionality. To enable optimum rigidity, the Quick Vision Apex Pro is based on a fixed bridge, moving table design. Programmable ring lighting offers excellent adaptability in lighting direction, angle and intensity, whatever the angle of the workpiece surface.

Mitutoyo UK
Tel: 01264 353123
Email: philip.fisher@mitutoyo.co.uk
www.mitutoyo.co.uk

Accurate, high-speed measurement with new laser scanner

FARO Technologies Inc, a world leading source of 3D measurement and realisation technology, announces the release of the new FARO Focus3D X 30 laser scanner. With a scanning range of up to 30 metres, the Focus3D X 30 is ideal for a variety of short-range scanning applications such as architectural preservation, as-built documentation, building information modelling (BIM), engineering, facility management and forensics.

The ultra-portable Focus3D X 30 enables fast, straightforward and accurate measurements of interiors, such as small architectural façades, complex structures, crime scenes, mechanical rooms, and production and supply facilities. Combining high-precision scanning technology with true mobility and ease-of-use, the Focus3D X 30 offers reliability, flexibility, and real-time views of recorded data. As with the entire range of laser scanners from FARO, the Focus3D X 30 features a Class 1 "eye-safe" laser.

"Usability and high return on investment are at the core of FARO's Focus3D X 30 product," notes Joe Arezone, senior vice president and managing director of FARO Europe and Asia Pacific. "With its feature set and price point tailored to short-range scanning projects, it is a powerful and effective tool for customers working in challenging economic environments."

With the introduction of the Focus3D X 30, FARO offers its customers a choice between the short-range Focus3D X 30 (30 metres), the mid-range Focus3D X 130 (130 metres) or the long-range Focus3D X 330 (330 metres) laser scanner.

FARO is the world's most trusted source for 3D measurement technology. The Company develops and markets computer-aided measurement and imaging devices and software. Technology from FARO permits high-precision 3D measurement, imaging and comparison of parts and complex structures within production and quality assurance processes. The devices are used for inspecting components and assemblies, rapid prototyping, documenting large volume spaces or structures in 3D, surveying and

construction, as well as for investigation and reconstruction of accident sites or crime scenes.

FARO Technologies UK Ltd
Tel: 024 76 217690
Email: uk@faroeurope.com
www.faro.com

Innovative measuring systems for precision instruments

When manufacturing very small parts, even a very minor temperature-related fluctuation in the machining centres can mean rejection. This is why Günter Stoffel Medizintechnik GmbH has turned to production metrology from Blum-Novotest for temperature compensation as well as other measuring tasks.

The company has turned to Blum because the smallest workpieces produced are less than one millimetre wide and extremely precise. A microscope mounted on the vice, nothing is a more appropriate symbol of the manufacturing method at Stoffel GmbH which specialises in the development and manufacture of high-quality surgical and endoscopic instruments.

The requirements are extreme, the spoons for the smallest biopsy forceps are 0.8 mm wide, the blade width on the edge of the spoon is just 0.01 mm and the two blades must meet precisely when closed. There are many work stages to be carried out by hand, such as deburring, polishing and adjusting for perfect function or riveting of the forceps joint.

In order to reduce manual work to a minimum, it has become of immense importance for the company from the city Tuttlingen, Germany, to produce as high-precision parts as possible using the CNC machines. "During assembling, every one hundredth of a millimetre becomes noticeable," explains managing director Dieter Stoffel.

Chip removal is carried out at Stoffel in a basement without air conditioning. The machines working there have computational temperature compensation, which calculates the compensation values using data such as travel distance, spindle speed and usage duration. In a normal manufacturing operation, that would function reliably, however, with frequent tool changes, internal compensation reaches its limits.

The problem was discussed during a joint visit by Blum sales representative Erhard Strobel and the responsible 'W&R' machine tool dealer. The solution was the Z-Pico touch probe, which facilitates the very precise measurement of the length of the tools and the corresponding compensation of the axes.

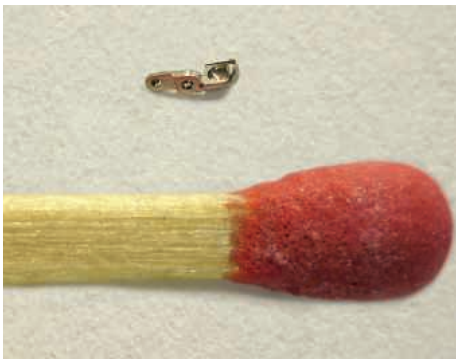
Inside the probe is a high-precision linear guide which ensures there are absolutely no lateral forces, thereby enabling the measurement of very small, sensitive or long tools. "Tools with a diameter of 0.05 mm or more can be registered," stresses Erhard Strobel. "In addition, the switch signal is generated opto-electronically by shading a miniature light barrier inside the device''

The two measurements for temperature compensation are only configured in the NC program after the rough machining operations, because these do not require a high degree of accuracy.

The finishing tools are measured directly before machining, at which point the temperature behaviour of the tool holder is also considered. As each part is measured using the Z-Pico and the correction factor is continuously adjusted, all temperature fluctuations throughout the day are reliably intercepted. The measuring process requires only a few seconds, because the tools are positioned for measurement shortly before the longest possible tool dimension with a rapid feed rate.

In one of the machining centres, in which predominantly round-handled instruments are manufactured, a Blum LaserControl Micro Compact NT laser measuring system is used instead of the Z-Pico. When machining the round handles, the precision of the Y axis is of particular importance. This meant it was necessary to measure not only in the Z direction but also in the Y direction.

Since Stoffel has been using the Blum laser, an increase in length is no longer an issue, the system corrects both the misalignment of the tool as well as the axis and the table itself. "Some NC operators mill a circular pocket in the surface of the machine table and touch this with a probe, but I think that is too uncertain," explains



Dieter Stoffel. "We have such small chips that one could become trapped in the pocket, thereby distorting the measurement. The laser measuring system is fitted with a special blowing system that cleans the reference tool prior to measurement, so it is always correct."

The production metrology from Blum has completely proven itself in Wurmlingen. Whilst previously it was necessary to allow the machine to warm up for 20 minutes, and despite this, a few bad parts were still produced before the desired precision was achieved. The medical devices produced by Stoffel GmbH have also become more accurate thanks to the Blum measuring systems.

Blum Novotest Ltd
Tel: 01283 569691
Email: david@blum-novotest.co.uk
www.blum-novotest.com

XL-80 laser functionality extended to perform diagonal tests

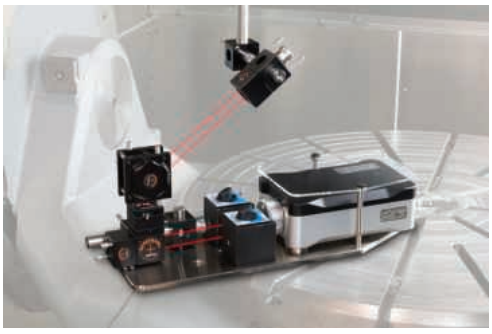
At EMO 2015, Renishaw introduced a linear diagonal measurement kit. Laser diagonal tests can be used to measure diagonal positioning and reversal errors in accordance with B5.54 and ISO 230-6 standards. The ISO 230-6 standard states that diagonal displacement tests allow the estimation of the volumetric performance of a machine tool. The new kit is quick and easy to setup, is easy to align and allows fast data analysis to international standards.

The Renishaw linear diagonal measurement kit provides everything needed to perform laser diagonal tests with an XL-80 laser interferometer system. The kit is designed for quick and easy setup, with purpose-built fixturing that's magnetically mounted to the machine tool bed and holds the XL-80 and optical accessories. A beam steerer and swivel mirror (attached to the plate) then provide a very controllable way to align the laser beam with the machine diagonals.

A key advantage of using the new kit to mount the XL-80 and optical accessories on the machine bed is that after measuring one machine diagonal, the plate can be moved to the other body and face diagonals with easy realignment.

As well as the hardware system, Renishaw also provides software to easily carry out laser diagonal tests. XCal-View provides convenient data analysis for laser diagonal tests, in accordance with ISO 230-6 and B5.54 standards. The application can take the data from laser diagonal tests and provide a report that shows the key errors and gives a graphical display of the results.

Renishaw is one of the world's leading engineering and scientific technology companies, with expertise in precision measurement and healthcare. The company supplies products and services used in applications as diverse as jet engine and wind turbine manufacture, through to dentistry and brain surgery. It is also a leader in the field of additive manufacturing (also referred to as metal 3D printing), where it is the only UK business that designs and makes industrial machines which 'print' parts from metal powder.



The Renishaw Group currently has more than 70 offices in 33 countries, with around 4,000 employees worldwide. Around 2,600 people are employed within the UK where the company carries out the majority of its research and development and its manufacturing.

Renishaw
Tel: 01453 524524
Email: uk@renishaw.com
www.renishaw.com

Innovative KENOVA set line V366

Kelch GmbH, based in Weinstadt near Stuttgart, showcased innovations for its KENOVA set line V366 line of modular tool presetters at EMO 2015 in Milan. The existing V345 and V466 systems have been combined to produce the new V3. With a measuring length of 600 mm in diameter (X), this unit is capable of measuring most tools.

Users can also select from 400, 500 and 600 mm towers. The SK-50 base spindle features a mechanical brake, mechanical 90 degree indexing for turning tools and also vacuum clamping of the tool tapers. Various interchangeable adapters are also available for HSK, Capto and VDI.

The base bodies and towers have a torsion-resistant and thermally optimised design. The user-friendly software intuitively guides operators to the correct result, even if they have to measure entire setup plans rather than only individual tools.

The standard design of the unit features proven CoVis software that runs on a 15" panel PC with touch screen operation. There is therefore no need for another separate PC, thereby saving space and delivering a compact design. CoVis software not only works with all popular measuring functions, but also transmits the measured data directly by post-processor to the processing machine. This prevents any input errors by operators and improves process reliability within the company.

Additional features, including tool identification systems and connection to tool management systems, are optionally available. Software extensions are also possible, including contour evaluation software and 3D generators for the creating of 3D tool models for collision observation. The unit has to be equipped with EASY software to work with these options.

Kelch GmbH, based in Weinstadt near Stuttgart, offers peripherals and services for manufacturers and users of machine tools for cutting processes. With over 100 employees, the company generates annual revenue of approx. €13 million. Kelch GmbH acts as the technology centre for the international business group in Europe. Kelch develops, manufactures and markets tool holders, cleaning devices, shrinking devices, presetters, as well as measuring machines, and also offers tool management services.

Kelch GmbH
Tel: 00 49 7151 205220
Email: info@kelchgmbh.de
www. kelch.de

VISI Flow is vital for Formaplex mould tool integrity

Specialist plastic flow analysis software performs a significant role for a leading UK tool and mouldings manufacturer which successfully produces over 400 pre-proven tools each year, and its costs were recovered within the first month.

Formaplex designs and manufactures aluminium and steel injection mould tools to the automotive, motorsport and aerospace industries, and produces low volume finished moulded components such as brackets and fixings, through to bumper assemblies and instrument panels. It also supplies composite tooling and components, carries out specialist machining and finishing projects, component painting, flocking and assembly.

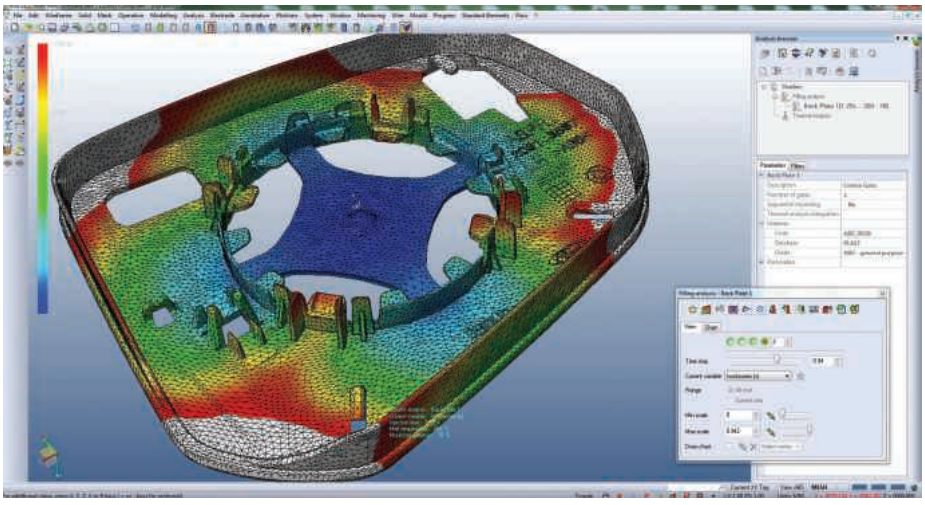
The company has over 40 CNC machines, both 3- and 5-axis, with a range of machining envelopes up to 8 m x 6.2 m x 2 m to suit a wide variety of design projects, along with 11 injection mould presses from 55 tonnes to 3,500 tonnes.

It specialises in providing full design support and advice for tools, including plastic flow analysis, logistics project management through production, measurement, tool testing, design, and manufacture.

Technical Director Adrian Chapman says that VISI Flow from Vero Software is vital in ensuring the long-lasting integrity of its mould tools. Injection simulation achieves cost-effective and reliable designs as well as optimum moulding conditions such as well-balanced runners with symmetrical filling patterns:

"Aluminium moulds, in particular, can be damaged if filled from the wrong position, in the wrong sequence, or by excessive pressure with inadequate clamp tonnage. It's all too easy to blow the mould and damage the parting faces, but VISI Flow shows us all potential manufacturing issues such as welding lines, air traps and the best gate location, before the mould is trialled.

"We can quickly analyse where the pressure is going to be too high, whether the material will freeze too quickly, if we need to have more than one gate and whether they're in the right place. Once we've analysed and understood exactly what we need to do, we can advise the customer on any necessary changes such as part thickness modification, changing the material or re-engineering."



Initial studies of moulded features and draft check analysis tell him all he needs to know to complete his initial Design for Manufacturability (DFM) work. He then carries out initial fill studies where VISI provides the same level of control over injecting molten polymer into the mould cavity as is available on the moulding machine. The simulation provides the ability to forecast and visualise how a component will be filled by the plastic melt front, making it possible to identify any potential aesthetic issues. VISI Flow provides a number of analytical tools that allow the investigation of moulding variables such as pressure, temperature, shear stress, frozen skin, fibre orientation, clamping force and many others.

"With VISI, I can quickly analyse the customer CAD data to verify moulding feasibility by checking for draft conditions and undercut features; VISI Flow then shows the capability of successfully moulding the required plastic part.

"We use the part splitting tools to create parting faces, enabling us to quickly design the main core and cavity block. Once we have those finalised, we model the sliders, lifters and any other small components, whether they're automatic or manual, and incorporate them into the mould tool.

"With VISI we can simulate the mould kinematics and correct any issues before we start cutting expensive metal. It gives a very clear indication of all areas where problems could arise. We can give our customers full and accurate information regarding the development of their mould tools. Without it, our dynamic approach and customer service would definitely be hindered."

He says that once the mould tool is complete it undergoes a maturation procedure: a series of process trials that monitor and review the continuous improvement of the product until the component is ultimately accepted.

The company operates out of 150,000 sq ft across three 'state of the art' sites in Hampshire and is expanding with a further 120,000 sq ft purpose built facility in 2016.

Specialist engineering is a crucial division of the business which supports the Metrology department, where moulded components are accurately inspected and measured with the latest CMM technology. Formaplex designs and manufactures bespoke fixtures for the inspection process, under the guidance of specialist engineering manager Grant Keates.

VISI plays a key role in this process too, ensuring absolute accuracy and repeatable tolerances. He explains that they design the fixture by importing the native CAD model into VISI and creating the fixture around the critical points of the component:

"The CAD data can come from our customers in a range of formats, but VISI handles it all seamlessly, which is a great advantage for our speed and efficiency of design."

His next step is to send the finished CAD data of the fixture to the shop floor, where VISI Machining's dedicated high speed milling techniques and built-in smoothing algorithms create intelligent 3- and 5-axis toolpaths for the Doosan and Kondia CNC machines.

"We don't have any real challenges or issues with designing and manufacturing our jigs and fixtures, because VISI helps us achieve everything we need to.

He explains that the Specialist Engineering Division embraces new technology with a high level of investment year on year and is now incorporating sheet metal fabrication, encompassing welding of a range of steels through to exotic metals such as titanium.

Summing up the company's overall use of VISI, Adrian Chapman says: "It provides us with key information at the design stage and it supports the complete mould process, which ultimately ensures total end product satisfaction.

"A conservative estimate is that within the first month of using VISI Flow to analyse the correct filling pattern and maximise our process parameters, we saved the cost of the software by avoiding downtime, repairs, wasted toolmaking and setting time, and reduced material costs."

Part of the Vero Software Group, VISI is a leading CADCAM solution for the mould and die industry, providing productivity, reliability and flexibility.

Vero UK Ltd
Tel: 01189 756084
Email: info@vero.co.uk
www.formaplex.com
www.visicadcam.com

Quendy expands its portfolio with ModuleWorks 2-axis technology

Quendy is a software development company that offers specialised development and integration services for providers of CAD/CAM software. After successful integration projects using the ModuleWorks simulation and 3-axis technology, Quendy is extending its software integration portfolio to include the ModuleWorks 2-Axis component.

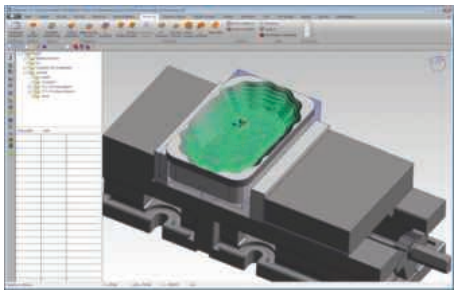
The ModuleWorks 2-axis technology is a software library that uses 2D geometries for the fast and accurate calculation of gouge-free milling and drilling toolpaths. The comprehensive and versatile library includes basic and advanced options for roughing, finishing, drilling and engraving and support for prevalent tool types and holders as well as tapered walls and 3+2-axis machining. Fast and easy integration into existing CAD/CAM software makes this component a powerful and cost-effective 2-Axis solution for CAD/CAM providers.

Quendy has already integrated the ModuleWorks 3-axis milling, 5-axis simultaneous milling and simulation technology into the vectorcam CAD/CAM system and is now in a position to add the 2-axis machining solution. Commenting on the integration work, Günter Böhning, CEO of vectorcam, says: "The ModuleWorks components provide state-of-the-art functionality and Quendy is able to integrate them quickly and easily into our software. For us, this means faster time to market and the ability to offer a cost-effective and highly professional CAD/CAM solution to our customers."

Quendy is a software development company based in the Netherlands with several years' experience in developing CAD/CAM software and specialized software solutions for CNC machining.

vectorcam GmbH, founded in 1993, develops and sells the highly successful CAD/CAM system vectorcam for drilling, milling, turning, wire EDM, lasers, etc. It is sold all over the world and is used by more than 20,000 companies in a diverse range of industries. Innovative solutions and outstanding customer service are key to their success.

ModuleWorks is a software component provider for the CAD/CAM 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. ModuleWorks 5-axis and simulation software has been used in the manufacture of complex parts for over a decade and they have many users in the global CAD/CAM industry.



Vectorcam user interface with integrated ModuleWorks functionality

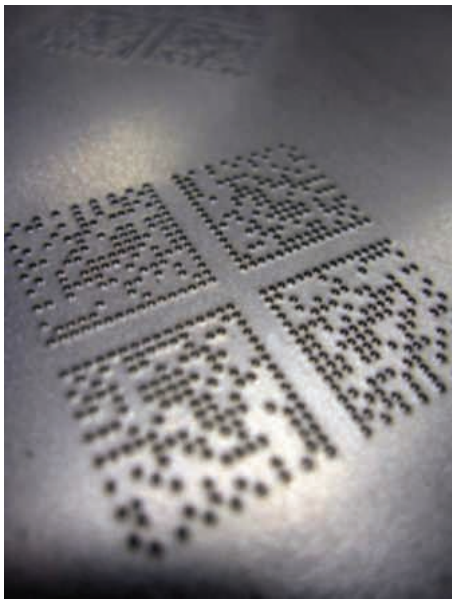
Moduleworks
Tel: 0049 241 4006020
www.moduleworks.com

Questions and considerations for part marking and component traceability

As one of the premier companies in the world with over a decade of experience and knowledge, Technifor, a division of the Gravotech Marking Group, has a background in component marking and traceability that was established in the automotive industry, and has developed to include aerospace and other leading technology industry sectors. These industries know that to improve traceability and enhanced methods of automatic code identification are needed with less human interaction.

Why is there a drive in industry to mark parts?

As a traceability solutions provider Technifor knows that the drive for parts marking and component traceability can come from a number of sources, such as a demand from a customer with a new product introduction, or the need to improve traceability for quality control, and even an internal business demand to improve manufacturing efficiency. One thing is certain in today's business environment, quality and cost can't be separated. The fact that companies are now producing parts for a lower cost does not negate the need for the highest quality. Manufacturing and service companies have to improve their traceability to match the increased quality levels. So, the focus should be component traceability not the marking of a code.



Where does part marking and traceability come from?

Everyone understands the 1D barcodes found on products in a shop or supermarket, which are scanned at the till and recognised by the system.

Offering a more advanced solution, 2D data matrix codes are read horizontally and vertically, which allows a lot more data to fit in a much smaller area. This technology was originally developed by NASA for the space shuttle to provide fast acting traceable codes to reduce the paperwork required.

What advantages can the use of 2D code offer?

Because of the way the data matrix code has been developed it does not require the sharp black and white contrast of a standard barcode. So, the code can be directly printed on to a part using laser or percussion marking technology, and the label, which can be peeled off or damaged, is no longer required and the part permanently marked for 'life'.

The algorithm used means there is an error correction redundancy in the code, so up to 20 percent of the data matrix can be lost, but it will still read correctly so the part can be traced after years of service.

With the data matrix scanned in to a production control system the manufacturer will be able to access the necessary assembly information and potentially save a lot of time. Knowing where and when the problem originated from ultimately reduces the cost and improves efficiency.

Once the code has been applied how is it read?

Although many companies offer 2D code marking equipment, it is both the generation and reading of the code that is vital. With a code it is about capturing an image, and there are many opportunities for things to go wrong. Time is always limited in a production environment, so it is important to make sure the image of the code is robust.

Readers come in two forms, hand-held and fixed readers. Selection depends on the application and the traceability solutions provider should suggest which type is best based on specific needs.

Can my components be marked?

Using laser or percussion marking equipment, most materials can be clearly marked. The actual matrix size will depend on the physical size of the component as well as the level of information required by the customer or end user. Most range between 5 by 5 mm up to 20 by 20 mm, and are generated by percussion or laser marking. As well as the 2D machine readable code these marking systems can also generate human readable characters as well.

Where and when in the production process should you mark?

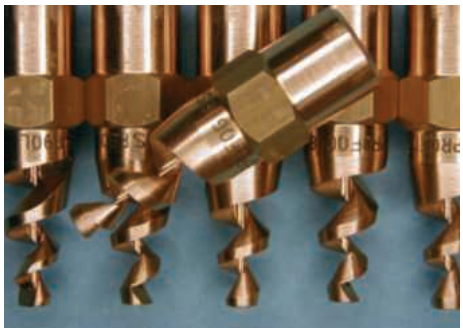
Previously the trend was to mark parts at the end of the line, but the more knowledgeable traceability solutions providers are promoting component marking as early or as close to birth as possible.

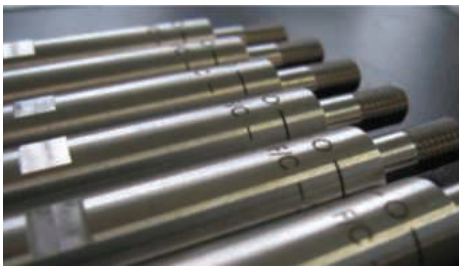
The potential benefits of having live component data tracking through the whole process are huge, and marking the part early provides this. It provides the ability to stop reject parts going through the process or,

even worse, being sent out to customers. And, mixed or incorrect parts can stop a production line, which can be very costly and is counterproductive for the supplier in terms of keeping a contract.

What should you look for from your solution provider?

If you have to invest in a traceability solution, find a supplier that is happy to show you how beneficial it can be. It is fair to say a complete traceability system will not win you any business, but it will stop you from losing it. It is not only beneficial from an engineer's point of view, as the business development team can approach customers and demonstrate the robust nature of the parts tracking offered, providing a guarantee of





product traceability and highlighting a willingness to invest in quality systems. In today's competitive environment manufacturers have to ensure they are always improving their cost-to-quality ratio; and full traceability supports this drive. It is vital to select a provider that offers a working partnership; one that will allow you full access and control of the system but will also provide a 'walk through' to guide you to the right solution. Technifor's solutions are based on honesty and its ability to guide customers to the best option, which is why the company has built such strong, long lasting and understanding relationships with customers.

What about post investment support?

Technifor prides itself on the work it does for customers at its facility in Leamington Spa. A total of six service engineers are available to provide support and the sales team are also technically trained. Understanding customers' needs, the company is aware that a high value production line can't wait for three days for someone to come out and fix the problem. Its philosophy has always been to support customers in a strained or high pressured environment, with bespoke customer care packages. As a company it offers traceability solutions, and its expertise means it can take full responsibility for the marking and reading of any data matrix.

Technifor
Tel: 01926 884422
Email: sales@technifor.com
www.technifor.com

Choosing the best marking technology for your metal marking application

With a variety of marking technologies suited to metal marking combined with a wide range of metal types, picking the optimum process for a marking application can be a challenge. A detailed understanding of the characteristics of each technology is key to ensuring the most favourable process is selected. Getting it right can deliver significant productivity benefits and reduce costs.

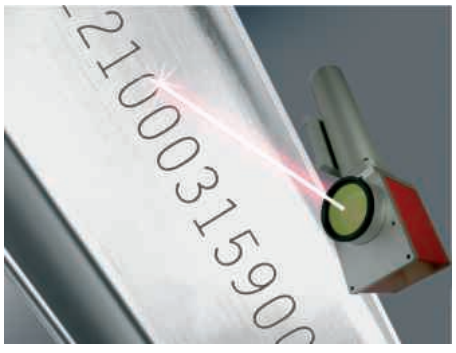
A marking standard for a particular industry may dictate the process and marking specification to be used on the component. This is commonplace in aerospace applications as well as some automotive, nuclear, oil & gas and medical applications. If the component does not need to be marked to a standard, some of the key considerations will include looking at the best process to suit the material, accessibility to the marking area, cycle time and batch sizes, the component function and how it may be affected by environmental considerations such as temperature, subsea conditions, effect on medical devices, stress factors, post marking treatments etc.

Product handling should also be considered: is it low volume and manually marked or production line environment and/or marking on the fly? A requirement for connectivity to ERP systems is also becoming more prevalent.

The three main technologies for direct part marking onto metals are laser marking, dot peen marking and electrochemical marking.

Laser marking is a non contact form of marking, making workholding simple and cost-effective. Extremely fast for large batch runs of the same item providing the data area is not too large, delivering high quality marks, is good for variable marking and has a large marking area. It is ideal for workstation and production line marking and is low maintenance. Lasers can mark onto most materials, although they can require different light sources. For example, fibre lasers are ideal for metal marking and some plastics but CO_2, green or UV lasers are normally better for plastics. Lasers are a significant capital investment compared with other forms of marking and whilst they are fast for many applications, they can be slow for large solid graphics. Extraction is also normally required.

Dot peen marking consists of using a solid carbide stylus to indent the component surface with a series of dots to make up the character. The machine has an integral controller and can receive data from keyboard, barcode scanner, PC or plc. The mark quality is good, low material stress, low on consumables and available in bench-top, hand-held and integrated models. The electromagnetic assembly stylus is quiet and can be used for serial no's, part no's, date/batch codes, logos, datamatrix codes including mark and read applications. They work well in harsh environments and marks can still be read after post marking treatments such as plating or painting. Dot Peen can mark up to 62HRc and the component requires fixturing.



Electro-chemical marking is a process that consists of passing a low electrical current through a stencil to permanently mark virtually any conductive metal. The process is economical and simple to use and delivers a very high quality high contrast mark. Most marks can be made in 0.5-4secs, regardless of the size of mark. Significant developments have been made to this technology, which now enables it to support high quality variable data marking such as sequential serial numbering, datamatrix applications meeting both latest aerospace standards and UMS's electrolyte is certified as safe for marking surgical components. It can mark thin wall section without distortion and is ideal for both low volume and higher volume batch runs. No fixturing is necessary. Equipment is compact enough to reside at the workstation and is fully portable.

UMS Ltd manufactures and supplies a wide range of marking technologies, including those mentioned above. The company's area of expertise is based on the ability it has to assess and understand your marking requirements fully, through its highly trained and experienced engineers. UMS will ensure you get the right solution at the right price, as well as offering a comprehensive after sales service.

Universal Marking Systems Ltd
Tel: 020 8755 5780
Email: sara.sawdy@ums.co.uk
www.ums.co.uk

Pryor pushes the boundaries of marking technology

World-leading component marking, identification and traceability specialist Pryor Marking Technology has unveiled a new technological breakthrough with help from the University of Sheffield Advanced Manufacturing Research Centre (AMRC) with Boeing.

Pryor has been pushing the boundaries of marking technology since it was founded in Sheffield almost 170 years ago and includes leading aerospace and performance car manufacturers among its clients. The company spotted a gap in the market when several customers asked if it was possible to mark components using the same CNC machine that made them, instead of having to transfer them to special marking stations.

"Moving parts around the shop floor is the biggest cause of scrappage and waste in many manufacturing environments," says Pryor's sales director, Alastair Morris.

"A tool that eliminated the need to move machined parts to a separate workstation would significantly reduce the risk of damage and free up workshop space, but there weren't any on the market."

Although Pryor is at the forefront of marking technology, its understanding of how CNC machine tools are controlled was limited, so it contacted the AMRC for help.

The AMRC invited Pryor's technical director David Ray, mechanical designer Richard Smith and Alastair Morris to its headquarters in Catcliffe, Rotherham, where Michael Garrett, a project engineer, with the AMRC's Integrated Manufacturing Group, provided the advice they needed.

"We're here to help companies large and small and are glad to see that result in innovations that will play a role in improving manufacturing processes and reducing waste," says Michael Garrett.

Alastair Morris explains what happened at the AMRC: "We looked at the different CNC systems, the connectors they use and the common issues they face with tools.

"We also discussed the problems you encounter if you try to mark a component with a standard CNC tool."

Armed with that information, Pryor developed a battery powered, wirelessly controlled dot peen marker that could be

stored alongside other tools in the CNC machine and selected when needed.

"Once we'd built a prototype, we took it back to the AMRC for testing in their new Mazak machining centre. The test was a success, demonstrating the manoeuvrability and marking ability of the prototype and how it could be controlled wirelessly, using a Bluetooth connection," says Alastair Morris. "We've now filed a patent application and are about to launch our new CNC Marking Tool on the global market."

Pryor Marking Technology Ltd
Tel: 0114 276 6044
Email: s.dixon@pryormarking.com
www.pryormarking.com

Increased recalls in the automotive industry

How vision-based laser marking ensures uncompromising traceability

2014 was a record year of recalls in the automotive industry which cost the carmakers dear, with almost 64 million vehicles having been recalled for safety problems solely in the USA and more than 1.9 million vehicles in Germany. This trend is observable in many other countries as well, and did not stop in 2015. A current example is a luxury carmaker that recalled almost 20,000 cars in China in August because of problems with the brake hoses. This is where innovative laser-based parts marking solutions come into play as they ensure more product safety and reliable traceability.

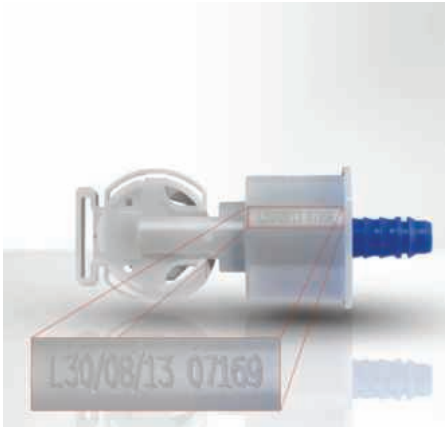
Product marking requirements in the automotive industry

The permanent marking of safety-relevant parts, such as the mentioned brake hoses, is extremely important in the automotive industry. It helps to meet the high standards of product safety, process reliability, traceability and quality assurance. In order to be resistant to external influences during manufacture and use, the markings on automotive parts have to be especially indelible and also resistant to temperature, light and lubricants. A high marking quality ensures optimum legibility and secure traceability. It is of further importance that the right markings are applied on the right position, to the correct and non-defective part. Such a marking process where all marks are executed precisely and with repeat accuracy ensures that waste is drastically reduced and productivity as well as efficiency are increased significantly. In times of increasing recall risks followed by increasing demands on the quality management combined with high cost pressure, this can be a crucial competitive factor.

Automotive part with traceable laser marked code

Unique laser-based process solution for more product safety and reliable traceability

Laser technology is ideally suited for the challenges of the product marking in the automotive industry. Innovative marking solutions even contribute to an easy, reliable traceability and with that to a higher product safety. With its closed-loop imaging marking process, FOBA offers an incomparable and unique solution at the market that includes the laser marking and that especially ensures process reliability before and after marking.



Roll over valve with laser marked traceability code

FOBA's solution is a reliable, highly precise laser marking system with the integrated patented vision system IMP (Intelligent Mark Positioning). IMP supports a reliable product marking by means of a pre- and post-mark optical validation as part of a three stage closed-loop marking process:

Prior to marking: part validation, pre-mark verification, automatic mark alignment

Laser marking

Post marking: mark-verification, Optical Character Verification (OCV), 2D code validation/code reading

Laser marking machines FOBA M2000 and M3000

The three stage marking process, combined with the patented vision system IMP ensures highest process reliability and zero defect markings and with that it makes a crucial contribution to the quality assurance. The code reading option is especially important for the basic documentation of product cycles and for the reliable and quick identification of products which is decisive in the case of product recalls. With FOBAs process solutions, carmakers and automotive suppliers benefit from a higher product quality, more efficiency and a reliable traceability.

FOBA Laser Marking + Engraving is among the leaders in manufacturing and supplying precision laser systems for marking and engraving. FOBA marking lasers mark a variety of materials and parts not least in the key markets of automotive and medical but also in electronics, plastics, safety and ID. FOBA laser machines for marking and engraving are especially applied in the fields of automotive part production and medical device marking as well as in tool, metal and mould making, plastics processing, jewelry and coinage. Worldwide sales and service branches service the most important markets.

In September 2009, FOBA became part of ALLTEC GmbH. Since then, FOBA is part of ALLTEC as a sales channel for laser part marking and engraving.

ALLTEC GmbH
Tel: 0049 38823 55393
Email: aweich@foba.de
www.foba.de
www.fobalaser.com

MARKATOR highlights its new product launch

The new battery-operated, handheld marking unit FlyMarker® mini was showcased at EMO, Blechexpo and FABTECH this year
The new battery-operated marking system is relevant for any sector producing large or small metal parts, i.e. metal sheet, plasma cutting, laser cutting etc.
It can also be used as an emergency or as a backup system if a production line fails. FlyMarker mini is the fourth generation of the system since 2004. The unit can be operated two-handed and the keyboard is user-friendly. It uses the well-known MARKATOR® software and can also integrate items such as barcode scanners and other functionality for counting etc. into the system.

The new FlyMarker mini builds on the strengths of previous models and offers a lightweight (2.7kg) and compact design as well as an introductory price of 3,990.00 Euros plus VAT. The marking unit features rapid marking times, self-explanatory and intuitively operated software and a dirt-resistant keyboard which is very durable compared to a membrane keyboard. The housing is made of glass fibre reinforced plastic and is therefore more break-resistant than, for example, housings from die-cast aluminium.

As the numeric keys are directly integrated in the keyboard, numbers which are often used in industrial applications can be typed in directly without accessing a submenu of the software. This means an enormous time saving for the operator during operation. Characters and numbers as well as individual company logos, test symbols or Data Matrix Codes can be marked.

The FlyMarker mini's centre of gravity is also suitable for mobile use. Due to its ergonomic design, the device sits well in the hand and effortless operation is possible (also in vertical work positions). An additional handle is mounted on the front face of the marking system, allowing an ergonomic two-hand operation and easier, precise and secure positioning of the marking system on the work-piece to be marked. Slipping away during the marking process can be avoided. If there is less space between workpieces, the second handle at the front face of the system can be easily dismantled.

The marking unit can be carried through the works premises directly to the workpiece to be marked. A carrying case can also be used. The unit is supplied with two lithium-Ion batteries so that time-consuming marking tasks can be done without interruption. Two prisms on the positioning plate help to mark round work-pieces easily (radial and axial). Height differences of up to 5 mm can be compensated. Uneven workpieces can also be marked at a constant marking depth. For special applications, such as marking round workpieces on the face etc., several optional accessories are available.

The marking force of the solenoid, specially developed for mobile marking purposes, can be adjusted individually to the material and the required marking depth. Nearly all materials can be marked, from plastics, aluminium, stainless steel up to hardened steel. Subsequent processing such as sand blasting, coating etc. do not present problems in most cases, as the marking remains visible.

Via the practical preview function, it is possible to picture the marking file in the high resolution LC colour display before the marking process is started thus avoiding incorrect markings. The internal memory of the hand-held marking system offers space for several hundreds of marking files, fonts and logos which can be imported and exported using the USB-interfaces of the unit. These interfaces can also be used for optional available accessories such as a barcode scanner.

MARKATOR
Manfred Borries GmbH
Tel: 0049 7144 857516
Email: sales@markator.de
www.flymarker.com

Quicker marking with new software

The new VisionLine Mark image processing program from TRUMPF makes marking even simpler when using the lasers in the TruMark 3000, 5000 and 6000 Series. The software has two new functions that make marking with a TRUMPF laser even easier and, above all, faster: Autofocus and Traceability.

The Traceability function supports item identification and applies 2D markings to the part

New functions and an intuitive user interface

The Autofocus function automatically determines the right working distance for components with varying marking planes. The software determines the exact position on the surface of the part and, in response, the Zaxis automatically moves to the marking position. This eliminates the need for elaborate setup work and costly fixtures. Productivity rises at the same time and there are fewer rejects.

The Traceability function supports users in part identification and traceability. VisionLine Mark extracts information from a database, for example, converts that data into a 2D code such as the data matrix or QR code, and then marks the component. Immediately after the marking process, a camera reads out the code thus generated and applied to the part. Here the software can also make a comparison between the specified and actual situations. The Traceability function also ensures that the marked code is actually legible and that the contents concur with the input information.

Immediately after the marking process, a camera reads the code generated and marked on the component

The new user interface built into VisionLine Mark attaches great importance to intuitive and convenient operation. Thus, for example, the illumination and camera settings can readily be stored in the software. The camera is then calibrated under software control.

New marking workstation for medium lot sizes

The new TruMark Station 3000 extends the portfolio of marking workstations already available: the 1000, 5000 and 7000. It is especially advantageous for users who need to ensure traceability in small and medium-sized production runs and who wish to integrate the marking process into their own manufacturing.

Laser safety class 1 guarantees maximum protection for the user. The new workstation has a large interior space so that it can accept components up to 350 x 450 x 200 mm in size and weighing a maximum of twelve kilograms. If necessary, the transfer flaps installed at the sides of the case can be removed. This lets the user integrate the workstation into an assembly line or, alternatively, to employ it for marking even larger components.

A motorised Z-axis, which can be software-controlled, makes for convenient positioning of the components. In addition, the focal position of the laser can be adjusted perfectly to comply with requirements. As an option, the workstation is also available with an additional axis of rotation.

Regardless of whether the operator is seated or standing, the new TruMark Station 3000 is available in a compact desktop version or as a convenient stand-alone version with a base. Depending on requirements, all TRUMPF marking lasers from the TruMark Series 1000, 3000 and 5000 may be used. A suction unit is also available as an option.

New UV laser for marking plastic

TRUMPF has also introduced two new products, the TruMark 3330 and the new workstation TruMark Station 3000. TRUMPF is expanding its TruMark Series 3000 with the new TruMark 3330 ultraviolet laser. In addition to inscribing glass, ceramics and organic materials, the primary use for the diode-pumped solid-state laser is marking plastics.

The new TruMark 3330 is equipped with an efficient air cooling system, significantly reducing maintenance effort and in this way lowering the laser's operating costs. An additional benefit of the new marking laser is its low energy consumption, while getting more work out of that power.

The new TruMark 3330, thanks to its non-proprietary interface architecture and plug-and-produce connection, is flexible in its utilisation. It can be integrated into new or existing assembly lines without difficulty and can communicate with the components in the manufacturing system using standard interfaces such as ProfiBus, ProfiNet or EtherCAT.

Also new to the TruMark Series 3000 are the scanner optics integrated into the marking laser. They offer higher precision and greater dynamics and, in turn, higher laser productivity and enhanced marking quality.

TRUMPF Ltd
Tel: 0844 4820188
Email: sales@uk.trumpf.com
www.uk.trumpf.com

Minimo is the perfect solution for prestige gun engraver

Vince Crowley has been engraving sporting guns for twenty years and is one of only a handful of engravers with the requisite skills to work on the very best guns being crafted today.

He comments: "Although the skills I have are essentially traditional, to create work of the highest standard requires constant innovation and the development of new techniques, taking advantage of advances in technology."

Two devices that Vince finds particularly useful are the Minimo® ultrasonic and rotary handpieces that he has purchased from Engis UK:

"It is essential that each tool I use is adapted perfectly for very delicate cuts and sculpting. I find I am constantly using my Minimo tools, because, just like traditional tools, they work perfectly in the hand. They are also extremely reliable, so that hours spent concentrating at the workbench are never interrupted by the tools breaking down."

An exhibition-grade gun is always a one-off and its decoration can never be replicated, as each engraver's style is simply inimitable and is what sets the gun apart. The tools that are used to create this array of stunning game scenes and complex carved steel scrollwork are many and varied and can take months to achieve. One of Vince's current tasks is a "double rifle" that he will be working on for up to a year, and whose final price may well be in excess of £100k.

Vince Crowley engraving a prestige gun using a Minimo hand-piece

Vince Crowley explains: "When you are working at this level, carving with exquisite detail onto a very expensive rifle action, you have to work with tools that you really trust. I believe the Minimo ultrasonic and rotary hand-pieces are the best that money can buy and, used in conjunction with Engis' Hyprez® products, they help me to achieve the perfect finish that the most discerning clients in the world are looking for."

All Minimo handpieces are designed to provide the user with unsurpassed versatility, flexibility and ease-of-use, with standard, rotary handpieces providing quick-change head options and a wide range of speeds. The Polytor Ultrasonic handpiece is ideally suited for small and intricate work because its reciprocation is short and moves with ultrasonic speed, so the tool tip can be used for very fine detail tasks.

Engis (UK) Ltd
Tel: 01491 411117
Email: sales@engis.uk.com
www.engis.com

The mark of quality

Trotec is one of the world's foremost manufacturers of laser machines for engraving, cutting and marking. With over 380 employees spanning 13 international sales branches, it offers customers access to an international network of professionals and a wealth of experience in the laser industry.

As well as our state-of-the-art CO_2 and fibre laser machines, customers enjoy a comprehensive panorama of services, including consultations, materials tests and technical advice and support by our top qualified service technicians.

Trotec understands that the needs of our clients are constantly evolving as their business expands. That's why it offers a range of optional upgrades with all of its machines. Customers are free to pick and choose depending on their needs and Trotec can install any of your desired upgrades at any time.

As a recognised technological leader in the international market for laser cutting machines and laser engravers, Trotec sees it as its duty to continue developing and improving its laser technology. This dedication to innovation has led to the development of new technologies like the Speedy 300 flexx laser machine, the world's first laser system to combine CO_2 and fibrelaser technology in one machine.

The Speedy is the ideal laser engraving machine, no matter if you are starting out or want to speed up production. Highest quality components ensure minimal maintenance requirements. The patented InPack Technology™ provides the highest laser lifetime in the market. The Speedy is 100 percent designed and manufactured in Austria.

Trotec builds the fastest laser engravers in the market. Time is money and the minutes spent per laser job are crucial for your business. You can increase your production efficiency by processing at maximum speed of 3.55 m/sec and 5 g.

Speedy laser machines come with the JobControl laser software. It is easy to learn and a 15 min tutorial is sufficient to start laser engraving. With its many options, the software is suitable for beginners and professionals alike. As Speedy flexx laser machines are equipped with both a CO_2 and a fibre laser, you can mark and engrave even mixed materials in only one process without having to change the laser source, the lenses or the focus manually.

Trotec Laser UK
Tel: 0191 580 1184
Email: sales@troteclaser.co.uk
www.troteclaser.co.uk

Waterjet finds its groove in maker culture

One might describe software developer Autodesk's Workshop at Pier 9 as a traditional communal workspace. But in reality, it is a highly advanced maker space where artists, engineers, designers, architects and others network and share resources and knowledge that blur the lines between art and manufacturing. It is here that an OMAX® 60120 JetMachining® Center helps foster innovative designs and transform how things are made.

Up to 20 full-time artists, dubbed Autodesk Artists in Residence (AIR), work at the Workshop in five-month intervals seeking to push the boundaries of both Autodesk software and production-quality machine tools in efforts to master what is often thought impossible.

The Workshop, located on Pier 9 in San Francisco, houses individual shop areas for fabrication (welding and forming), woodworking, metalworking (CNC machining), electronics, laser cutting and 3D printing. It also has a commercial test kitchen, industrial sewing center and other specialty project areas. It boasts an impressive array of equipment: manual and CNC turning and milling machines, drill presses and routers, a multi-tasking (turning and milling) machine and a turning centre with live tooling in addition to the OMAX abrasive waterjet cutting machine.

The 60120 JetMachining Center has proven to be a valuable piece in the facility's gallery of manufacturing processes. It offers high accuracy of motion and easily accommodates components measuring up to 5 feet by 10 feet. The machine is equipped with OMAX's intuitive Intelli-MAX® Software Suite, its powerful, highly efficient direct-drive EnduroMAX® Pump technology and the company's A-Jet® multi-axis cutting head with a 0 to 60 degree range.

Artists must complete mandatory general workshop safety and appropriate training

for each machine or piece of equipment they intend to use. Training classes for the OMAX are in high demand and have been full every month.

Daniel Vidakovich, Workshop CNC shop lead, and Martin Horn, the lead workshop instructor who teaches the waterjet class, wrote a basic training manual for the waterjet. It is only nine pages, reflective, they say, of how short the learning curve is with the OMAX machine.

"The workflow of the OMAX is probably the simplest of CNC tools," comments Martin Horn. "In four hours, we can train a person to a level where they can construct a cutting path, validate that path, fixture the material and make a cut. Key to us being able to do so is the simple, straightforward OMAX software."

With the OMAX, workshop users cut mostly aluminum and sheet metal in thicknesses that range from 0.063" to 3", but they have pushed the limits with 2"-thick felt, glass, concrete, cardboard and even a few epoxy resin sculptures.

The machine lets them quickly produce multiple iterations of a CAD file and, to a certain degree, determine real-world manufacturability of their particular designs/projects. Examples of such instances and of the connection between software and hardware are a rocking chair made of wood and metal as well as a three-legged, all-aluminum stool.

Embedded within the rocking chair's wood components are thin aluminum spline

pieces cut on the OMAX that join the various components and provide strength. The chair represents a meshing of art and traditional craftsmanship achieved with waterjet cutting.

The stool showcases simple yet extremely innovative design elements as well as new manufacturing/assembly methods. Its creator used the OMAX to create the stool's special one-of-kind "oblique tenon" joints. The stool's components all self-align during assembly and their close-tolerance fit ups

would have been impossible to produce without the OMAX and its A-Jet multi-axis cutting head.

The ease-of-use and flexibility of the 60120 make it one of the most used machines in the metal shop. Rarely does the machine cut the same part twice. With many different artists working on many different projects, every job is a new and requires a different tool path. As these maker culture artists on Pier 9 continue to explore new designs and innovations, it's clear the OMAX 60120 will be instrumental in helping them bring their ideas to reality.

UK Contact:
Aquajet Machining Systems Ltd
Tel: 01244 409199
Email: peter.lucas@omax.com
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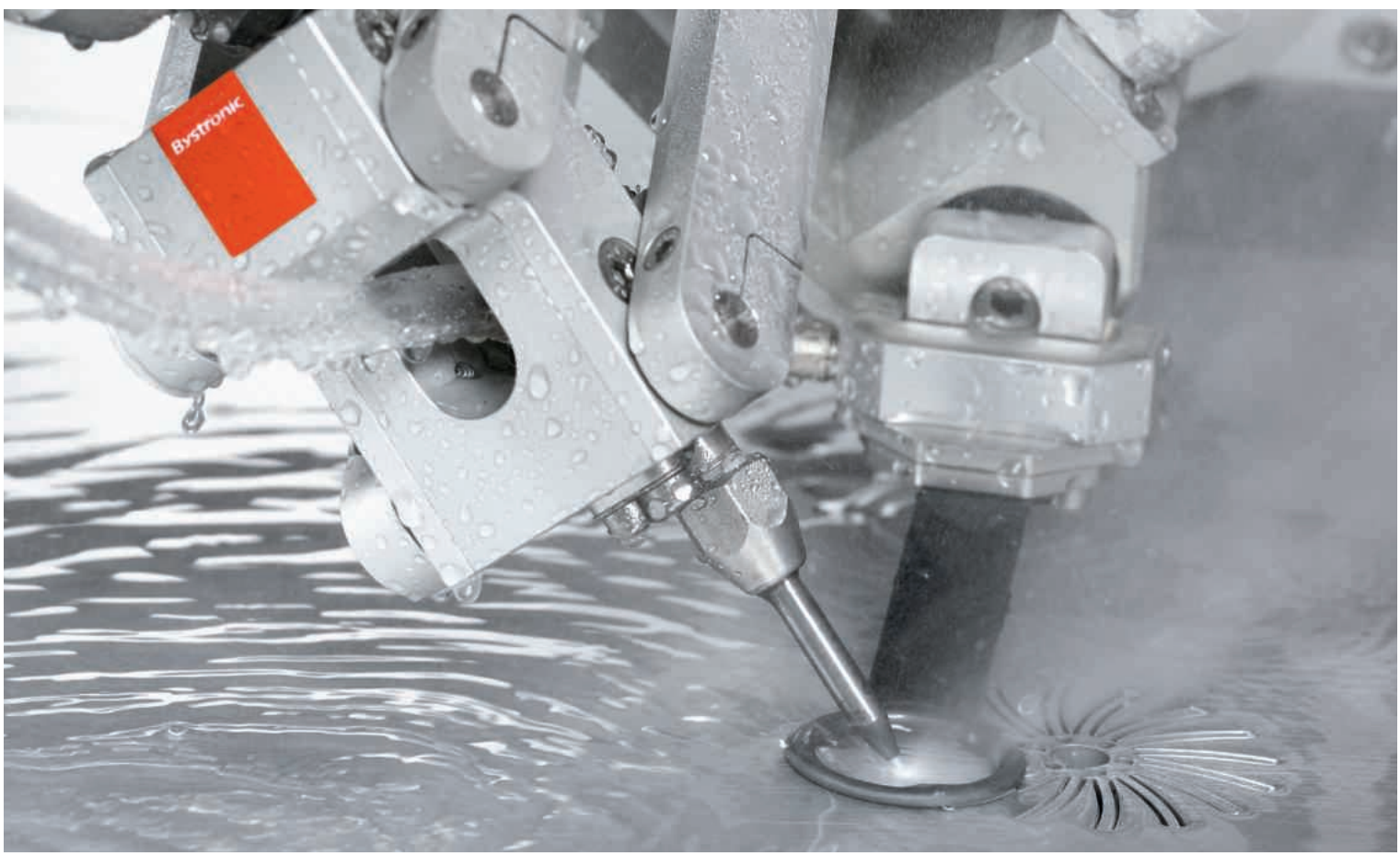

STM and Maximator JET show innovative spirit once again

With a live demonstration of its successful 3D cutting head "STM3D/68" and the brand new "OneClean system" for the recycling of pure and Abrasive water, the Austrian waterjet specialist and its German system partner Maximator JET presented sustainable solutions for efficient waterjet cutting at the recent Blechexpo show.

The subject of economic efficiency has been the signature feature of waterjet specialist STM and Maximator JET for more than 30 years. In light of the growing costs for energy and water, STM presented two in-house developments that will make cutting with water not only more accurate but also considerably more cost efficient.

The brand new "OneClean" system guarantees clearly lower costs for water and abrasive. This is ensured with the previously unique modular water treatment solution that not only removes sludge from of the cutting tank, cleans cutting water until it can be introduced into the conduit and that can recycle cutting water at 100 percent and abrasive at 50 percent in the final expansion stage.

With this innovation that can be retrofit at any time, STM ensures that new and existing customers can make their own production processes sustainably fit for the future and more economic. The STM3D/68 3D-cutting head has been very popular in the waterjet cutting field since its introduction. It allows parallel 2D and 3D cutting with and without abrasive at tilting angles of up to 68° and pressures of up to 6000 bar on the basis of one and the same software program. This reduces the operating costs for first-class 3D cuts to the level of customary 2D cuts.

Water naturally plays a big part in waterjet cutting. Cutting is general performed with drinking water. Users previously had to consider the following: On the one hand, material wear is minimal with ideal water quality – on the other hand, water consumption is increasingly regulated and costly.

For this reason, STM has now developed a system that recycles water automatically and as sustainably a never before: OneClean. This innovative modular system recycles water and abrasive as needed. It effectively controls the water cleaning, treatment, recirculation and abrasive recycling fully automatically right from the cutting tank. The last process makes 50 percent of the material reusable and thus contributes considerably to a minimisation of the largest variable cost factor of abrasive cutting. In addition, OneClean significantly increases the user comfort and maintainability of a waterjet cutting system.

Retrofitting is also no problem because OneClean can be integrated in all STM and Maximator JET systems without problems.

STM and Maximator JE offer more than customised water analyses to make the benefits transparent for individual interested parties. The savings potential through avoiding wastewater and reducing fresh cutting water consumption as well as through all other relevant operating cost parameters are also evaluated by the manufacturer without obligation. Interested parties can have customised sample cuts made under optimal conditions at the Eben testing center or the brand new waterjet cutting centre in Schweinfurt, Germany, in order to evaluate the effectiveness of the system for their specific needs. STM and Maximator JET will even provide rental machines for trial use, if required.

The "STM3D68" clearly slims down many production processes and interconnects them better. In the 3D field, the 3D cutting head enables pure water as well as abrasive cutting and combined parallel 2D and 3D cutting along with the integration of 6-axis robots with a uniform interface. The special feature of the design is achieved using a 2-axis swivel-joint that makes swivel movements in all directions and thus all 5-axis cutting tasks possible. "STM3D" rotates rapidly because of the Tool Center Point. Compensatory movements with angle changes are thus no longer needed and cuts with pure water are noticeably accelerated.

5-axis kinematics enable chamfer cuts and thus increased precision at the cutting edge. Cutting valves, focus, mixing chamber and water nozzles are all equally suited for 2D and 3D production. Besides, the cutting head can be services easily with standard replacement parts for 3D and 2D cutting.

STM Stein-Moser GmbH
Tel: 0043 6458 20014-0
Email: office@stm.at
www.stm.at

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Custom waterjet solutions for the UK market

by Alison Kulick

WARDJet designs more custom waterjet equipment than other manufacturers in the waterjet industry. In the last year alone, 40 percent of the systems that WARDJet manufactured have been tailored to suit the customer's application.

One such machine is the ZXL-1224, designed for an oil and gas customer with locations in Scotland and Texas. The ZXL-1224 is optimised for submerged cutting of heavy duty pipe material using a rotary axis and also features a flat section of the tank for traditional sheet cutting. Another example of a recently built custom machine is the EXL-1524, which was designed with an over/under shuttle table powered by a scissor lifting mechanism for a foam and rubber converting company. The EXL-1524 has three water-only cutting heads on a single spreader bar with automatic head spacing, which can work in sync to perform production runs, or be turned off to one or two heads for jobs with less volume.

To save on time and labour costs, the EXL-1524 operator can load material into the system on one shuttle table, and safely unload the finished parts on the second table while cutting is taking place.

One final system that is worth mentioning is a full automation system designed to cut roughly a thousand parts per hour at a production facility in China, the BL-0606. The BL-0606 features a magazine loading device that delivers parts to be cut by four synchronised cutting heads. The cut parts travel down a stainless steel chain conveyor to stations for washing, drying and finally stacking.

With 30 percent of employees holding an engineering degree of some sort, it is easy to see why WARDJet is the industry leader in custom waterjet manufacturing. WARDJet and authorised UK representative DSG Waterjet have recently teamed up to provide the European market premier waterjet equipment, from build-it-yourself waterjet kits to highly specialised custom automation systems.

WARDJet is a leading manufacturer of custom waterjet systems. Just as one size rarely fits all, an 'off the shelf' waterjet may not truly satisfy all the requirements your company has for cutting equipment. That's where WARDJet comes in. Nearly every waterjet sold by WARDJet is customised in some way, providing you with the ideal cutting system from day one.

In terms of customisation, the E-1524 waterjet is a great example of what WARDJet is capable of. With an over/under shuttle table, engineered with a scissor lifting mechanism to load the table into the cutting area, this E-1524 takes water-only cutting to the left level, literally.

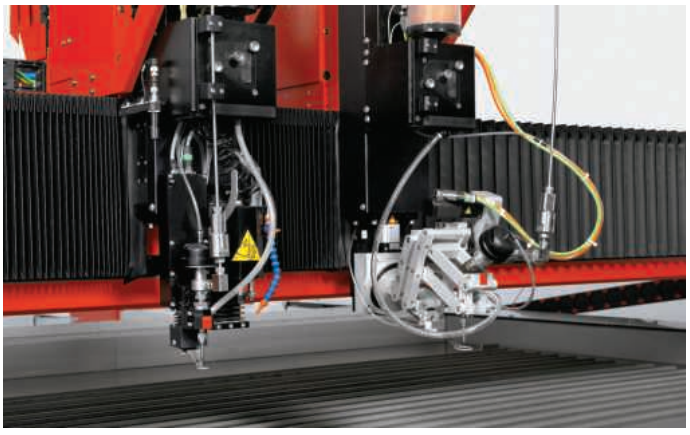
Three cutting heads on a single spreader bar with automatic head spacing can work in sync to perform production runs, or be turned off to one or two heads for jobs with less volume. After cutting is completed, the operator can load more material into the system on one shuttle table, and begin to unload the finished parts on the second table positioned safely out of the cutting area. One of the unique features of WARDJet waterjets is that even the most custom system is based off of the tested and proven designs of a standard system. This E-1524 is based off a standard E-Series waterjet, with significant tank modifications for the shuttle tables and lifting mechanism.

DSG Waterjet Ltd
Tel: 0844 5000256
Email: sales@dsgwaterjet.co.uk
www.dsgwaterjet.co.uk

3D waterjet cutting from Bystronic

2015 saw the versatility of Bystronic's ByJet Flex waterjet cutting machines expanded with the introduction of three-dimensional cutting capability. One or two 3D heads can be fitted per machine, either in the Swiss factory in the case of new equipment or in the field if existing 2D ByJet Flex users choose to upgrade.

The 3D head enables precise bevelled edges to be cut at any angle up to 45 degrees with a high level of productivity, even when making initial and final cuts in thick materials or executing fine contours with frequent changes of direction. Straight edges may be produced equally efficiently.



3D technology in waterjet cutting is becoming increasingly popular due to the growing range of applications. However, at the outset a manufacturer may not have an order book that justifies a 3D cutting system. The modular ByJet Flex allows users to generate orders for such work and convert their machine when the time is right, first with one 3D head and then with another. As the heads can be exchanged in less than one hour, they can be swapped between different sizes of ByJet Flex on the shop floor, minimising financial outlay during transition to the new technology.

The ByMotion control ensures reliable integration of 3D profiling. Developed by Bystronic, the software controls all cutting jobs on the machine platform and simplifies fast switching between 2D and 3D applications. When a 2D cutting head is exchanged for a 3D head, ByMotion automatically recognises it and, amongst other things, adjusts the cutting area margins according to the angle of the head.

Precise positioning of the head in relation to the surface of the workpiece is crucial for successful 3D processing. For example, if a cutting head at a 45-degree angle is positioned too high above the material, the cut part will be too large. Continuous, automatic height sensing in the control prevents this.

Height sensing also enables the cutting head to follow the surface and maintain a constant distance between the nozzle and the workpiece. In this way, deviations are corrected automatically that could occur due to a bent metal sheet or material lying unevenly on the cutting grid.

The kinematics of the 3D head enable precise pivoting around the A and B axes. Each head revolves around the focal point of the nozzle, enabling precise cutting without losing time or speed, while the need for complex corrective manoeuvres in the linear axes is eliminated.

Bystronic UK Ltd Tel: 0844 848 5850
Email: david.larcombe@bystronic.com www.bystronic.com

PLP goes for the full 5-axis

Precision Laser Processing has just taken delivery of its new Water Jet Sweden 5-axis machine and can't wait to get cutting. The Midlands-based firm has been in business for over 20 years, serving a range of industries including the aerospace, automotive and medical sectors and the new 5-axis waterjet adds another vital cog to its plans for expansion.

The company already provide 5-axis laser services and now, with the addition of the UK's largest subcontract 5-axis waterjet machine, is ready to take on new markets.

Having identified a strong requirement within the UK for large volume 5-axis processing, PLP, that had already been using a 2D abrasive waterjet machine, went to the market in order to identify the best technical partnership. Having travelled to visit systems in operation across Europe and technical evaluations of various machine suppliers, PLP strongly favoured the gantry design from Water Jet Sweden.

"Water Jet Sweden listened to our needs and together we worked to arrive at a configuration that best suited our requirements. We were able to specify a Duplex cutting head setup to keep our ability of twin head cutting for existing 2D jobs; this was very important to us," says PLP's Robert Trigg.

The specification included a probing system from Renishaw that allows the 3D alignment of parts and fixtures on the machine table. Robert Trigg: "Much of the work undertaken will be cutting shapes in to pre-formed parts, be that moulded composite, fabrications or machined. It is therefore essential that the features we process are perfectly aligned to the existing shape."

By using the macro commands from Water Jet Sweden's 'Panel One' HMI probing, cycles are simply programmed and executed with the workpiece offsets automatically updated each time. This guarantees the dimensional integrity of the part and removes the necessity for highly repeatable fixtures, reducing hard tooling costs for the client.

PLP understood the accuracy requirements, especially in the power generation and aerospace sectors and these were a major criteria in their technical selection. With X- and Y-axis movements of 3500 mm x 6000 mm, it is important that any machine has structural integrity and thermal stability. The Water Jet Sweden design incorporates a patented method of carrying the X-axis cross beam that allows for any thermal drift within the workshop. Using Renishaw laser inferometer and ballbar systems to calibrate the machine, the linear accuracy and dynamic performances are verified and certified. With demonstrated linear accuracy better than 30 µm over the 6 m working length and positioning accuracy better than 1 arc/min on the 5-axis cutting head, PLP has invested in one of the most accurate 5-axis abrasive waterjet systems in Europe.

Robert Trigg's favourable impression of Water Jet Sweden was confirmed during a visit to a leading subcontractor in Germany that produces carbon fibre bodies for the new BMW i3 and i8 models, alongside major structures for Airbus:

"After visiting existing facilities using Water Jet Sweden machines, we quickly recognised that we were dealing with one of the world's leading providers of Waterjet technology. They took our plans seriously from the start and worked with us to get every aspect right. Now we can't wait to get producing parts for our customers."

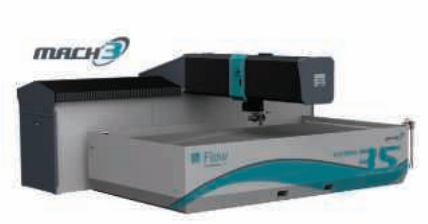
WJS UK sales director Gavin Bell worked on the project and says: "It's great that a customer like PLP has taken the step in adding a full 5-axis waterjet cutting machine. Having already had a waterjet machine they knew what they wanted to achieve and were easy and professional to work with. It will undoubtedly add to their appeal and provide an edge in the subcontract market."

WJS UK Ltd
Tel: 01937 845499
Email: info@wjsuk.com
www.waterjetsweden.co.uk

A faster return on investment

Flow is an innovation leader in the field of waterjet cutting technology and holds more patents than all other the other players combined. With over 12,000 systems already sold worldwide for all kind of applications, Flow understands what really matters for you.

To celebrate Flow Europe's 35th anniversary, it has put all of its experience and knowledge into a special anniversary edition of the Mach 3b System, with the goal of giving you the highest revenue for your business. Andreas Meyer, one of Flow's leading technical experts with 25 years of experience, explains how the Mach 3b with Dynamic Waterjet can provide this performance and revenue in a video at **http://www.edition35.com/en**



The Mach 3 is the most popular system in the industry. It has a field proven technology with thousands of installations; more than any other waterjet cutting machine. It was built to provide many years of accurate performance on an integrated and compact platform.

The Mach 3b very special anniversary edition has been built to provide many years of accurate performance, based on an integrated and compact platform.

As an option, Dynamic Waterjet XD Technology also provides taper compensation for 3D cuts. The 5-axis cutting head enables you to do so for all 2D & 3D parts Dynamic Waterjet® XD integrates 3D functionality with Dynamic Waterjet, giving you the ultimate in accuracy, speed and flexibility.

Dynamic XD is a revolutionary waterjet advancement and is industry altering in its unique features and capabilities. It offers advanced beveling and up to 60 degrees of motion. This functionality provides added versatility and allows for easy cutting of complex parts in 3D. The original Dynamic Waterjet technology was invented and patented by Flow in 2001. You can cut up to 2-4 times faster and high precision and tight corner geometry is easily completed with this exclusive technology.

Dynamic Waterjet automatically compensates for stream lag and taper, natural occurrences of the waterjet process. Its articulated wrist allows the cutting head to tilt in any direction, compensating for waterjet stream imperfections using complex mathematical models. These calculations are all completed behind the scenes, by Flow's smart FlowXpert Software Suite, without the necessity of operator participation using SmartStream Technology.

All you have to do is select the material type from the comprehensive database of tested materials, input thickness, and your part will come out perfect the first time.

Flow UK Ltd
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Service Centre solves customer problems and expands capabilities

Wisconsin Service Centre gains twice the edge with dual 5-axis waterjet from Jet Edge

There's no mistaking someone from the Badger State. They've got a determined look in their eyes, the quick step of someone on a mission and they are always busy. Busy, busy, busy. But there's a reason they are so busy: They get things done right, they solve problems and they like to stay one step ahead.

Dan Chatterton is no exception to that rule. The CEO of JACQUET Midwest is one incredibly busy man these days. In just a few years, he's grown his Racine, Wisconsin, metal service centre into one of the largest suppliers of stainless steel and nickel alloys in the Midwest, making the subsidiary of JACQUET Mid Atlantic and JACQUET Metals one of fastest growing shops in JACQUET's system of five regional US service centres.

This year Chatterton has been busy rustling up business for JACQUET Midwest's latest investment, a huge 21'x13' dual 5-axis Jet Edge EDGE X-5® precision waterjet cutting system.

This new waterjet is JACQUET Midwest's third Jet Edge system and JACQUET's 13th Jet Edge waterjet nationwide. It is being used to provide waterjet beveling and chamfering services to customers in the Midwest and nationwide through JACQUET's other service centres in Pottstown, Pennsylvania, Carson, California, Pineville, North Carolina and Houston, Texas, as well as recently acquired Rolark Group subsidiaries in Edmonton, Toronto and Montreal.

Dan Chatterton noted that JACQUET has equipped all of its service centres with large-format waterjet and plasma gantries to better serve its customers. The Racine location, which is strategically located between Chicago and Milwaukee, is the first JACQUET facility to add 5-axis waterjet cutting capabilities.

"All of the machines in the JACQUET system are large table machines because of the large plate sizes that we buy mill direct, allowing us to be more efficient with our cuts, have longer run cuts and have better nesting," he explains.

Earlier this year, he was shooting a video promoting his new 5-axis waterjet, which at that time had yet to be installed. He knew his customers would be quick to take advantage of JACQUET's new capabilities, so he wanted to get a video in front of them posthaste. One incredibly busy summer has proven him right.

Dan Chatterton says his latest waterjet system has already allowed JACQUET to be more deeply involved with its customer problem solving and to meet the increasingly tighter tolerance requirements of its OEM, fabricator and machine shop customers who support primarily the oil and gas, power generation, pollution control systems and water purification industries.

JACQUET specialises in stainless steel and nickel alloys, which it supplies to customers in 19 different stocks in a wide variety of sizes and thicknesses.

"For some time, we had been telling our customers that we were considering getting this 5-axis machine," he recalls. "They were very supportive in the concept of what we would possibly be able to do for them.

"We knew there were several areas of their business we could help them with, so once the machine was up and running in our shop it began to open up the opportunities we had always thought were there. We have been able to engage our customers more than ever because we have new capabilities that can help solve problems or bottlenecks that they have in their shops."

Going from 3-axis to 5-axis and going there fast was certainly a learning curve for JACQUET's waterjet operators, but the company took time to have their operators thoroughly trained:

"While we knew the capabilities of the machine, it has caused us to stretch our thinking and push the limits of its capabilities through many applications we have come up against," he continues. "Our operators have had to have additional training both internally and through support of Jet Edge to achieve our level of success thus far."

JACQUET's Jet Edge EDGE X-5 waterjet system is capable of processing full 8' x 20' or 10' x 20' plates. Its dual 5-axis cutting heads double production and are capable of cutting precise 3D parts from virtually any material, including bevels up to 50°. Powered by a 60,000 psi 100 hp Jet Edge iP60-100 intensifier pump, the ball-screw driven waterjet system has a repeatability of +/- .001". The system also has submerged

or above-water cutting capabilities as well as a proprietary plate mapping feature that allows precise nozzle-to-plate standoff.

"Because of the taper control that the 5-axis offers, we are able to achieve tighter tolerance from top edge to bottom edge over our other waterjet machines," says Dan Chatterton. "Most of the time we're able to achieve .002" -.003" taper."

These new capabilities have opened up new opportunities for JACQUET.

"We have begun to see more and more shaped cut outs that have contoured flights in them," he observes. "These types of parts can be difficult and time consuming for machine shops to complete. With the dual 5-axis head we can cut two parts simultaneously saving a lot of time and money for our customer."

Dan Chatterton has nothing but good things to say about his Jet Edge waterjet systems, which were manufactured close by in Minnesota:

"Jet Edge has always had a great machine. That is why JACQUET has purchased 13 waterjets to date with more to come,while JACQUET continues to grow and develop throughout the US. The Jet Edge dual head 5-axis machine has set

JACQUET apart from our competition once again. It has allowed us to become more than we were yesterday through its expanded capabilities."

A subsidiary of JACQUET Mid Atlantic, which is in turn a subsidiary of Jacquet Metals of Lyon Saint Priest, France, JACQUET Midwest is one of five JACQUET metal service centres in the United States. The company also has service centres in Pottstown, Pennsylvania; Carson, California; Pineville, North Carolina; and Houston, Texas. JACQUET recently acquired the Rolark Group service centres in Canada, with subsidiaries in Edmonton, Toronto and Montreal.

JACQUET specialises in supplying and processing stainless steel and nickel alloys for OEMS, fabricators and machine shops that support primarily the oil and gas, power generation, pollution control systems and water purification industries. JACQUET's North American service centres provide waterjet and plasma part cutting. The company stocks 19 different grades of stainless steel and nickel alloy plates in a wide variety of sizes and thicknesses.

Established in 1984, Jet Edge is a global designer and manufacturer of waterjet systems for precision cutting, surface preparation and coating removal. Jet Edge systems are used around the world in a broad range of industries, from the world's leading airlines to automotive, aerospace, industrial manufacturers, and machine and job shops. Jet Edge waterjets are proudly made in the USA.

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Aquablast Ltd
Tel: 01502 714143
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www.aquablast.co.uk
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Metal rolling improves jig manufacture for RTM carbon aero parts

Creating manufacturing jigs for the production of aerospace components requires high quality materials and precision machining. So, when parts of an original jig, which had been press-formed, started to crack, it was essential to find an alternative production method, which led to Barnshaws Metal Bending being contracted to manufacture the new components.

The aerospace industry is understandably extremely demanding when it comes to precision and quality throughout the entire supply chain, in order to ensure the highest levels of safety. The start of the manufacturing process for many components is the production jig, which has taken on a greater prominence with the growing application of resin transfer moulding (RTM) process, which is capable of producing complex three-dimensional components using carbon fibre as the structural element.

Aim Engineering is a specialist manufacturer of bespoke production tooling for a variety of industrial sectors including aerospace and it had been contracted to produce an aluminium jig for creating fan cowl components for a turbofan engine. The base for the moulds is a set of thick, curved aluminium plates that would normally have to be machined from billet to produce the exact shapes required for the carbon composite components. However, this results in high waste and cost.

Mark Adams, production planner for Aim Engineering, explains: "Initially the alternative was to create the curved aluminium from flat stock using a pressing process, but this was not ideal as we had a plate crack during testing and there were excessive tooling marks on the outer surface. This led us to look for another manufacturing method that would improve the overall quality of the design."

Barnshaws produced ten rolled aluminium sections, up to 800 mm in length and varying in thickness from 83 mm to 114 mm

As a regular client of Barnshaws, Aim Engineering already appreciated the technical abilities of the metal rolling company but was a little uncertain about the feasibility of producing these jig components using rollers. However, once the designers had discussed the requirements it was clear that, given the correct materials, Barnshaws would be able to deliver the required components.

To achieve precision and tight curvature, Barnshaws recommended the use of high quality aluminium 5083 that had been annealed to reduce the risk of cracking

The RTM process enables the cost effective production of precision components from carbon fibre materials as it requires less manufacturing time than more traditional methods using an autoclave. RTM uses a vacuum to draw the resin into the carbon fibres and ensure that all the air bubbles are expelled before the resin cures.

In order for the process to be robust and reliable, the production jig must be strong enough to withstand the repeated application of pressurised resin and the vacuum system. In addition, the mould must be precision machined with an excellent surface finish as this determines the quality of the final components. In all, Barnshaws produced ten rolled aluminium sections, up to 800 mm in length and varying in thickness from 83 mm to 114 mm. The level of precision required for the curvature of each section was required to hundredths of a degree, with eight different radii specified for the sections ranging from 101.09° to 212.40°.

To achieve such precision and tight curvature, Barnshaws recommended the use of high quality aluminium 5083 that had been annealed to reduce the risk of cracking. This was then passed through precision controlled rollers to gradually bend the flat aluminium stock until the final dimensions were achieved.

The level of precision required for the curvature of each section was required to hundredths of a degree, with eight different radii specified for the sections ranging from 101.09° to 212.40°

Once the new precision-curved aluminium components were delivered to Aim Engineering they were machined to suit a number of components for the turbofan engine. The superior quality of the thick aluminium segments produced by the rolling process ensured that there was now no scrappage either of the tooling components or of the aircraft production parts.

Barnshaws Steel Bending Group
Tel: 0121 557 8261
Email: matthew.pritchard@barnshaws.com
www.barnshaws.com

Prima Power launches new Laser Genius 2D laser with linear drives

The new Laser Genius from Prima Power combines linear drives, a carbon fibre carriage and a synthetic granite frame to produce dramatic speed and axis acceleration improvements from a dynamically stable and accurate structure.

Thanks to this, power options up to 6 kW can now be exploited to the full potential of the high brilliance laser source which, requiring no laser gases and with its highly reliable, full solid-state fibre laser technology, delivers low operating costs in line with Prima Power's Green Means® philosophy for sustainable manufacturing.

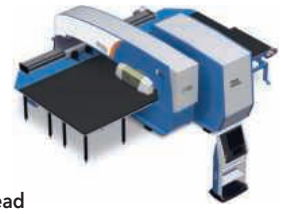
Prima Power's SMART Cut, MAX Cut, Night Cut, single focusing lens and automatic nozzle changer offer users advanced productivity functions which greatly reduce cycle times and increase process reliability, allowing Laser Genius to deliver maximum productivity at minimum cost.

Laser Genius also includes Prima Power SIPS safety impact protection to prevent damage to the laser head in the event of a collision and OPC quick alignment. The machine comes with a choice of two cabin designs, Lean cabin for the minimum footprint and easy installation and Open cabin with fully sliding doors and roof for maximised access flexibility.

With over 2000 2D lasers in use around the world, Prima Power is a leader in laser cutting technology and, with Laser Genius, has launched a high performance machine designed for 24/7 production. Coupled with the wide range of automation options available from Prima Power, Laser Genius will deliver low cost, reliable production day after day.

The Prima Power Group offers a complete range of equipment for the sheet metal industry. With over 30 years of experience, it has over 10,000 machines installed in more than 70 countries. It has manufacturing facilities in Italy, Finland, the USA and China and it offers sales and service through a worldwide network of Group companies and distributors. Its range of machinery covers bending, punching, punch-shear, laser, combi and FMS. Automation through automatic loading and unloading, transfer between stations and buffering are highly important for modern productivity. Prima Power can provide a range of solutions and software systems tailored to suit manufacturer's requirements, even for the most complex applications.

The new Laser Genius from Prima Power


Laser Genius head

Prima Power UK Ltd
Tel: 0844 4996241
Email: paul.downs@primapower.com
www.primapower.com

LVD launches Phoenix fibre laser

The Phoenix FL completes LVD's fibre laser line up, uniting cost-efficient and dynamic laser cutting and LVD's laser automation possibilities.

The Phoenix offers the perfect balance between performance and price. The compact, modern machine design includes a welded steel frame construction that minimises deformation caused by high acceleration thus improving overall machine accuracy. Powered by a high efficiency solid-state doped fire laser source, the fibre laser provides fast, accurate processing of various sheet thicknesses and types. The Phoenix FL features a lightweight, high rigidity beam delivery system to allow for highly dynamic processing.

The Phoenix maximises uptime with an integrated automatic shuttle table system that allows one table to be loaded while the machine is cutting on the other table. Table change time is only 30 seconds. LVD's touch screen control and user interface, TOUCH-L, make the Phoenix easy to use and operate. TOUCH-L employs a 19" touch screen and icon driven user interface to efficiently and effortlessly guide the user through all necessary man-machine interactions.

TOUCH-L also incorporates a part programming and nesting feature allowing users to import drawings directly into the control, applying cutting technology and nesting sheets at the machine.

The Phoenix FL features the latest in fibre laser source technology with a wall plug efficiency of up to 30 percent. The maintenance-free fibre laser resonator utilises the latest fibre laser technology for reliable trouble-free performance.

Modular automation options further increase the productivity and throughput of the Phoenix FL. The options are the Compact Tower (CT-L) and the Flexible Automation for Lasers (FA-L) developed by LVD.

The PHOENIX FL is LVD's answer to dynamic and cost efficient laser cutting

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A third Mecal machining centre for Neville Precision Engineering

Neville Precision Engineering, one of the UK's leading names in the design, prototyping and manufacture of aluminium extruded products, has taken delivery of a third Mecal CNC machining centre from West Midlands-based cutting and sawing technology specialists, Addison Saws.

Believed to be the fastest of their kind, the two Mecal CNC machining centres bought earlier this year by Neville Precision Engineering from Addison Saws are 4-axis models and are used to manufacture 40,000 aluminium door sill plates a year for one of the world's premier automotive brands. By comparison, this latest machine to be purchased by Neville's is a 5-axis Mecal MC304 Ariel-5 MDT, the first 5-axis machining centre of its type to be sold in the UK by Addison Saws.

The 5-axis Mecal MC304 Ariel-5 MDT brings greater flexibility to Neville Precision Engineering

"For a new contract, which involves the manufacture of some 10,000 aluminium carriage light fittings a year for the next generation of high-speed trains, I initially considered purchasing an additional Mecal 4-axis machine," comments Neville Precision Engineering's managing director, Edward Neville. "During a visit to Mecal's HQ with Addison Saws for machining trials, however, I was able to see the latest generation Mecal MC304 Ariel-5 MDT, 5-axis CNC machining centre. A demonstration confirmed that it was precisely what I was looking for. "

With full 5-axis capability, the Mecal MC304 Ariel-5 MDT allows the cutting tool to approach the component from all possible angles, in order to complete cutting and machining operations on the top, bottom, sides and ends. This has brought immense flexibility to Neville Precision Engineering's carriage light manufacturing cycle, where finished components measuring 2 metres long x 200mm wide are produced from 4.5-metre-long extrusion bars.

This latest investment in CNC machining technology by Neville Precision Engineering has enabled the company to reduce machining cycle times significantly, removing any need for components to be manually repositioned during the manufacturing process. The Ariel-5 machining centre is equipped with an optional, fully independent clamping system and also offers Neville Precision Engineering considerable opportunities for component development.

"We are delighted to be able to offer both the MC304 Ariel-5 MMI and MC304 Ariel-5 MDT models," comments Addison Saws' sales director, Chris Wilson. "Highly robust and competitively priced, these latest CNC machining centres from Mecal bring new levels of flexibility and convenience to customers who produce components from extruded aluminium."

"Once again, Addison Saws has provided a high quality solution for our demanding manufacturing strategies," adds Edward Neville. "Our new CNC machining centre has also brought exciting possibilities to our component development capabilities."

The new Mecal MC304 Ariel-5 MDT machining centres from Addison Saws are able to automatically machine, drill, mill, slot and cut aluminium extrusions of up to 7.5 metres in length. Providing immense flexibility, thanks to their additional rotary axes, Mecal Ariel-5 models are equally well suited to new product development, as well as to complex machining tasks.

Features include: mobile 12-position rotary tool magazine; fully-motorised self-positioning vices; vice movement during machining cycle (optional); 3D graphical software with external CAD link available; powerful 11 kw HSD spindle; fibre-optic high-speed data communication; dual loading zones for seamless production; rear safety mesh fence; central automatic lubrication system.

Established in 1956, Addison Saws Ltd 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, almost sixty years on, Addison Saws Ltd. 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 Ltd. 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 Ltd. is part of the Addison Group, an organisation that also includes sawblade re-manufacturing specialist Dynashape Ltd and tube-bending technology specialist, Tubefab.

Addison Saws
Tel: 01384 264950
Email: sales@addisonsaws.co.uk
www.addisonsaws.co.uk

New bandsaw for cutting metal tube

Specifically for cutting tubular material, KASTO has introduced a new bandsaw, called KASTOwin tube A 5.0, on which the blade cuts from the bottom upwards, the reverse of the action on other bandsaws. 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, as the delicate teeth were invariably damaged. A bimetal blade was the only option. This is a thing of the past with the KASTOwin tube A 5.0, on which TCT blades may be used without fear of premature wear.

The automatic saw has a feed mechanism rotated through 180 degrees so that the cutting action starts at the surface supporting the stock. Capacity is 500 mm diameter for round tube and shortest cutting length is 10 mm. The frequency-controlled drive can be adjusted steplessly to deliver a cutting speed between 12 and 150 metres per minute.

The upfeed is equipped with zero-play linear guides, while ballscrews ensure controlled cutting and material infeed. The saw band is clamped in position hydraulically for cleaning by a replaceable, electrically driven chip removal brush.

The intelligent SmartControl ensures easy operation and, as it contains a comprehensive material database, is able to set all sawing parameters automatically for nearly all types and cross sections of material.

In addition, a new KASTOrespond feature continuously records the force on the tool, without the need for additional sensor systems that are often fault-prone. An intelligent algorithm continually varies the feed rate so that the force on the blade is maintained at a constant, optimised value.

The feature was developed for the KASTOwin tube A 5.0, as tube in particular presents a blade with widely varying conditions throughout the cut, especially at material breakthrough. It is, however, applicable to cutting all types of stock.

The tube saw boasts all of the benefits that characterise other units in the German-built KASTOwin series. Since all models are built to a similar design and the components are mostly identical, KASTO is able to offer this range of automatic production bandsaw saws at considerably more attractive prices than comparable products, without compromising quality.

KASTO Ltd
Tel: 01908 571590
Email: sales@kasto.uk.com
www.kasto.uk.com

FICEP RAPID - the name says it all

It was another successful EMO show for FICEP, where it showcased RAPID, its latest CNC high speed drilling line line for angles and flats offering high productivity, quality, flexibility, accuracy and lower production costs.

The machine's powerful spindles with their high rotational and feed speeds, together with the new generation high performance tools, enables the use of cost-efficient indexable carbide drilling tools to further enhance productivity.

The CNC materials handling system loads the angles on to the conveyor track which then automatically clamps the workpiece in position and every process then takes place sequentially.

The two drilling heads are equipped with very powerful direct drive spindles and an automatic tool changer with six positions for each of the spindles. The CNC system controls spindle positioning, feed rates and linear guides with controlled servomotors and ball screws ensure maximum precision on every axis. A new additional auxilliary axis of 200 mm allows independent control of the two spindles in the length or X-axis. The independent movement of the two auxilliary axes while an angle is stationary maximises the productivity achievable with each spindle within the stroke.

The RAPID CNC drilling lines are also modular and can therefore incorporate scribing, hard stamp marking, single or double shearing or alternatively, high speed circular carbide saw.

Optional hard stamping CNC marking units have eight selectable cassette types, each one including 13 characters.

Depending on the RAPID model, fast cutting is provided by either a single cut hydraulic shearing unit or a high speed circular saw with hardened carbide inserts.

The processed angles, scrap or swarf created after the saw or shearing operations, can be automatically offloaded at predetermined or selectable positions along the unloading area to reduce manual handling and sorting. This further improves the productivity of the process with handling of components being minimised.

The RAPID offers faster drilling and scribing speeds at minimum cost, slotting in any direction, angle heel milling, and other machining features. The option of using indexable carbide drilling tools it allows the machine to be one of the fastest on the market today.

FICEP UK
Tel: 01924 223530
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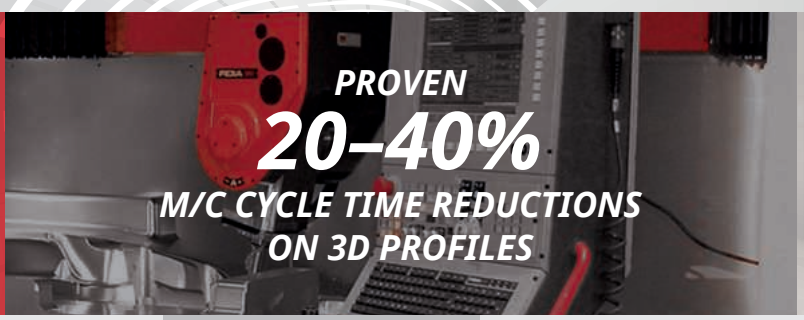

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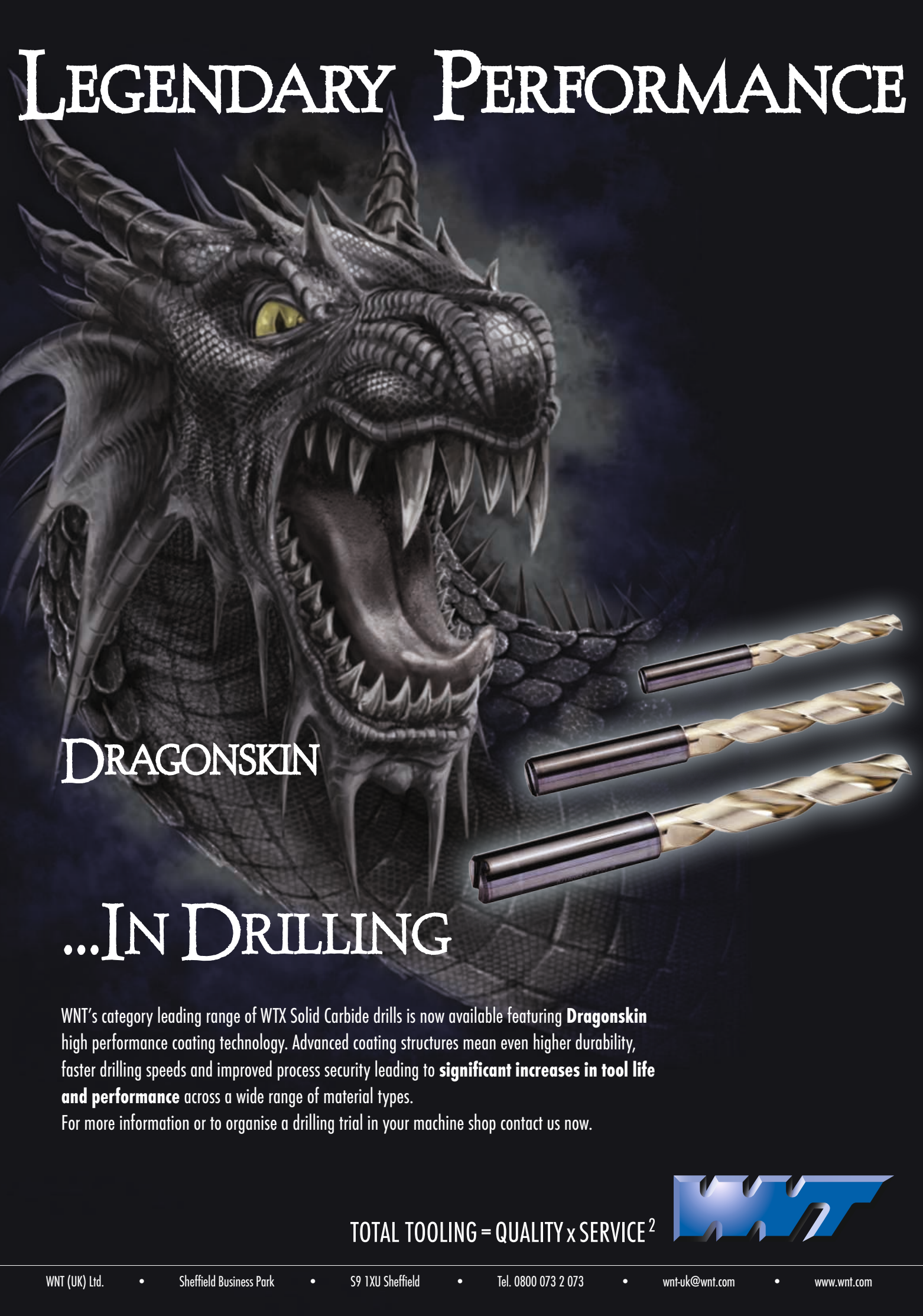

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