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DMG MORI showcases a range of key building blocks at AMB

In keeping with previous shows, DMG MORI will showcase a cross-section of its most innovative technologies at AMB 2016. With around 30 exhibits from the fields of turning, milling and advanced technologies on an exhibition area of over 2,000 m², the machine tool producer will be giving visitors a glimpse into the future of production. Innovations on show during the trade fair will include the third generation DMU 50 and the Robo2Go automation solution that can be used on several machines without any knowledge of robots.

A key building block in DMG MORI's customer-oriented digitalisation strategy is the app-based CELOS® system, that the machine tool manufacturer first presented around three years ago and which it has consistently continued to develop in a targeted manner ever since. Using this uniform user interface for machine and office PC, employees involved in shop floor and job scheduling can manage, document and visualise all job order, process and machine data.

A 30 percent time saving in tooling times, 50 percent less time and effort for the calculation of technology values or the search for important information are just a few of the effects that can be achieved with CELOS

Thanks to its open architecture, CELOS allows the exchange of information with higher–level structures, in addition to the impact it has in the shop floor area. In this way, customers are offered complete integration of their machines in the company organisation while simultaneously creating today the interface of metal cutting production in the cyber-physical production system of the future. The benefits in day-to-day operation are convincing: a 30 percent time saving in tooling times and 50 percent less time and effort for the calculation of technology values or the search for important information are just a few of the effects that can be achieved with CELOS. Customers also profit from the continuous further development of the CELOS system, because with every new release DMG MORI implements 50 enhancements. In addition, DMG MORI will be presenting ten new CELOS APPs at AMB. These will include the new CELOS DEVELOPER APP, with which partners will be able to develop their own APP for the very first time.

For more in depth coverage of DMG MORI's offering at AMB, turn to page 12.

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The best is yet to come

by Roger Barber

With so much gloom and doom permeating the media, it is great to report some good news for a change. Far from being on a downward spiral since the Brexit vote, the future is looking positive, especially for UK subcontractors.

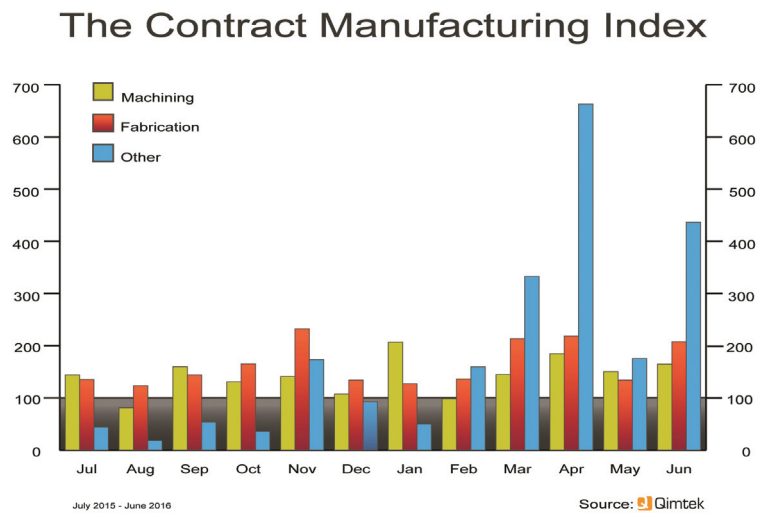
The latest Qimtek Contract Manufacturing Index (CMI) shows that the value of the UK contract and subcontract market rose by 21 percent in the second quarter of 2016 compared to the first quarter, despite uncertainty in the months leading up to the Brexit vote. There was still a high degree of volatility in the market. Although the demand for machining stayed relatively steady, both fabrication and other processes, including electronics and plastic moulding, dropped sharply in May, only to recover strongly in June. The underlying trend was extremely positive, with the index rising from 109 in the second quarter of 2015 to 188 in the same quarter in 2016, a year-on-year rise of 72 percent.

The CMI is produced by sourcing specialist Qimtek and reflects the total purchasing budget for outsourced manufacturing of companies looking to place business in any given month. This represents a sample of over 4,000 companies who could be placing business that together have a purchasing budget of more than £3 billion and a supplier base of over 7,000 companies with a verified turnover in excess of £25 billion.

Looking at the figures by process, machining was 11 percent up in the second quarter of 2016 compared to the first quarter and represented 50 percent of the total market, compared to 54.5 percent in the previous quarter. Compared to the same quarter in 2015, machining rose by 64 percent.

Despite a dip in May, fabrication came in 18 percent up on the previous quarter and 54 percent up on the previous year, with fabrication accounting for 38 percent of the market.

At the recent Farnborough International Airshow, the headline was the announcement of a major multi-billion pound agreement from Boeing to buy nine P-8A Poseidon maritime patrol planes and to upgrade 50 Apache helicopters, creating a further 2,000 jobs in the UK. The company also announced a partnership with the government to work together in the buiding of a new £100 million P-8A operational support and training base at RAF Lossiemouth in Scotland. Sir Richard Branson also signed a deal with Airbus for 12 Airbus A350s. In total, there were 191 orders announced for civil aircraft across the show totalling £12 billion, according to the Midlands Aerospace Alliance. Airbus itself ended the show with 279 orders and commitments totalling $35 billion.



On the Monday of the show, David Cameron's office also announced a further £365 million of funding for aerospace research and development, to be jointly provided by industry and the government.

In the automotive sector, John Leech, head of automotive at KPMG UK, comments: "In recent months, we have seen some industry commentators believe that new car sales could top three million in the coming years."

He anticipates that UK car production will grow by double digits in 2016 to 1.7 million cars, driven principally by EU exports buoyed by the lower value of the pound.

Meanwhile, Karen Finegold of the Engineering Industries Association points out that UK companies have an excellent opportunity to build their export business outside the EU by participating at the leading manufacturing events in the ASEAN. These include BITEC, Asia's largest machine tool and metalworking event in Bangkok, Thailand from 23rd to 26th November 2016 and Manufacturing Indonesia in Jakarta, Indonesia from 30th November to 3rd December 2016.

With over 600 million people, ASEAN's potential market is larger than the European Union or North America. ASEAN is one of the most open economic regions in the world, with total merchandise exports of over $1.2 trillion, nearly 54 percent of ASEAN GDP and 7 percent of global exports.

The Engineering Industries Association is organising UK Pavillions at both of these shows. For further information contact Karen Finegold, email: **karen.finegold@eia.co.uk**

In his recent speech at the Margaret Thatcher Lecture, former Chancellor George Osborne was extremely positive about Britain's future, explaining the strengths of the free market and the opportunities that lay ahead. He confirmed the former Prime Minister's optimism in believing that Britain's best days lay ahead, a view that he shares today: "I am an optimist and so do I."

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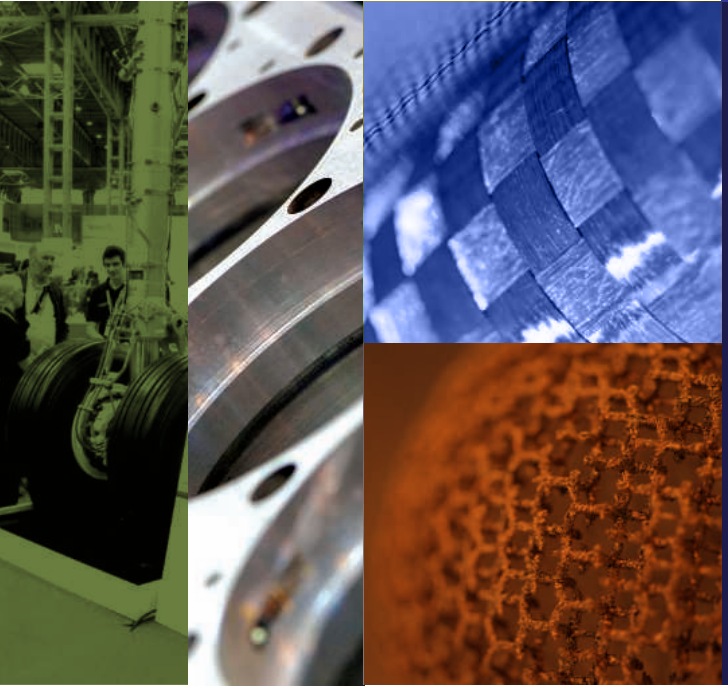

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"Quality drives productivity"

Hexagon opens new metrology facility for subcontractors

The brand new MEPC metrology facility has been officially opened at Silverstone Park managed by Hexagon Manufacturing Intelligence.

The purpose-built, 3,000 sq ft, state-of-the-art facility has been set up within the Innovation Centre of Silverstone Park and officially opened its doors on 15th July with an event attended by an impressive array of local dignitaries and technical editors.

Roz Bird, commercial director of Silverstone Park, says: "We are delighted to be working in partnership with the team at Hexagon Manufacturing Intelligence to launch this fantastic new facility, which will provide SME businesses with unique access to a wealth of support and specialist expertise."

Roz has been instrumental in driving forward MEPC's ambitious plans to transform the Silverstone Park brand and business proposition, which upon completion, will see over 200 companies across the high-tech sectors based on the site.

Hexagon Manufacturing Intelligence general manager, Brett Green says: "Hexagon Manufacturing Intelligence has been at the forefront of the motorsport sector for many, many years, helping manufacturers and engineers develop components, parts and finished vehicles. In the UK the motorsport sector is worth in excess of 10 billion pounds, the vast majority of which is centred within 100 and 150 miles radius of this location. Our interests and our own activities at Hexagon extend from 4-wheel to 2-wheel motorsports. For over 10 years we have been a technical partner to Red Bull Racing in Milton Keynes and over those years they have really helped and challenged us to improve our products, our services and our operating, and we hope to bring some of that challenge and improvement to this centre here. We have also more recently become a technical partner to the FIM World Superbike Championships and we provide valuable data all around the world.

"So really when we first considered coming to Silverstone Park, it was the motorsport connection that caught our interest. However, this has developed and together with our partners at the MEPC we have identified a huge amount of local companies, both large and small, operating in diverse sectors. What we have found is that the common denominator for all those businesses is the determination to produce at the highest quality.

"So together with our partners at the MEPC, these are the customers that we will focus on, to provide them with what we call datable information on which they can make informed decisions that improve their processes. For example, we have work going through the facility now from the aerospace sector, the defence sector and the medical sector. These are typical of the small businesses that can benefit from the services that we are providing.

"We believe that quality drives productivity."

John Drover, sales manager for Hexagon Manufacturing Intelligence, says: "We are absolutely thrilled to be launching this specialist facility within the iconic Silverstone Park and are hugely excited about the real, tangible difference this will make to not only SME and start-up businesses but to the engineering subcontractor industry as a whole.

"Our engineers and application metrology specialists are able to deliver

inspection, validation and quality control of components through the use of Hexagon systems which are capable of measuring to the sub-micron level, enabling our customers to achieve high performance and accuracy each and every time. Being able to verify and validate predefined standards for accuracy, reliability and precision is something that many smaller businesses are unable to achieve due to financial restraints and restrictions.

"Through this new facility, we are opening up exclusive access to both equipment and support to enable Tier 2, 3 and 4 suppliers across the UK to achieve first-rate provable standards. By also offering dedicated training programmes, along with networking opportunities, this new facility will not only help facilitate growth and development across the SME sector, but will help raise standards industry-wide."

Hexagon believes that start-up and SME businesses in Britain deserve the very best support and its vision is to revolutionise the future for these enterprises across the advanced engineering world. This will be achieved by providing unique access to the most cutting-edge equipment available, opportunities to network and develop relationships, with access to world-leading training and development.

For further information regarding Hexagon Manufacturing Intelligence's new Metrology Facility at Silverstone Park, contact:

Hexagon Manufacturing Intelligence
Tel: 0870 446 2667
Email: silverstonemetrology@hexagon.com
www.hexagon.mi.com

BEL purchases first ETG supplied Pietro Carnaghi mill/turn centre

BEL Engineering, a division of Newcastle upon Tyne-based British Engines, is the first UK purchaser of a Pietro Carnaghi Flexturn 25 large capacity multi-tasking machining centre following Carnaghi being represented in the UK by the Engineering Technology Group.

BEL Engineering offers subcontract machining services specialising in large capacity, heavy duty, horizontal machining projects working in sectors from power generation to oil and gas, renewables, marine and heavy machinery. BEL Engineering's large

Photographed after placing the order for the Pietro Carnaghi Flexturn 25 W, left to right: Mario Ottolenghi, sales manager for Pietro Carnaghi, Phil Westgarth and Jonathan Lamb of BEL Engineering and Stewart Cousins, UK sales and marketing director for the Engineering Technology Group

capacity business is based at a state-of-the-art manufacturing facility in Cramlington, Northumberland and is equipped with a £3 million-plus investment in world-class machine tools.

The Carnaghi Flexturn 25 W Ram is a 6-axis milling and turning centre equipped with a 6 pallet FMS system. Three pallets are circular 1.6 m diameter units and three are of a 1.6 x 1.8 m oblong configuration.

With this machine, BEL has the capability to remove and alternate the machining heads in a range of configurations including both boring and facing heads. The onboard tool changing capacity has 252 toolholder locations.

Jonathan Lamb, CEO of BEL Engineering explains the company's decision to purchase a Carnaghi machine: "For the type of machining projects we are expecting to put on the Flexturn, Pietro Carnaghi has a superb pedigree. Further, the detachable nature of the machining heads gives us tremendous flexibility while ensuring we protect unused heads in what is a very unforgiving machining environment.

"The Flexturn will become integral within our large milling and turning cell and will give us an integrated range of benefits including great capability, larger capacity and extended machining hours for lights out operation," he adds.

As well as its significant pallet capacities, the Flexturn 25 W has X and Y axes travels of 2,100 mm with 1,100 mm on the Z and 1,000 mm on the W.

The machine is scheduled for delivery into BEL in the summer of 2017.

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Email: djames@engtechgroup.com www.engtechgroup.com

Northern Manufacturing & Electronics 2016

Northern Manufacturing & Electronics, the North's top manufacturing and engineering technology exhibition, returns to EventCity, Manchester on September 28th to 29th. The event has grown consistently over its three year history, and is again expected to show an increase in both visitors and exhibitors for 2016.

Its convenient location close to Manchester city centre has helped Northern Manufacturing & Electronics to rapidly establish itself as the key exhibition in the North for industry, engineering and manufacturing. In particular, the show has become a very important event for the subcontracting sector, both as a showcase for the latest machining and production technologies, and as a marketplace for the wide range of engineering services available across the region. A central feature of the show is its RoadRailAir zone, highlighting the region's considerable supply chain strengths in the automotive, public transport and aerospace manufacturing sectors. 22 percent of the UK's Aerospace industry, itself the second largest in the world, is located in the North West, generating billions of pounds of revenue every year. Supporting this industry is a supply chain of hundreds of firms, the majority of which will be participating in the show either as exhibitors or visitors.

Last year's exhibition attracted nearly 3,000 engineering professionals from across the region. For over 40 percent of these visitors, the show's impressive line up of machinery manufacturers provided the main incentive to attend. This year is no different, with major machinery vendors such as Amada, Bystronic, Yamazaki Mazak, HPC Laser, Unison, CMZ, Haas Automation, XYZ Machine Tools and TRUMPF providing an excellent opportunity to evaluate the latest machinery side-by-side at a single event.

Shown for the first time in the UK, the new TRUMPF TruBend Series 5000 has become the firms most successful press brake worldwide. The centrepiece of TRUMPF's presence at Northern Manufacturing 2016, the new model is designed for high productivity, from programming and tool set-up through to the bending process itself. Two innovative angle measurement systems enhance accuracy and repeatability. The machine also introduces a new control concept that is revolutionary in its simplicity and intuitive to use. It's eco-friendly too as it only consumes energy during the bending process.

Haas Automation believes its UMC-750 universal machining centre (UMC), for 3 + 2 and simultaneous 5-axis machining will prove a popular attraction at the show for SMEs looking to make a cost-effective switch to 5-axis machining. The UMC was designed and built based on what users said they needed in a universal machine, resulting in what Haas Automation says is a high-performance CNC machine tool for a fraction of the usual cost associated with machines of such significant capability and high quality.

Visitors to the Amada stand will see the multi-award winning Ensis AJ fibre laser cutter. It recently added the Natural Resources Agency and Energy Efficient Award from the Japan Machinery Federation (JMF) to its haul of silverware, as well as a prize awarded by the Japanese Ministry of Economy, Trade and Industry (METI), two by the Natural Resources

Energy Agency and nine other awards by the JMF. The fibre laser machine adapts to a range of thin and thick materials. It is able to process material usually associated with a 4 kW machine with both the speed and quality using only a 2 kW oscillator, saving energy, time and costs.

However, the big-ticket machinery is but one aspect of an event that genuinely offers something for everyone. Alongside the big names are a supporting cast of hundreds, offering a vast selection of tooling, production aids, components, consumables and industrial fixtures and fittings.

Quickgrind returns to Northern Manufacturing with its vast range of solid carbide cutting tools, together with its distributor for the North and Scotland, Alliance Tools. Also joining the stand is sister company Quickvend, showcasing its award winning, versatile and convenient vending machines, perfect for cutting tool stock management. Other notable names for 2016 include Faro and Nikon Metrology, igus, Olympus and Kabelschlepp Metool.

The variety of subcontract services on

show at Northern Manufacturing is just as comprehensive, making the show a great place to locate new suppliers. The range of services on offer includes precision engineering, laser cutting and marking, electronics assembly and specialist coatings amongst others. Alongside the RoadRailAir feature, highlighting firms with particular expertise in aerospace or automotive, are a number of Technology Trails designed to guide visitors within the show, making it possible for them to make the most effective use of their time. Some of the well-known names in attendance include Orbital Fabrications, JJS Manufacturing B&B Coatings, Jenks & Cattell, European Circuits, and Laser Lines.

Business management and service providers are also well represented at Northern Manufacturing 2016. Examples include training providers such as STEGTA and asset finance specialists Close Brothers and Finance for Industry. Again there is plenty to see, with a wide variety of firms present offering solutions in areas such as industrial cleaning, stock control, industrial lighting, consumables, health & safety equipment, manufacturing software and pretty much everything else required to operate an engineering enterprise more cost-effectively and efficiently.

The free seminar programme is yet another strong selling point for the show. Over a fast-paced two-day programme, presenters from both trade organisations and commercial enterprises will address a wide variety of technical and operational themes in a series of hour-long sessions running over the two days of the show. As with the show itself, access to the seminar sessions is free of charge, making this a superb chance to listen to world-class presenters consider the newest ideas in manufacturing, engineering and industrial management.

Entry to Northern Manufacturing & Electronics 2016 is completely free to business visitors, and Event City offers 3000 free on-site car parking spaces, with easy access by road, rail or air. To register online for tickets, visit **www.industrynorth.co.uk**

Visitors can also follow all the latest news from the show at:
linkedin.industrynorth.co.uk
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Rainford brings micro machining expertise to Manchester

Industry leader in the 'micro' machine tool and cutting tool technology arena, Rainford Precision will have all its latest innovations on show at the Northern Manufacturing exhibition from the 28th to 29th September. For engineers looking to solve problems regarding micro or very high precision machining, in all material types, Rainford will have the desired tooling solutions on Stand F80 at EventCity in Manchester.

For manufacturers looking for 'material specific' tooling solutions, Rainford will be showing the impressive Louis Belet range of cutting tools specific for aluminium, brass, stainless steel, titanium and composite materials. The Swiss-manufactured Louis Belet range encompasses solid carbide and PCD end mills, drills, circular and hob saws, threading and gear cutting tools as well as a host of special tooling lines.

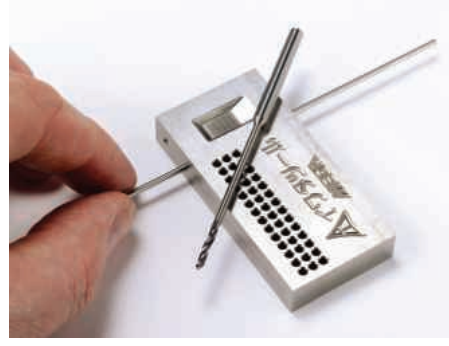
The Louis Belet brand focuses on material type and application. Built on decades of expertise, the company's engineers have perfected the right tool geometries and coatings for specific material types. Unlike alternative tooling suppliers, the Louis Belet approach matches an endless variety of tool grades and coatings with innovative geometries for all applications.

Furthermore, as a specialist that works with the world-leading Swiss 'micro manufacturing' industry, the majority of the Louis Belet product lines are available in diameters starting at 0.1 mm. In fact the 370

EXPERT drills for Stainless steel increment in 0.01 mm steps between 0.5 mm and 1.5 mm, ideal for sliding head machine users.

Alongside the micro machining Louis Belet range will be the Samurai Series of end milling cutters from Union Tool SA. This extensive range incorporates a complete line of two, three or four fluted cutters with a square or ball nose variant for machining all material types. The diversity of the solid carbide Samurai range provides up to 59 tool types from 1 to 12 mm diameter. This comprehensive offering makes the Samurai range, the tool of choice for the mould & die, aerospace, automotive, medical and general subcontract industries.

The high-end tooling lines from Louis Belet and Union Tool will be complemented by specialist tooling lines from Iwata, Xactform, Hobe and Osawa at the Manchester exhibition. Appearing on the stand beside the most extensive 'micro' tooling line in the UK will be the hand-held or machine mounted high speed spindles from US based Air Turbine Tools (ATT). The ATT series of machine mounted spindles can be retrofitted to machine tools to deliver constant high speeds of 30,000, 40,000, 50,000, 65,000, or 75,000 rpm. This makes the spindles suitable for a variety of operations with small cutting tools.



Since 1991, Rainford Precision Machines has supplied the precision engineering industry in the UK and Ireland with machines and cutting tools of the highest calibre. The company's passion for precision engineering shines through in its knowledge of its tooling range and its applications. Rainford regularly investigates machining problems presented by machine users, proposes manufacturing solutions and methods, and provides expert advice, in order to keep customers at the forefront of technology.

For further details on how to improve your precision, productivity and performance with industry leading tools, or for a demonstration on how the Air Turbine spindles can optimise machine tool performance through higher speeds and feeds, visit the Rainford Precision **Stand F80** at Northern Manufacturing, or contact:

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Email: sales@rainfordprecision.com
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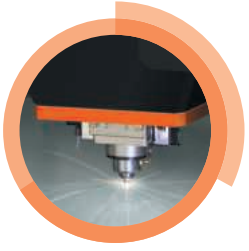

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A glimpse into the future of machine tool construction

The leader of innovation in machine tool construction offers ideal ways of achieving digital transformation with its DMG MORI Software Solutions

In keeping with previous shows, DMG MORI will showcase a cross-section of its most innovative technologies. With around 30 exhibits from the fields of turning, milling and advanced technologies on an exhibition area of over 2,000 m² the machine tool producer will be giving visitors a glimpse into the future of production. Innovations on show during the trade fair will include the third generation DMU 50 and the Robo2Go automation solution that can be used on several machines without any knowledge of robots.

DMG MORI Software Solutions
Products and solutions for digital transformation

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Workshop-oriented programming is still of great importance, especially in single item production and the production of small and medium-sized quantities, and it will remain just as important for a long time to come. Working with cycles is state-of-the-art in this respect and the reason why standard cycles in turning, milling and drilling have long been part of the scope of performance of modern controls.

Based on its decades of application experience, DMG MORI has gone far beyond the standard and currently has 24 exclusive DMG MORI technology cycles for the fields of turning/turning-milling or rather milling/milling-turning in its portfolio. These enable operators in the workshop to programme even complex machining tasks themselves directly on the machine via a dialog using parameterised context menus up to 60 percent faster. Outstanding examples here include the machining of free-form surfaces using 5-axis interpolation or various cycles for gear cutting or gearwheel production. Other cycle highlights include the MPC (Machine Protection Control) for the protection of machines, workpiece and tool, the 3D quickSET® toolkit for checking and correcting the kinematic accuracy of 4 and 5-axis machines or the Application Tuning Cycle for the process-oriented tuning of feed drives in relation to the table load at the push of a button.

The large variety of DMG MORI technology cycles contributes to process reliability in workshop-oriented programming, improves component qualities and enables integration of technology

World premiere: DMC 160 U duoBLOCK
Maximum productivity in heavy-duty machining

DMG MORI has always responded to growing demands on components with future-proof CNC technology. The latest example of this is the new DMC 160 U duoBLOCK®, which will be available as of this year's AMB. The 5-axis universal machining centre with pallet changer is based on the proven duoBLOCK principle and in its 4th generation offers 30 percent more stability and accuracy while at the same time reducing energy consumption by 30 percent. Innovative highlights of the world premiere include the new 1,800 Nm 5X-torqueMASTER® gear spindle and a travel path in the Y-direction that has now been lengthened from 1,250 to 1,600 mm.

Heavy-duty machining is now part of routine work in the field of mechanical engineering generally, in the aerospace branch, for example, or the automotive industry for the production of chassis parts and engine blocks. In this respect the sturdy construction of the patented duoBLOCK concept offers the perfect basis for both productive and high-precision machining on the DMC 160 U duoBLOCK. Its extensive cooling measures in the machine bed and base plus its wide linear guides, drives and the spindle also boost the long-term accuracy of this universal machining centre. The pallet changer of the DMC 160 U duoBLOCK can handle workpieces weighing

Proven duoBLOCK concept in its fourth generation: the DMC 160 U duoBLOCK

up to 4,000 kg, while travel paths of 1,600 x 1,600 x 1,100 mm mean the workpieces can also have extremely large dimensions.

World premiere: 2nd Generation DMC 210 U
Productive heavy-duty machining with pallet changer

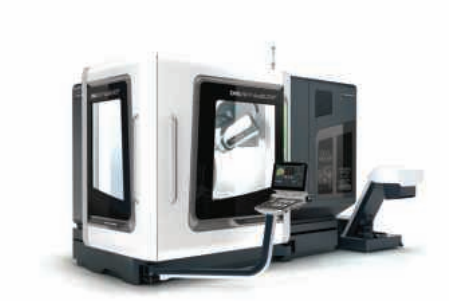
Maximum rigidity and long-term accuracy have always been the outstanding features of the portal machines from DMG MORI. The machine tool manufacturer has optimised these even further in the second general of this successful series. With a large cube-shaped work area and a high-performance spindle programme plus CELOS in the standard version, the new DMU 210 U is perfectly equipped for the rising demands on the market. Thanks to its numerous equipment options this machine, which will be available just in time for the AMB, is ideally suited for mechanical engineering in general and in particular for sectors such as tool and mould making and aerospace. The large cube-shaped work area with travel paths of 2,100 mm in the X and Y directions and 1,250 mm in the Z-axis offer ample space here.

The fast and innovative wheel magazine can hold up to 303 tools (SK50 / HSK-A100) with lengths of maximum 900 mm despite its minimum space requirement. The standard chain magazine has 60 tool pockets and offers the option of holding a 30,000 rpm pick-up motor spindle. With a torque of 1,800 Nm, 52 kW output and 8,000 rpm, the 5X torqueMASTER is a special highlight among the other available spindles. Thanks to its extended swivel range and optimised interference contour, this gear spindle enables the heavy-duty machining of complex 5-axis components. In addition to its equipment and performance, DMG MORI has also improved the efficiency of the DMU 210 U thus reducing energy costs and making a significant contribution to environmental friendliness.

Thanks to its diverse optional equipment, the DMU 210 P 2nd Generation is optimally equipped for manufacturing large deep-drawing moulds, bearing blocks and integral components

DMU 90 P duoBLOCK
Heavy-duty machining with an attractive package price

5-axis machining of the highest level is also the trademark of the fourth generation of the successful duoBLOCK series. Outstanding features here include the highly stable design of the universal machines, long-term accuracy and highest precision with up to 4 µm positioning accuracy even in the standard version. With its DMU 90 P duoBLOCK DMG MORI now presents a machining centre that will continue the triumphal march of the series. This latest model is designed as a package machine with a 430-Nm and 52-kW motor spindle, space for 60 SK50 tools plus an IKZ coolant unit and guarantees an economical entry into heavy-duty machining.



The DMU 90 P duoBLOCK allows an economical entry into heavy-duty machining

Applications in tool and mould making as well as in general mechanical engineering call for investment in reliable, high-performance production equipment. DMG MORI has included the attractively priced DMU 90 P duoBLOCK in its range with universal machining in mind. With an X-axis travel path of 900 mm and a workpiece weight of 1,800 kg, it outperforms the smaller DMU 80 P duoBLOCK. Where its technical equipment is concerned, DMG MORI has concentrated on heavy-duty machining and offers the DMU 90 P duoBLOCK as an appropriately equipped package machine.

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New Haas CNC products at AMB

Haas Automation will use the upcoming AMB 2016 exhibition in Stuttgart to present an 'advance sight' of a new Y-axis CNC turning centre, as well as a prototype of a newly developed compact mill for micro-machining and two new CNC rotary tables.

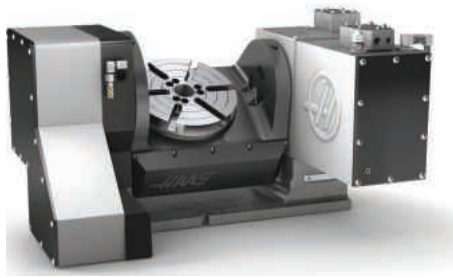
On **Stand C11** in **Hall 9**, Haas Automation will showcase its new ST-15Y big bore, small footprint CNC turning centre. The ST-15Y provides 102 mm of Y-axis travel (±51 mm from the centerline) for off-centre milling, drilling and tapping, and comes as standard with 6000 rpm high-torque live tooling and a full C-axis for versatile 4-axis capability. The machine, which will be available in Europe in Q4, offers 63.5 mm bar capacity and a maximum cutting capacity of 356 x 406 mm, with a swing of 406 mm over the cross slide.

With industry witnessing a marked trend for micro-machining applications, Haas will also shine the spotlight on a prototype of its new CM-1 compact mill, which is designed as a high-accuracy solution for high-volume production and prototyping of small, high-precision 2D and 3D parts such as those found in the communications, medical and dental industries. Small enough to fit into most freight elevators, the CM-1 features 300 x 254 x 300 mm travels, a 508 x 254 mm T-slot table, a 30,000 rpm ISO20 taper spindle and a 20-pocket automatic tool changer. Maximum cutting feeds are 12.7 m/min, with rapids to 19.2 m/min for reduced cycle times.

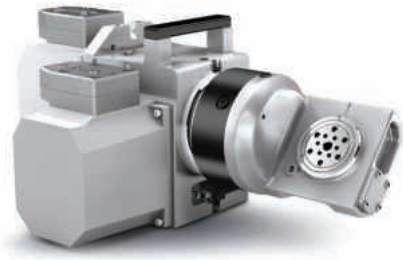
The CM-1 at AMB 2016 will be fitted with the new Haas TRT70 ultra-compact, dual-axis tilting/rotary table that provides ±120° of tilt and 360° of rotation to position parts to almost any angle for 5-axis machining. The TRT70 provides 81.3 Nm of torque on the tilt axis and 54.2 Nm on the rotary axis for aggressive machining. Furthermore, indexing speeds of 410 deg/sec on the tilt axis and 620 deg/sec on the rotary axis ensure short cycle times. The precision-ground 70 mm platter features multiple bolt patterns and a precision through-bore for versatile fixturing, and will swing parts up to 102 mm diameter. A separate TRT70 will also be displayed in the rotaries section of the stand.

Another new rotary on display at AMB will be the Haas TR200Y, a dual-axis trunnion rotary table that puts five-axis capabilities well within reach of the average job shop. The TR200Y is designed to mount in the Y direction (front to back on the table) of a mid-size VMC. At less than 686 mm wide and only 508 mm deep, the TR200Y easily fits on one end of the machine's table, leaving the remaining space free for additional fixtures or vices. The TR200Y has a 200 mm T-slot platter, and will swing parts up to 206 mm diameter.

There will be two TR200Y units on display, one as a separate unit and another fitted to a Haas VM-2 Vertical Mould Making machine. This will be joined at the show by a cross-section of CNC machines from the existing Haas portfolio, including a UMC-750SS Super Speed 5-axis universal machining centre, a VF-2SS Super Speed vertical machining centre, a VF-3YT/50 vertical machining centre with 50-taper spindle, a VM-2 Vertical Mould Making machine, and a DM-2 drill/mill centre.



All new Haas vertical machining centres (including the CM-1) come with the Haas Next Generation Control (NGC): a fast, smart, smooth and aesthetically pleasing control that offers class-leading ease of use. Customers who invest in a new Haas vertical machining centre get simple, highly intuitive navigation, more memory to store more programs, DWO (Dynamic Work Offset) and TCPC (Tool Center Point Control) to simplify 4- and 5-axis machining, a new VPS (Visual Programming System) to generate G-code programs and optional Wi-Fi capability for more convenience. Easy, mobile machine monitoring is another option available in the near future.



For AMB visitors seeking machines capable of performing high quality, cost-effective CNC turning operations, an ST-35 lathe and an ST-20SSY Super Speed CNC lathe with Y-axis will be on display, the latter will feature a Haas bar feeder.

Visitors are invited to bring along their components or drawings to AMB 2016 for a discussion with the friendly team of Haas experts about the optimum machining solutions available.

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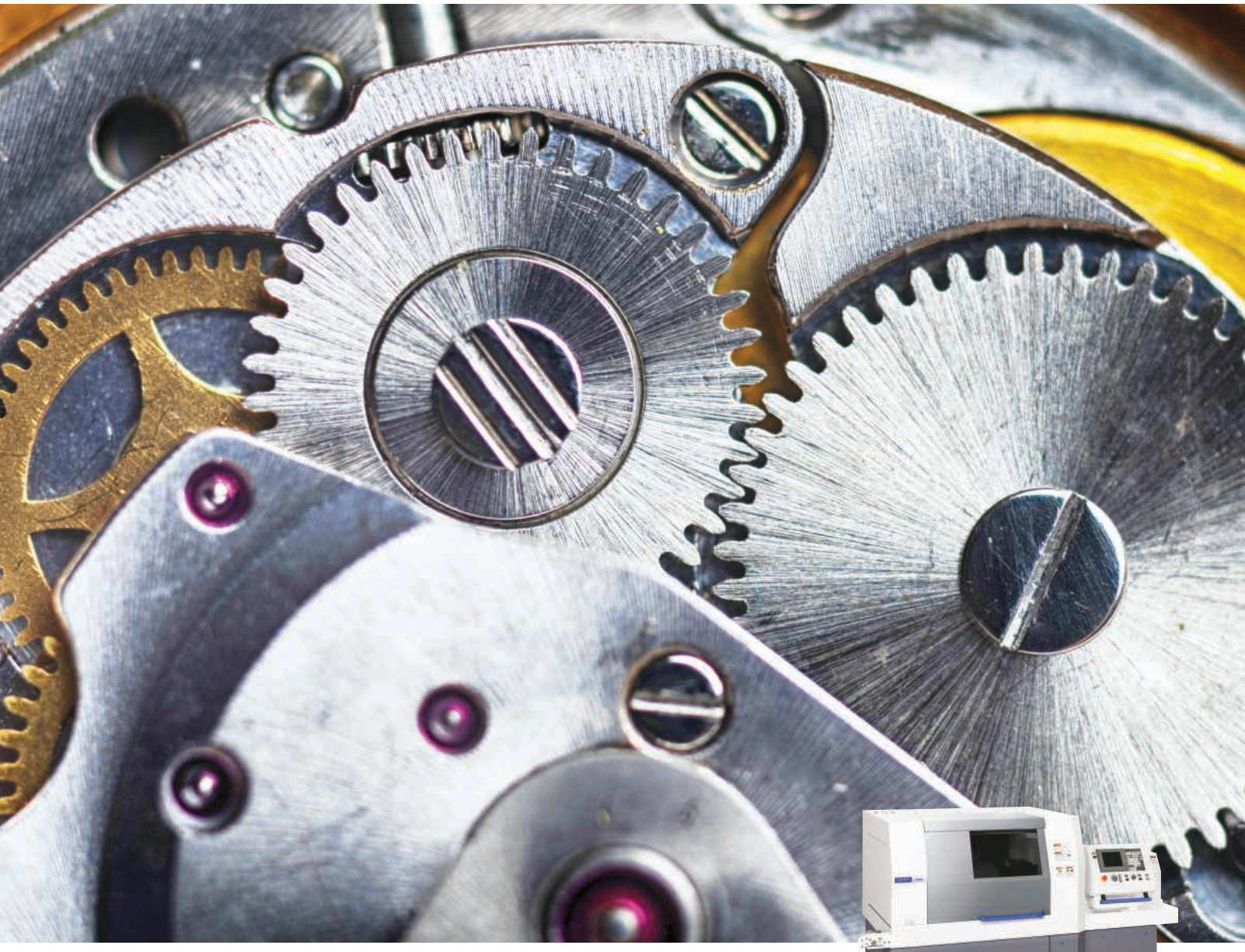


Join us at our Open House event and see **LIVE DEMONSTRATIONS** on the latest Citizen Cincom CNC sliding head and Miyano fixed head turning centres. The event will showcase new models plus launch ground breaking new **LFV** technology. Don't miss the opportunity to secure your **'early bird' deal** with trade-in on your existing machines and attractive finance packages to fund your investment.

It's time for **LOW FREQUENCY VIBRATION** technology – come and see this **COST-SAVING** solution in action. Fitted on-to our very latest L20 machine – the benefits of LFV are: increased chip control, increased tool life and reduced/remove the need for high pressure coolant.

With special show offers, a free 2-course lunch and the opportunity to see **12 CITIZEN CNC MACHINES**, the Citizen Open House 2016 is an event not to be missed.

Register today to book your free place at **www.citizenmachinery.co.uk**

Citizen – Open House Event

11 – 13 October 2016

Cincom Miyano

EMAG expands its modular product range

The success story of EMAG's modular machines continues at AMB. The modular machine concept was introduced by EMAG in 2011 and has turned into a favorite within the market. Starting with a focus on the development of vertical turning machines, in recent years, we have witnessed the integration of the EMAG Group's full technology portfolio into this new machine model. Now, in addition to vertical pick-up turning centres for chucked and shaft parts, there are also machines for gear cutting, induction hardening, and hard machining. Combined with the TrackMotion automation solution, EMAG now offers these modular machines as building-blocks for entire production lines. EMAG will be introducing two new modular standard machines to the EMAG product line this year at AMB in **Hall 3 Stand D32**.

The modular machines are already optimised for maximum productivity due to the fully automatic manufacturing system which includes EMAG's "pick-up" technology, self-loading working spindle and integrated parts storage unit. In addition, there is a work turret with 12 tool positions, fully designed and manufactured by EMAG and considered one of the best on the market. When combined with the machine base made out of Mineralit® polymer concrete, the result is an extremely compact machine tool that ensures top quality results and maximum productivity. If these impressive features aren't enough for you, EMAG is now introducing the new VL 3 DUO, a dual-spindle machine that is redefining productivity.

Compact, fast, precise

With its range of parts up to 150 mm (5.9 in) in diameter, the VL 3 DUO is ideal for functions in transmission component manufacturing, for instance in the machining of blanks for gear production.

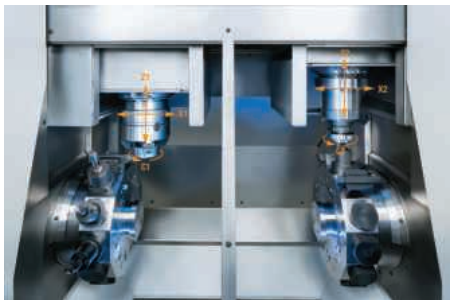
This is where the VL 3 DUO scores highly, especially with its short chip-to-chip times of about 5 seconds, depending on the workpiece geometry. It reduces idle times to a minimum and guarantees maximum productivity. The new dual-spindle machine also impresses with its machining capability. It features two 18 kW main spindles offering up to 142 Nm torque. The offer is complemented by options including driven turret tools and measuring stations located

The VL 3 DUO is the most compact high-performance manufacturing system for chucked components. Shown above in combination with the parts storage unit and the TrackMotion automation system

outside the machining area. The extremely robust machine design with recirculating roller guides offers an optimal basis for great surface finishes and minimal tool wear, and a direct measuring system that ensures a high degree of precision in all axes.

A modular solution for the machining of gears

The VL 3 DUO forms part of the Modular Solutions which distinguishes itself through its modular design. This design makes the configuration of complex manufacturing systems simple. The VL 3 DUO is easy to integrate, as shown in the machining of gears, for example. The soft machining process of a gear covers 4 operations: turning OP 10 and OP 20, hobbing OP 30 and chamfering and deburring OP 40. "With the VL 3 DUO we are aiming, of course, at the first two operations, i.e. OP 10 and OP 20, in particular.



The two work areas of the VL 3 DUO are each equipped with a 12-position tool turret

Vertical hard machining of transmission components

While the VL 3 DUO provides maximum productivity for the soft machining of blanks for transmission components, the new VLC 200 GT guarantees cost reductions in the hard machining of planetary gear carriers.

The VLC 200 GT allows for the use of a variety of technologies for hard machining on a single machine, such as hard turning and grinding. Flexibility was a top priority with the VLC 200 GT, and consequently the machine's work area can be setup perfectly to suit each component being machined. The user can rest assured that the best technology for machining the workpiece will be available every time, whether that is a turning turret or a block tool holder for hard turning or grinding spindles for external and internal machining. This means processes

The VLC 200 GT allows the use of a variety of technologies for the hard machining of gears

are optimised. For example, the bore of a gearwheel can be finish-ground with a CBN wheel, while the end faces are hard turned. In both cases optimal surface finishes and the most advantageous cycle times are guaranteed. The machining quality is monitored by a measuring probe located between the machining area and loading station. In short, the VLC 200 GT brings not only cost reductions on all levels but also optimal machining results – a win-win situation for the user.

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Mazak takes 12 machines to AMB

Yamazaki Mazak is taking 12 machines to AMB 2016 in Stuttgart, exhibiting the full breath of its machine range and new SMOOTH Technology, the world's fastest CNC.

The Mazak stand, is themed 'It's all about you,' in recognition of the company's continued focus on developing machines which solve specific machining challenges faced by its customers. The Mazak stand will showcase horizontal and vertical machining centres, 5-axis machines, turning centres, a new machine from its entry-level range and, for the first time at a German show, all three variants of the company's new SMOOTH Technology, namely SmoothX, SmoothG and SmoothC control.

The highlight of the show is likely to be the new INTEGREX i-400 AM, a revolutionary hybrid machine which combines additive manufacturing with multi-tasking capability. The i-400 AM integrates Direct Energy Deposition additive manufacturing technology into a 5-axis multi-tasking machine to offer machine users unrivalled hybrid technology and subtractive manufacturing in one platform.

The INTEGREX i-400 AM makes use of a built-in 1 kW fibre laser to melt metallic powder, which is then applied layer-by-layer via interchangeable cladding heads. The heads are stored in the machine's standard 36-tool magazine and enable the automatic change from additive to subtractive tooling, optimising process cycle time.

The INTEGREX i-400 AM technology can be used to clad a range of material types, including stainless steel, nickel alloys and copper, making it ideal for a range of applications, from repairing existing worn or damaged components or the complete generation of new parts. The machine is equipped with SmoothX control, the 5-axis version of Mazak's new SMOOTH Technology, which enables the machine to efficiently process prismatic, round and highly contoured workpieces, as well as those near net features which have been created using the integrated additive technology.

The HCN 5000/50 is a new 50 taper machine with a 500 mm square pallet boasting extremely agile performance characteristics, including a 10,000 rpm/ 37 kW high performance spindle; rapid traverse rates of 60 m/min in the X, Y and Z axes and a chip-to-chip change time of only 3.5 seconds

Horizontal machining centres will be represented by the HCN 5000/50, a new 50 taper machine with a 500 mm square pallet boasting extremely agile performance characteristics, including a 10,000 rpm/ 37 kW high performance spindle, rapid traverse rates of 60 m/min in the X-, Y- and Z-axes and a chip-to-chip change time of only 3.5 seconds. The 50 taper spindle provides a highly rigid interface for mounting large tools, up to 320 mm dia., enabling a high productivity solution for machining a range of components for automotive, agriculture, construction and the cutting of cast materials.

The machine has the smallest machine footprint in its class, with a floorspace-saving design and overall machine dimensions which measure only 2,544 mm x 5,830 mm. Importantly, the space-saving design has been achieved without compromising its machining performance and ability to handle large workpieces, with the HCN 5000/50 able to bear components up to dia. 800 mm x 1,000 mm in height. HCN 5000/50 is also available in a single pallet and A-axis table configuration with integrated hydraulic services, proving a well-designed solution for complex fixturing. The machine on display at AMB 2016 is equipped with the new SmoothG CNC and an 80 tool hive.

Also on the stand will be the VTC-800/30SLR, a new addition to the hugely successful European-designed and manufactured VTC800 vertical travelling column machine series, which is available in both 40 and 50 taper versions. The

The INTEGREX i-400 AM combines additive manufacturing technology with Multi-tasking capability, and will be one of the stand-out machines on Mazak's stand at AMB 2016

800/30SLR incorporates a 1,000 mm diameter rotary table capable of carrying a 2,200 kg load, which makes it ideal for machining large components, along with a centre partition that enables the setup and machining of a different component on the right side of the normal table.

The specific machine at AMB 2016 is equipped with a Siemens SINUMERIK 840D sl control for those machine users that have standardised on Siemens control in their operations. The SINUMERIK package includes CNC, Mazak spindle with fully integrated Siemens motor and SINUMERIK drives and servo motors.

Mazak will also exhibit its MULTIPLEX 6200-II Y turning centre, which is ideally suited to high volume applications, such as those in the automotive sector. The MULTIPLEX combines two NC turning centres with milling capacity and is capable of performing continuous and simultaneous machining by both spindles, including automatic workpiece transfer from one spindle to the other. The machine is equipped with a 5,000 rpm main spindle and is capable of rapid traverse rate of 30,000 m/min in the X-axis and 33,000 mm/min in the Z-axis.

The VTC 800/30SLR incorporates a 1,000 mm diameter rotary table in the left side of the table, capable of carrying a 2,200 kg load, which makes it ideal for machining large components

Entry-level machines remain a vitally important part of the Mazak range and the company will showcase the new QT COMPACT. The COMPACT is a high specification, entry-level model boasting Mazak's integrated spindle technology for the main spindle and Tool Eye as standard - which together offer both improved performance and accuracy. The QT COMPACT comes equipped with a Mazak manufactured driven tool turret and an eight-inch chuck. It is capable of a maximum speed of 5,000 rpm and a peak torque of 167 Nm. The machine is equipped with SmoothC control, incorporating state-of-the-art motion control technology.

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Yamawa Europe chooses AMB to launch European operations

Yamawa Europe, the European subsidiary of Yamawa, a leading Japanese manufacturer of high performance threading tools, has selected AMB Exhibition in Stuttgart as its first important direct presence since the official start of operations in Europe. Officially in operation since January 2016, Yamawa Europe has recently introduced its new Products Catalogue 2016-2017 dedicated to the European market and will showcase at AMB a series of new products focused on the technology needs of the German industry.

Significant highlights are the MHRZ forming taps, for forming threads of medium hardness steel and specifically designed for the automotive industry, the MHSL series for medium hardness steel high performance tapping of blind holes, AXE-HT taps for high performance tapping of aluminum alloy die casting and MC-AD-CT carbide taps with through coolant for high volume tapping of blind holes in aluminum diecasting.

"The technology excellence of the Yamawa product range meets perfectly the philosophy and the requirements of the German metal working industry," says Alessandro Sorgato, CEO of Yamawa Europe. "With the opportunity represented by an important and well established exhibition such as AMB, we'll be involved in a series of meetings that we have set up to select new qualified partners for the German market and to meet directly with end-users who need the tools to meet their challenges everyday".

Yamawa will also present the new AU DIN range of universal taps now available up to 20 diameter for both M and MF threads, allowing high performance threading on a broad range of materials, to meet one of the most frequent requirement of the market.

The breadth of Yamawa range will be visually represented at the stand with the showing of the S0.6 roll tap for micro-threading side by side with the new RE-HT tap for off-shore maintenance of large dimension workpieces available at the show in size M80. Together with one of the most comprehensive catalogues in the industry with 15,000 items and a detailed and rich section dedicated to technical information, Yamawa Europe will introduce for the first time the new technical guides, building on the know-how developedit has developed over almost a century of experience in the design and manufacturing of taps, dies and centring tools.

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AMB Stand E2-201

Time to get on board

Steed Webzell reviews the latest technologies helping subcontractors to thrive in the buoyant global aerospace industry

The global aerospace and defence industry is expected to witness an increase in total sector revenues of three percent during 2016, at least according to Deloitte Global's latest sector outlook. Defence budgets in the US, UK, France, Japan and several Middle Eastern countries are increasing at a time when national security threats are being heightened. Furthermore, the commercial aerospace sector is expected to continue its decade-long trend of above-average growth rates, driven by increasing passenger travel demand and accelerated asset replacement cycles.

All this bodes well for aerospace supply chain subcontractors, many of which have been busy in recent months investing in the latest manufacturing technologies. Altec, for example, has invested heavily in new 5-axis machine tool technology for its Durham facility. The first 5-axis machine to arrive was a Mazak VCT800/30SR machining centre, which was followed three months ago by a Mazak Variaxis i-700 trunnion style simultaneous 5-axis machining centre featuring the latest Smooth X control system. Now, at the recent Farnborough Air Show, the company announced a repeat order for another 5-axis Mazak VTC800/30SR.

The specification for this latest machine, which is due for delivery by the end of September, is in line with Altec's other 5-axis systems, which manufacture a range of aerospace components in aluminium and titanium.

"The multi-axis capability we have developed at our Durham facility ranges in size from large bed machines to multi-pallet systems with in-process probing," explains business development director Paul Lackenby.

"Importantly, our large bed machines incorporate high pressure coolant for high speed machining, which allows us to perform deep-hole machining in-house."

Of course, one of the major aspects of supplying parts for the aerospace industry is size. With this in mind, Kansas, US-based Triumph Structures Wichita, a subcontractor specialising in aluminium and titanium structural airframe components with wall thicknesses down to 5 mm, had to think carefully about its next investment. The company manufactures wing spars and stringers but also works on smaller sections, such as bulkheads and landing gear, which demands fast, reliable and versatile machine tools. With this in mind, it decided on a bespoke machine from Zimmermann, which is represented in the UK by Geo Kingsbury.

The subcontractor asked Zimmerman to modify its FZ100 single-gantry machine to include a second gantry. Each would be equipped with an independent Siemens Sinumerik 840D sl CNC and a M3 ABC fork milling head with three rotary CNC axes to provide simultaneous 6-axis cutting using both gantries.

The machine's head is able to swivel, tilt and incline to any angle, providing constant feed rate capability, reducing machining times and improving component surface finish, as cutter chatter on the component surface due to excessive C-axis rotation is eliminated.

"Over long runs, this can translate into cycle time reductions of 35 percent or more," says Harry Thurmond, president of Triumph Structures Wichita.

In an industry notorious for its demanding aero-engine materials, most subcontractors also have to evaluate new cutting tools in an effort to reduce machining time, increase tool life or improve part quality, and sometimes all three. Stellar Precision Components, a Tier 2 aerospace supplier based in Jeanette, USA, did it for an entirely different reason. "We'd just taken an order for some Inconel parts," says production manager Edward Frieze. "None of us were really worried at that point about tool life, our only concern was how the heck we could get them shipped in eight weeks."

The raw material blanks for the job

measured 457 x 457 x 76 mm and weighed nearly 134 kg each. As a result, the problem was one of material removal: when finished, the Inconel plates weighed in at 13.6 kg, 90 percent lighter than their starting weight.

The company turned to Kennametal's series of four- and six-flute ceramic end mills. Constructed of SiAlON KYS40 grade ceramic, these end mills are designed specifically for roughing in nickel-based high temperature alloys.

"At one point, we had around $20,000 worth of end mills sitting in the office and we were starting to question the investment," says Edward Frieze, "but once you calculated in the machine costs and reduced cycle time, we figured it was three to four times more cost-effective to go this route."

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Siemens in collaboration agreement with BAE Systems

Siemens and BAE Systems, the global defence, aerospace and security company, have further strengthened a decade-long working relationship through an agreement to develop closer strategic collaboration to drive growth in skills and technology solutions, while supporting key industrial UK and regional development plans.

The two-year agreement covers the exchange of a wide range of technologies and skills across mutually beneficial areas to further improvements and efficiencies within real time engineering projects, operations and research and development. With each company operating within complex, but different sectors, the collaboration hopes to realise the benefits of combining the in-depth expertise from each business to challenge existing technology and business processes and create even stronger industry solutions.

A key scheme set to benefit from the agreement is the Innovation in Manufacturing & Engineering (IME) programme, a supply chain development initiative in partnership with Lancaster University. It focuses on driving forward leadership and innovation skills for small and medium-sized enterprises (SMEs) in the North West. The programme also provides a platform for the new North West Advanced Manufacturing Centre base at the Lancashire Enterprise Zone in Samlesbury.

Both Siemens and BAE Systems are hosting delegates as part of the scheme, involving them in specific innovation challenges and giving them experience of methods of working with their supply chains.

Siemens and BAE Systems already work in partnership as joint founding partners on the North West Catapult Centre, which is committed to supporting the development of skills and capability, as well as having a shared presence on a number of research boards, innovation councils and working groups supporting national and regional initiatives. Both companies have also made considerable investments in technology centres located around existing high technology sites with the aim of encouraging smaller businesses to grow innovation based projects, as well as

attracting larger businesses to invest to benefit from a technology-based cluster environment.

One of the practical examples of the benefits driven from the collaboration is the support offered by Siemens of the lifecycle of the 5-axis titanium machining facility at BAE Systems Samlesbury. This technology reduces production downtime, enabling BAE Systems to meet the complex requirements of the F35 program.

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ExoTec aims for the stars with Javelin

As mission-critical functionality goes, products manufactured by ExoTec Precision don't come any higher on the list. ExoTec is one of only a few companies in the world working with the rare exotic material, Beryllium, and the company's high quality optical lenses are currently deployed on a number of satellites. It also has components on their way to Mars as part of the ExoMars programme, including the Schiaparelli landing craft.

Beryllium's unique properties of being the lightest machineable metal in the periodic table, along with its exceptional stiffness and outstanding thermal conductivity make it ideal for space applications.

ExoTec's satellite-based products enable a range of functions, from Earth scanning to laser communication systems. While NASA and the European Space Agency keep track of the space vehicles containing ExoTec's products, the Somerset-based company relies on the Javelin production control system from Vero Software to ensure full material traceability on Earth.

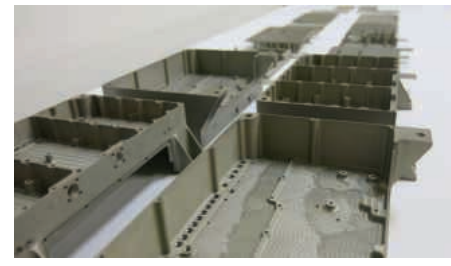
Operations manager Adrian Willoughby says that one Javelin function in particular, Materials Control, gives them the ability to trace the component right back to the original billet it was machined from:

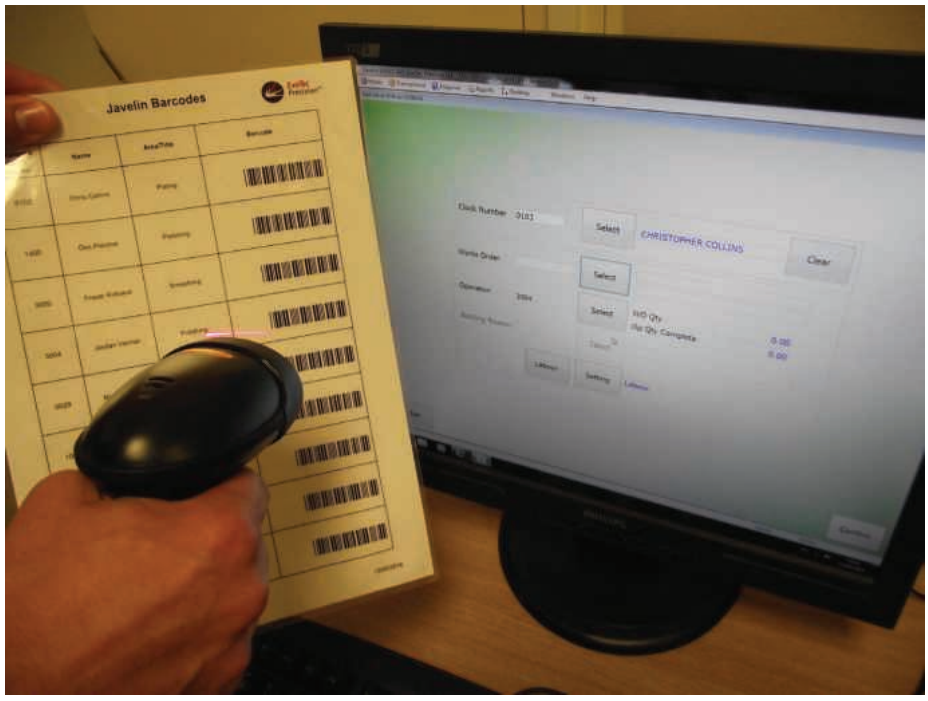
"With everything we order, we register the goods received note and record all traceability data associated with that material, so whenever we subsequently book material for a job we can maintain traceability from the original supplier, along with all their certifications. When we come to ship the finished product we can guarantee the exact origin of that material to our customers, which is particularly valuable for pure Beryllium and the other exotic and unusual metals we work with, such as AlBeMet and aluminium silicon carbide."

Having recently moved across from an old version of Javelin's predecessor, Jobshop to embrace the new and improved functionality, Javelin now provides the company with a simple, fast and efficient way of receiving orders, capturing and structuring the associated bills of materials, generating materials requirements and work instructions and then launching works orders through the shop floor. It is also of paramount importance in putting them in complete control of their complex and sophisticated manufacturing processes, giving them the full traceability demanded by the aerospace industry.

As well as their ISO 9001:2000 certification which requires full control over its processes and documentation, ExoTec is one of the first companies in the UK to be working towards ISO 9001:2015 accreditations and Adrian Willoughby says Javelin is playing a huge role in ensuring a successful audit at the end of 2016:

"A key part of ISO 9001 is saying what we do and then doing what we say, and Javelin gives us the structure in our processes to demonstrate full traceability and conformity to meet the standard."





While relying on a number of Javelin's powerful functions, he says it is particularly flexible in how its MRP aspect is used in conjunction with the Kanban system ExoTec operates: "Normally Kanban and MRP would be diametrically opposed approaches, but we still need Javelin's MRP to give us a long-term forecast, while Kanban pulls the product through the line."

Two of the most important items of functionality for the company are Works Orders and Shop Floor Data Capture. With the WO function forming Javelin's core element, it controls the progress of work through the manufacturing facility. A full set of monitoring and tracking routines ensures complete visibility of all Work In Progress. ExoTec also operates what Adrian Willoughby calls a "separate sideline system," producing work instruction sheets: "We then bring the two together, which tells the shop floor exactly what they need to manufacture."

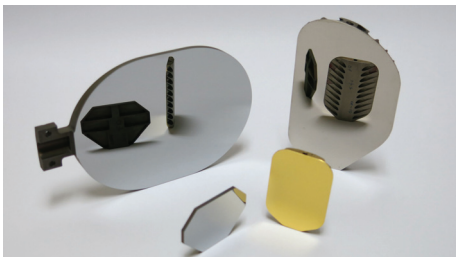
Javelin controls all the production processes, which include milling, turning, drilling, wire EDM, lapping, plating,

polishing and vacuum coating. Depending on the individual products, the end-to-end process on the shop floor can have anything between 30 and 100 different operations, and ExoTec has SFDC monitors set up in seven areas of the factory to track the progress of Works Orders.

"We tend to capture at the end of each work centre to say that particular part of the job has been completed, then the work instruction moves on to the next step," adds Adrian Willoughby.

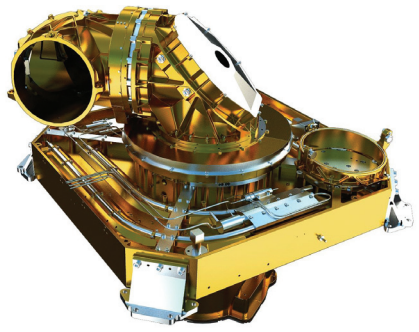
As well as the satellite products, ExoTec also produces high specification mirrors for laser beam steering, required in applications such as laser welding, additive layer manufacturing, and equipment where lasers are used for cutting cardboard boxes and labels. Its products even steer the lasers used in laser light shows, and while each component has to be absolutely perfect for those Earth-bound applications, ultra-precision and absolute integrity of parts used on spacecraft cannot be emphasised enough.

"In terms of mission-critical functionality, if our product doesn't work it would mean the satellite doesn't work and the mission would fail. Javelin ensures we can guarantee



the absolute integrity of the material we use and helps us get our processes right first time every time, so we can be sure every component has gone through all the correct manufacturing operations," concludes Adrian Willoughby.

Headquartered in England, Vero Software designs, develops, and supplies CAD/CAM/CAE software radically enhancing the efficiency of design and manufacturing processes, providing its customers with exceptional value through high productivity gains and significantly reducing time to market. The company's world-renowned brands include Alphacam, Cabinet Vision, Edgecam, Machining STRATEGIST, PEPS, Radan, SMIRT, SURFCAM, WorkNC and VISI, along with the production control MRP system Javelin. Despite the diversity of application, these



solutions have one thing in common: they all address the rising challenges of achieving manufacturing efficiencies and bring huge value to the operations in which they are deployed.

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

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AML wins plaudits from Rolls-Royce for blisk manufacture

Siemens NX Turbomachinery module optimises CNC programming for AML's most complex ever project

AML is a manufacturing solution provider with a portfolio of industry leading customers, among them Rolls-Royce, the Boeing Company, Goodrich, Bombardier and Siemens, along with many of their prime and secondary suppliers. The company, a spin-out from the University of Sheffield's Advanced Manufacturing Research Centre (AMRC), is a subcontract manufacturer of complex parts machined from exotic materials such as titanium, super alloys etc., and sub-assemblies for the aerospace, oil and gas, nuclear, power generation and industrial sectors.

Strategic relationships with key industry leaders have allowed AML to build a best in class production environment.

The company's development capability is being maintained through ongoing links with the AMRC and with the support of specialist CAD/CAM supplier, TTL, Siemens Industry Software's chosen specialist CAM partner.

This has enabled AML to operate at the forefront of machining mill/turn technology and has boosted its reputation as leader and natural supply chain partner in the machining of complex 5-axis hard metal components, in the most demanding of industries.

In recent years, TTL has provided the company with Siemens NX CAM software, as well as on-going training and support. TTL possesses more than 150 man years of combined experience in CNC programming, multi-axis machining and is uniquely placed to provide the expert services required to maximise the return on AML's NX CAM investment.

Blisk project

As a Tier 2 Member of the AMRC, AML's relationship with the Process Technology Group has provided significant exposure to the benefits of the NX Turbomachinery module. The company had previously invested heavily in NX CAM software suites, so when AML was successful in bidding to supply Rolls-Royce with two 1.2 metre diameter blisks for the Advance3 aero engine programme, TTL recommended NX Turbomachinery to help optimise part programming and machining.

AML had previously manufactured single blade components, but had not completed anything with the complexity of this multi bladed component, as Bob Leach, project engineer, explains: "We have previously faced some challenges with blisk type items, difficult to generate geometries, difficult to generate toolpaths, as a blisk is a complex item."

TTL set up a demonstration of the module's programming capability and eas-of-use, helping the company assess the major gains that NX Turbomachinery would deliver to the project, notably a potential 50 percent reduction in programming lead times and an ability to automatically generate complex 5-axis toolpaths. A cost-benefit analysis identified a rapid payback over the lifetime of the contract through the cost savings associated with quicker, more accurate programming and machining.

Following the demonstration and analysis, TTL introduced the module across the company's design and engineering operations.

"We've been successfully using Siemens NX Turbomachinery on Rolls-Royce blisk components for the past two years," continues Bob Leach. "Working with TTL has been really good and they've been incredibly supportive with all the training they've offered us so far."

Benefits to AML

Had AML not invested in the module, the company's engineering department would have had to manually generate toolpaths for the blisk, resulting in much higher internal costs and timescales.

"Without the NX Turbomachinery module, we'd be using variable contour and other conventional NX strategies to achieve a blade which takes significantly more time and effort to generate the toolpaths. With NX Turbomachinery, you can literally pick the surfaces and go, which has enabled us to deliver the blisk on time and within the parameters specified by Rolls-Royce." explains Bob Leach.

Key success factors

The project has been an outstanding success for AML and the NX CAM suite supplied by TTL.The blisk, engineered and manufactured by AML, won plaudits for its quality from Rolls-Royce.

Gareth Morgan, managing director of AML comments: "We simply would not have been able to complete this project without the NX Turbomachinery module and the initial support of TTL. We wouldn't look anywhere elsewhere for this type of support."

With this level of achievement, AML believes the experience will stand it in good stead for projects requiring similar programming and machining capabilities in other sectors such as power generation and marine markets.

"This module extends our capability into the machining of highly complex components and has the potential to open up new markets to us. For multi-blade manufacture, NX Turbomachinery is a very powerful programming tool," concludes Gareth Morgan.

TTL has been one of the leading industry names for CAD/CAM and CNC machining since 1987. As part of the global Starraggroup and a dedicated Siemens UK specialist CAM partner, we provide turnkey software solutions with an emphasis on manufacturing for international businesses in the aerospace, power generation, marine, motorsport, and medical sectors.

Certified to ISO 9001 standards, TTL takes a human approach when providing technology which integrates into your existing business processes to ensure you get the most out of your investment.

TTL understands the issues of your business and tailor solutions accordingly, with comprehensive aftersales support. It is this approach, together with our range of experience and knowledge which helped the company to win the prestigious Queen's Award for Enterprise in the Innovation category for our Adaptive Machining technology. Innovation remains at the core of everything TTL offers today for its customers, delivering highly efficient advanced software-based machining solutions, and first-class customer care.

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Advances in machining airframe and engine parts

NCMT, the sales and service agent in the UK for Makino machine tools, presented four distinct areas of production for the aerospace industry at the recent Farnborough International Airshow.

Titanium machining

Very high metal removal rate is a hallmark of Makino T-series machining centres, which are typically able to hog up to 500 cm^3 of Ti-6Al-4V per minute. Despite having such impressive roughing performance, the machines are also capable of 5-axis simultaneous finishing to very high precision.

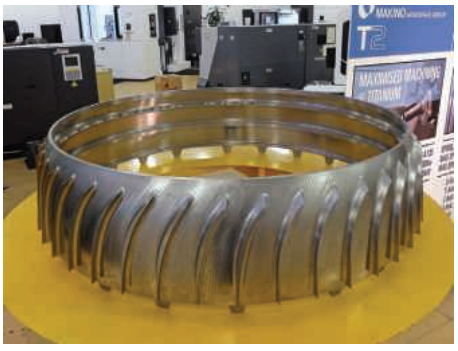
A significant technological advance is the use of three rotary CNC axes, a ±110 degree A-axis and a 360 degree C-axis on the spindle head, plus 360 degrees of continuous movement of the B-axis table. The user is able to choose A/C mode and position B for machining airframe parts, for example, or can select A/B for efficiently machining engine casings and other circular components. In either case, the sixth CNC axis can be repeatedly repositioned during a machining cycle.

Aluminium machining

Makino offers its MAG series of 5-axis, horizontal machining centres for producing large aircraft structural components but at the smaller end of the scale, the a51nx, a61nx and a81nx models offer raised productivity, accuracy and reliability.

The 40-taper machines feature improved casting designs as well as enhancements to the spindle and guideways. They impart rigidity, precision, lower vibration and longer tool life normally associated with 50-taper HMCs, while maintaining high speed machining capability. An HSK-A63 interface is optional.

The latest a81nx features 900 mm by 900 mm by 1,020 mm axis travels. The magazine, which includes a tool loading



station, can accommodate up to 299 cutters, chip to chip time being 3.7 seconds for a 12 kg tool. Two spindle designs provide high productivity; 10,000 rpm is standard, while the optional 37 kW / 8,000 rpm, high-torque spindle boosts continuous power levels for tough cutting applications.

VIPER grinding

For producing aero engine parts from nickel alloys and for milling components in other difficult-to-machine metals, VIPER (very impressive performance extreme removal) creep-feed grinding is capable of stock removal rates up to eight times those achievable when conventionally grinding nickel alloys using a plated CBN wheel.

Broaching, milling and turning operations can also be eliminated using the VIPER superabrasive process. In all cases, consumable costs are reduced dramatically. Makino NCMT Grinding Division offers this technology across continental Europe and Scandinavia in addition to the UK and Ireland.

Noteworthy is the design of the programmable coolant nozzles, which are repositioned during grinding by two rotary NC axes anywhere through 360 degrees around the periphery of the grinding wheel. Nozzle movement is fast and responsive when changing orientation to ensure that coolant continues to be accurately directed towards the point of cutting at all times.

The most recent development from Makino is the 7-axis i-Grinder G7, which, like other VIPER machines, is based on a machining centre platform. It allows grinding wheels and other metalcutting tools to be exchanged automatically between the tool magazine and the spindle, allowing a variety of machining operations to be carried out in the same cycle.

The smaller Makino i-Grinder G5 accepts parts nominally up to 300 mm diameter, but with increasing aircraft engine size, some larger vanes were falling outside the machine's working envelope. The 730 mm by 650 mm by 730 mm capacity of the G7 addresses the problem. Increased space in the machining area also allows room to house two roll stacks to dress the grinding wheels, allowing flexibility to produce a greater variety of components without having to change the rolls.

EDM drilling

Makino's EDBV (electrical discharge blades and vanes) series of electric discharge machining (EDM) centres for hole drilling have been specifically designed for the production of cooling holes and diffuser shapes in aerospace blades and vane segments.

The EDBV3 provides aerospace manufacturers with the speed, flexibility and reliability to effectively produce a wide range of shapes and sizes in a single set-up, significantly reducing the variety of tools required and overall cycle times. More recently, the EDBV8 has been introduced to deliver top performance and optimal speed when machining larger, heavier workpieces.

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Deep-draw press to support cutting-edge turbine engine programs

Quintus Technologies has delivered a hydroform deep-draw press to Electro-Methods, Inc. (EMI), the South Windsor, Connecticut-based supplier of turbine engine components.
In the face of robust demand from the jet engine industry, the new 4,000 tonne press-force press will expand EMI capabilities, further enabling the production of intricate shaped sheet metal parts and assemblies.

Along with excellent forming capabilities, the Quintus press requires only a single rigid tool half, significantly reducing tool costs. The other half of the tool is a flexible rubber diaphragm under uniform hydrostatic pressure. Material draw ratios of up to 3:1 eliminate several forming operations, intermediate heat treatments, and operator dependencies. The high forming pressure ensures close-tolerance parts direct from the press, with little or no secondary hand work required.

"Electro-Methods has received many awards for its diverse capabilities, which enable the manufacture of the most complex fabrications and assemblies,

including flight-safety-critical turbine engine components," says Jan Söderström, CEO of Quintus Technologies in Sweden. "The new family of deep-drawing fluid cell presses that Quintus has developed over recent years is specifically aimed at the versatility requirements within the jet engine industry, making this press a good fit for EMI."
Quintus Technologies specialises in the design, manufacture, installation, and support of high-pressure systems for sheet metal forming and densification of advanced materials and critical industrial components.

Headquartered in Västerås, Sweden, and represented in 35 countries worldwide, the company is the world leader in high-pressure technology and has delivered more than 1,800 systems to customers across the globe within industries such as aerospace, automotive, energy, and medical implants.

Ed Williams, Quintus general manager Americas, adds: "EMI's choice of the 11,600 psi deep-draw press will support the demand for fabrication of low-weight and very tough metal alloys, required by jet engine designers seeking fabrication solutions for fuel-efficient aircrafts.

Quintus Technologies specialises in the design, manufacture, installation, and support of high-pressure systems for sheet metal forming and densification of advanced materials and critical industrial components.

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Dassault Systèmes and Airbus Group extend collaboration to additive manufacturing

Dassault Systèmes has announced that Airbus Group, after a two-year comprehensive benchmarking process, is extending its use of Dassault Systèmes' 3DEXPERIENCE platform to its additive manufacturing programs integrating design, simulation and production.

Airbus Group will deploy Dassault Systèmes' collaborative design and simulation applications as part of the "Co-Design to Target" industry solution experience, for the additive manufacturing of tooling, prototyping and parts for test flights and for production use on commercial aircraft. This provides Airbus Group with digital continuity to optimise its conceptual designs by virtually validating each phase of the additive manufacturing process. Leveraging Dassault Systèmes' applications and its own leadership and engineering expertise in additive manufacturing, Airbus Group can explore greater design and manufacturing possibilities to meet engineering and manufacturing requirements for the additive manufacturing of tools and parts.

Additive manufacturing, also known as 3D

printing, is an alternative to production processes such as milling, melting, casting and precision forging. Already adopted by the aerospace industry for creative product design and prototyping, the use of additive manufacturing is gradually extending to large-scale production. The "Co-Design to Target" industry solution experience leverages applications for additive manufacturing to offer high flexibility in part design, production and testing. This helps reduce waste and costs associated with the manufacturing of complex aircraft parts, without sacrificing strength or performance.

"Numerous projects across Airbus are accelerating the use of additive manufacturing to produce prototypes as well as production components potentially delivering lighter and less expensive parts that meet technological, performance, safety and cost standards," says Robert Nardini, senior vice president Engineering Airframe, Airbus. "Airbus has long used Dassault Systèmes' simulation applications to accelerate the structural analysis and virtual testing of aircraft and now we can define a new way of designing parts by leveraging simulation-based design to better answer aviation market needs."

"Additive manufacturing creates new opportunities in many different areas such as remote fabrication for support and maintenance, rapid prototyping for realizing new concepts and experiences and, perhaps most importantly, developing designs that were heretofore impossible to fabricate," says Dominique Florack, senior executive vice president, Research & Development, Dassault Systèmes. "With this approach, Airbus Group will be able to take advantage of the 3DEXPERIENCE platform's next generation automated design assistant for parts, whether they are 3D printed or not, thus accelerating a new wave of transformation in the aerospace industry."

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Citizen L32 turn-mill centres meet demands

Two of the very latest 'icon' versions of the full specification Citizen Cincom L32-VIII CNC sliding head turn-mill centres feature as part of the first of the extensive machine tool installations in the new manufacturing plant relocation plans of the Alco Valves Group.

Alco Valves Group's new, purpose designed 68,000 ft^2 flagship headquarters, which has seen an investment of $10 million on an 8.5 acre site in Brighouse, West Yorkshire, will progressively integrate three existing sites, two locally from Brighouse and one from Denton, Manchester. This is in order to centralise product design and research as well as the development, production, final assembly and test of oil and natural gas valves. Alco Valves employs 123 people and produces over 12,000 (2014 figures) instrumentation, ball and needle valves, large bore double block and bleed valves. These are exported to 23 countries for offshore, petrochemical, subsea and power generation.

Acquired by American conglomerate Graco Inc. in 2014, a leading company in fluid handling equipment, Alco Valves has become a key part of Graco's oil and gas division. The decision to purchase the Citizen machines against competitor sliding head machines involved not only a team from the UK but also engineers from America. Together, they jointly performed in-depth investigations of the technology and the potential capability to meet future production requirements.

Major advantages also cited in the justification and decision for the Citizen machine installations were factors such as reliability plus ease-of-use and high levels of flexibility for processing the company's type of work. Once the joint decision was made, the US team also placed orders for identical machines to perform similar turn-milling requirements for parts up to 32 mm diameter.

UK manufacturing engineering manager Tom Stonier says: "We work very closely with our engineers in America and freely exchange information on all aspects of machine tools, tooling, software and advancement in production technology. We compare notes, correspond and even meet on a frequent basis. Because there are no predominate attitudes, this means exchange of information becomes advantageous to us all in our decision making and therefore benefits the company."

The two Citizen machines, which were installed in a cell in late February, are being progressively tooled for producing valve bodies, inserts, end connectors, stems and seals using materials including 316 stainless steel, duplex and PEEK. Cycle times at the moment vary between 30 seconds for seats to five minutes for valve bodies.

Tom Stonier says: "This was our first venture into sliding head technology as these parts up to 32 mm diameter were previously made on subcontract. This means our focus has been on building our own very cost-efficient programs that will reduce our lead times. Our policy now is to make 80 percent in-house using our developed methods, which will give us greater control of quality and stock levels while maintaining the security of an external supplier for the balance of our needs."

In making the move to adopt sliding head technology, he explained how an application engineer was involved and existing setting staff were given the opportunity to retrain. A new setter with experience was also recruited from outside the company. They all attended in-depth training courses at Citizen Machinery's headquarters in Bushey and, with the inclusion of Citizen's Wizard programming software, Tom Stonier says: "This played an important factor in building up confidence, helped by the machine's ability to be very easy to use."

Tom Stonier describes how the acceptance trials of both machines were carried out without a hitch and all the run-off criteria was easily exceeded. This included a 30 component unmanned run where no deviation from the set size was acceptable. Currently the machines are running two shifts, but this will be extended in due course to three and there is a longer term plan to order a further two Citizen machines. Then, one man on each shift will be responsible for the complete cell.

Initially, with the setters and the application engineer running as a dedicated team, a full changeover is taking about three hours but this is seen as being significantly reduced in the future as they implement optimised bar sizing, for instance. Also as

part of forward planning, they are involved in upgrading the MRP system and pre-existing department data is being cleansed.

The 7-axis Citizen Cincom L32-VIII has a 7.5 kW main spindle and 3.7 kW sub-spindle each delivering up to 8,000 revs/min. Up to 30 tools can be carried with six driven tools capable of 6,000 revs/min. The machine has the added flexibility of a swivelling B-axis and a cross feed Y-axis on its back tool post. Rapid traverse rates are fast at 32 m/min.

The Alco Valves machines have an IEMCA bar feed and outfeed component conveyor, Citizen's Coolblaster CB50 high pressure coolant system and Absolute filtration. An external coolant tank is included with integrated swarf conveyor that has an air curtain

under the conveyor outlet to prevent any small swarf particles being carried back along the load length of the conveyor. Both machines are linked into a wireless network that will cover all machine tools in the facility.

In production were ½ inch ball valves produced from 316 stainless steel in a single cycle time of 2.31 minutes. Altogether 13 tools were set with three on the front tool post and 10 on the back tool post to maintain tolerances of 0.02 mm on certain key dimensions.

The part was initially faced, turned to 28 mm diameter, the central bore drilled and bored to 17 mm diameter and the front end threaded ¾ 20 UNF. The bore was then counterbored and chamfered. A cross hole for the valve lever operation was drilled 7 mm diameter through and counterbored to 11 mm to +/- 0.05 mm on both diameter and depth and, using a special tool, back counterbored to 11 mm diameter and the same tolerance.

A further hole was drilled and flat bottomed to 3 mm diameter by 3 mm deep in the OD before a double radius form was milled in the outside diameter to create clearance for the operating handle. It was then parted-off 36 mm long and transferred to the sub-spindle.

Here, the parted face was turned and the bore threaded, counterbored and chamfered the same as the first operation, and the part number and identification engraved on the outside diameter.

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Tycam knows what it likes and likes what it knows

St Neots-based Tycam Engineering (originally Astral Engineering) has built a solid business supplying machined parts for aerospace and military power supply units. In its early days it was a two-man business utilising manual machines and the skills it had available. Now, over 25 years later, it remains a two-man business, but its production methods have changed significantly through utilisation of machining centre technology from XYZ Machine Tools.

Current owner of Tycam Engineering Andy Tyler, who bought the business from his former employer in early 2000, has transformed the company through investment in four XYZ ProtoTRAK LPM machining systems along with an XYZ 2-OP portable vertical machining centre:

"Back in the early days a lot of the components we worked on comprised of fabrications, so manual machining was probably the way to go. However, as our key customer Ipeco Electronics developed their products we had to review how we machined them. This meant looking at CNC, which my boss at the time had little interest in. After a demonstration of the XYZ ProtoTRAK system, I managed to convince him to have one retrofitted to an old turret mill we had."

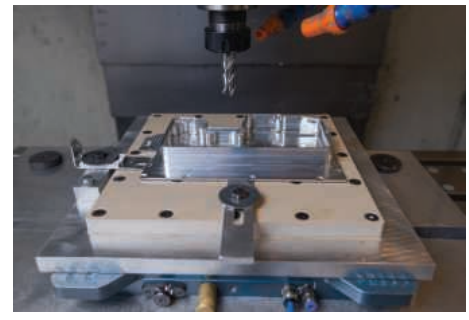
This early experience of ProtoTRAK helped to change the direction of the business and over the years additional CNC machines were added, including an XYZ MiniMill 560, and a couple of XYZ bed mills. The XYZ MiniMill 560 was bought for a specific job, which ran for four years. When that job finished Tycam decided to look at larger machine capacity and purchased an XYZ ProtoTRAK bed mill, as its remaining work still tended to be low volume, but demanding of CNC capability.

Andy Tyler continues: "We were very happy with the ProtoTRAK bed mill, but when one complex job turned into a production part, we knew we needed to upgrade to a machine with toolchanging capabilities, but I didn't want the trouble of learning G-code and a new control system." The solution lay in the XYZ LPM (Lean Production Machine).

Using the same ProtoTRAK control the XYZ LPM is a 3-axis vertical machining centre with a 16 position tool magazine, that is quick and easy to setup thanks to the use of ProtoTRAK, tool setting system, and the Jergens ball lock system used for locating vices and fixtures to the table. The latter ensures that the control knows the exact coordinates of any fixturing information. This is then stored in the control for use any time a particular setup is required. The big advantage for Andy Tyler and Tycam, though, was the ability to simply transfer the program from his bed mill to the LPM, with the only adjustment being to add in the tool changes.

Andy Tyler adds: "This first LPM was a revelation and I am now hooked on them, the ease of use and versatility has made a major difference to how we produce parts, already having the experience of ProtoTRAK made the transition straightforward and I have total confidence in the machines capability, which makes quoting for new work simple."

The four XYZ LPM machines are operated by just two people, Andy Tyler and his apprentice, Jordan Parish, who joined the company in December. With no



programming or production machining experience Jordan quickly got to grips with ProtoTRAK and, after a relatively short period of time, he is now happy to set and program parts on the LPM machines. At Tycam the four XYZ LPMs are set up slightly differently, with a combination of vices and vacuum plates adding to the LPM's versatility and suiting the work being undertaken.

The four XYZ LPM machines at Tycam have been complemented with the addition of an XYZ 2-OP portable vertical machining centre. Designed to be able to be relocated around the factory, where it is needed, when it is needed, to take pre-op or second operation work off more expensive machines, Tycam also saw its value as a stand-alone vertical machining centre. It was seeing increasing demand for batches of between 50 and 60-off of smaller components, which it didn't want to tie up an LPM with.

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Starrag UK extends Heckert HEC 400 cell

Starrag UK has supplied another Heckert horizontal HEC 400D machining centre to the same customer, the 14th machine on-site to expand a manufacturing cell dedicated to a range of suspension components, where the HEC machines are enabling the customer to benefit from reduced machining times and improved integrity of production.

The UK-based top-tier supplier is using the HECs to successfully machine a variety of steel and aluminium components, capitalising on the machines' power, precision, productivity and cost-effectiveness.

These 4-axis machines are being used throughout the automotive sector, by OEMs and their top-tier suppliers, for the single setup machining of workpieces such as gearboxes, coupling housings and valve bodies, and they are proving especially effective when used as manufacturing cells/flexible manufacturing systems.

The 500 mm by 400 mm pallet HEC 400D can be supplied in a variety of modes to suit specific needs. For machining light alloys, cast metals and steels, with rapid traverse rates of 60 m/min, and spindle speeds of 10,000 revs/min (optionally 20,000) Starrag's Dynamic package has traverse rates up to 100 m/min and 15,000 revs/min spindle (optionally 20, 000 or 24,000 revs/min) and the Power package is for heavy-duty cutting with 37 kW main spindle/350 Nm torque plus 60 m/min traverse rates.

The HEC 400D's impressive traversing rates are courtesy of powerful AC feed drives in all linear axes. This is complemented by highly accurate profile rail guideways on all axes to guarantee a consistently high degree of positioning.

The machine's high-level performance is underpinned by Heckert's renowned compact thermo-symmetric machine design techniques, which results in a machine that exhibits excellent damping and very low heat expansion.

Another design highlight is the machine's ability to efficiently remove large amounts of chips, via a wider than usual chip conveyor, to minimise the likelihood of swarf build-up and heat problems, thus creating an ideal

environment for dry machining. The result is a machine that, impressively, proves Starrag's claim of 'Engineering precisely what you value' as is illustrated by the extended production cell for the suspension components.

The Heckert HEC range extends to HEC 500 machines with pallets of 500 mm by 630 mm and includes the 5-axis HEC 500D U5 model with NC swivel head.

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A proud history and an even brighter future

Cambridge Precision Ltd (CPL), a leading precision subcontract specialist based in St. Neots, Cambridgeshire, is celebrating its 40th anniversary this year.

The company, committed to innovation and continuous improvement across all aspects of its business operations, and armed with a bold brand positioning statement that guarantees "Excellence every time" manufactures high-precision, complex parts for a growing and increasingly diverse domestic and international customer base.

This base includes many blue-chip companies from the aerospace & defence, scientific laboratory, X-Ray, security, medical, research instrumentation, audio-visual and thermo-imagery market sectors and industries.

Whilst CPL's range of clients, the type of work undertaken and the technology it has at its disposal have all dramatically changed over the last 40 years, some things have remained constant. Most notably, the company's commitment to technical excellence, lead time fulfilment and cost-competitiveness as well as developing and maintaining long-term, mutually-beneficial partnerships with customers and suppliers alike.

One beneficiary of CPL's loyalty and business approach is Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland who shares many of CPL's values and who, since the early 1980's, has supplied over 26 machine tools to the company. The most recent of these is a new large-capacity Doosan DNM 650 II vertical machining centre, equipped with a 4th-/5th-axis unit, due for installation at the company's facility at the end of June 2016.

The early days

In 1976 Cambridge Precision, then known as Craychase Ltd., was established by directors Mike Hobbs and Roger Whiteley.

In these early days, operating out of an ex-RAF 'Prefab' hut in the Great Gransden area of Cambridgeshire, the fledgling company, armed with a surface grinder and an assortment of manual machines began trading by making parts for local instrumentation and hydraulic equipment customers.

Despite relatively humble beginnings, Mike Hobbs was not content to let the company 'just tick along', and in the early 1980's the company invested in its first CNC machine supplied by Mills CNC, or to put it more accurately, by Mills Marketing Services Ltd.

Mike Hobbs says: "We approached Mills about investing in a Okuma & Howa 5VA vertical machining centre as a route to increasing and improving our manufacturing capacity and capabilities. We had recently moved to larger premises and had taken on more staff and the time was right to invest in the latest machine tool technologies.

"The machine was expensive (£78 k), and in truth I was nervous about making the investment. We had researched the market to find out which machine tool companies delivered the best service and support, as well as which supplied high quality, reliable machines. Mills, even then, was widely regarded and respected in the industry for its service and support, and Okuma & Howa technology was considered state-of-the-art.

"We attended a meeting with Peter Mills who arranged to get the machine installed at our facility, and for us to trial it for three months, free-of-charge. He also provided details of a competitive finance deal we could take advantage of if we decided to purchase the machine after the three month trial period had ended."

Even though neither party would have recognised it at the time this was to be the start of a long and enduring partnership between both companies.

In 1991 niche subcontract specialist, Cambridge Precision Instruments Ltd was created by Mike Hobbs' son, Richard, and co-founder, Nigel Rata.

This company operated independently, building its own profile, reputation and a strong customer base until 2003, when it merged with Craychase Ltd., to create a new entity Cambridge Precision Ltd with Richard Hobbs at the helm.

During this period of expansion and growth, CPL maintained its relationships with Mills CNC which itself had undergone a number of transformations from Mills Marketing Services to Mills Manufacturing Technologies and, most recently to Mills CNC.

To stay ahead of the game and to ensure it has a competitive advantage, the company regularly reviews and benchmarks its performance making adjustments and changes to its operations to exploit new and emerging opportunities as they arise.

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High productivity twin pallet VMC from Quaser

A Quaser MK 603 SE twin pallet vertical machining centre now available from the Engineering Technology Group is claimed by its manufacturer to offer the highest productivity available from a machine with such a small footprint.

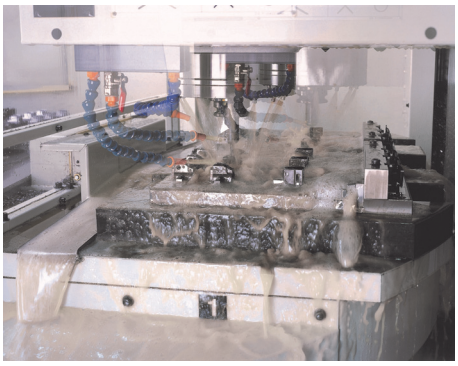
The 603 SE is a third generation development of the well proven 603 series of VMC's with over 700 machines sold and in service worldwide.

It features a moving column design based on three axes mounted on a rigid machine base which provides less geometric error with different weights of workpiece. The machine features heavy duty roller linear ways and ball screws, the latter being pre-tensioned. It stands on a footprint of 3.7 m wide x 4.8 deep with a height of 3.3 m.

The twin pallet machining trunnions have a 300 kg load capacity per side with the automatic pallet change time of just 8 seconds. By reducing the (APC) speed, this can be increased to 500 kg for larger workpieces. Pallet change repeatability is maintained at 0.008 mm.

Machining capacity and cutting data are also impressive. Axes travels are 1,020 mm on the X, 610 mm on Y and 610 mm on Z. Each pallet measures 1,050 x 550 mm and the maximum workpiece height is 350 mm.

Pallet rigidity contributes greatly to sustained accuracy and the 603 SE's feature highly secure curvic couplings. There is also a central aperture of 80 mm diameter which accommodates services for a 4th axis table should this be required.



The machine's random ATC system has a capacity of 48 tools (upgradeable) with a tool-to-tool time of 2.5 seconds and a chip-to-chip of six seconds.

The belt driven 40 taper, 70 mmø spindle (as standard) runs up to 9,000 rpm with 187 Nm of torque. The spindle is up-gradeable to 12,000 or 15,000 rpm and the machine is supplied with a BIG PLUS face and taper tooling package offering simultaneous taper and flange contact.

With the option of the Quaser mill I or a Fanuc 31iB control, the machine is supplied with a 20 bar coolant system (with a 50 bar upgrade and chiller option) and a large capacity swarf management system to complement the high capacity machining capabilities of the VMC.

Steve Brown, ETG's business development manager, explains: "For manufacturers' looking to optimise both floor space and the productivity gains achievable with a twin pallet machine, this Quaser 603 SE represents remarkable value. It is a high precision, high volume production machine reflecting Quaser's growing reputation as a quality machine builder and would be perfectly at home in any manufacturing environment. It is also particularly suited to incorporation into turnkey engineering solutions."

Finally, aware of the operator, Quaser has considered the ergonomic aspects of the loading and operating process offering side door loading at a convenient height, large door openings and an easy accessed control panel.

The machine is also highly suited to automated loading equipment such as the Halter 'Load Assistant' which ETG can supply as part of the original specification or can retro-install.

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Unbeatable EDM productivity

Represented in the UK and Eire by sole agent, Warwick Machine Tools, ONA, a leading large and customised EDM machine tool manufacturer, has launched its new range of ONA QX range of die sink machines. As the principal new product for 2016, these machines increase productivity, surface quality and EDM machining precision to hitherto unseen levels.

Developed and manufactured at ONA's extensive facilities in Spain, the QX range of machines include a new 100 percent digital generator that provides great benefits to users of this technology. Especially significant is the increase in productivity in finishing operations where an average 60 percent improvement is achieved both with copper and graphite electrodes, as well as major improvement in the homogeneity of the roughness on large surfaces. In the mould sector, where the machining of deep and narrow grooves with very difficult cleaning conditions is common, there has been an increase in productivity of up to 50 percent for this type of work, without any increase in electrode wear.

The increase in productivity of QX machines is linked to a significant reduction in electrode wear, which can last up to five times longer depending on the type of application. This advantage allows significant cost savings and simplifies the performance of many jobs where previously it was necessary to use two electrodes now one is often sufficient. This significant reduction in electrode wear enables QX machines to create cavities with a high aspect ratio, as well as to substantially improve the precision in micro-cavities, ensuring the generation of up to 5 microns in the inner radius of corners, compared to the 15 microns of previous machine designs.

The new all-digital generator offers unprecedented flexibility to adapt the technology to the special and specific applications of each customer. The generator has been developed with the specific requirements for quality demanded by customers in the aerospace sector, in which advanced materials of exceptional hardness, such as nickel- and titanium-based alloys, are used. An equivalent to a lapped finish, a surface roughness of just 0.08 µm Ra can be achieved by the new generator.

The EDM process plays a significant role in the manufacture of the mould tools for these demanding components. EDM micro-machining operations have gaps of less than 0.05 mm, corner radii below 10 microns and achieve a surface finish of 0.1 to 0.25 µm Ra. A vital part of successful micro-machining is the control and resolution of the charge intensity.

At low intensities, of less than 4 A, if the intensity is dependent on the input voltage and discharge it becomes very difficult to ensure that the programmed current is achieved at the electrode. The digital QX generator has intensity scaling of 0.1 A that allows each discharge to be finely controlled to meet the programmed parameters.

The new family of ONA QX die sinking

EDM machines was officially launched at the recent BIEMH exhibition, held in Bilbao, Spain in June. The ONA QX4 model that features travels of 600 x 400 x 400 mm in X, Y and Z, as well as the large model QX8 Modular were demonstrated on the company's stand. QX Modular machines have a modular and versatile design that allows each customer to configure the machine to their exact specification, choosing from 40 different standard configurations.

The largest model in the QX Modular series is the QX10 machine, which features axis travels of 3,000 x 1,500 x 1,000 mm in X, Y and Z respectively and permits the loading of workpieces up to 25 tonnes. The smallest model, the QX7 machine, has axis travels of 1,500 mm in X, 750 mm in Y and 650 mm in Z and accepts loads of up to 15 tonnes on the worktable. All machines in the series can also be fitted with two heads controlled by separate CNCs, making it possible to independently machine two cavities at the same time on a large workpiece.

Finally, it is noteworthy that the ONA QX range of machines features a powerful CNC that can control up to eight axes simultaneously.

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Contamac and Star: award winning precision in optical materials

Contamac, a UK manufacturer of materials for contact lenses, has recently won its second Queen's Award. Having scooped the first award in 2012 for International Trade, the company has this year proudly achieved a second win, this time for Innovation.

The materials are initially produced as cylindrical acrylic bars and machined down into much smaller discs, which are then exported worldwide and used to produce prescription contact lenses and intraocular lenses used in cataract operations. Boasting an impressive combination of top scientific knowledge, best-in-class sliding head technology, a scratch-built secondary production line and the dedication of its workforce, Contamac has honed its processes into a well-oiled production machine.

A stellar global reputation and uncompromising approach identifies Contamac as a business with a pedigree worthy of recognition.

Production manager Chris Boulton explains how they were able to achieve such effective processes: "While we've always created the raw materials on-site, our older production methods involved traditional manual machinery and were quite labour-intensive and time-consuming. We approached Star GB to see if they could help. They showed us new techniques and introduced us to machinery perfect for machining the part in question.

"We soon found we could roll these techniques out over a vast range of our products. From the one product we needed to machine, we found that Star machines could help us out in many other areas. By working closely with Star, we've come to a place where we can produce a vast range of products which we never had the opportunity to produce beforehand. It was a steep learning curve but worth every step."

Star Micronics GB, that has just opened a new purpose-built facility in Derby, has assisted hundreds of UK manufacturers in streamlining their processes and improving productivity. As a leading innovator in sliding head lathe technology, Star GB has helped push the boundaries of what can be achieved in turned parts manufacturing, regardless of material type and industry sector.

Contamac has now acquired three Star GB SR-20JN machines and two SR-32JN's, which allows their production department to run 24 hours a day with minimal staffing, yet still achieve outstanding productivity levels. Together with a secondary production line, which consists of an array of homemade miniature turning machines, the facility can now produce a staggering 430,000 pieces per month.

While sliding head lathes are primarily used to machine ferrous and non-ferrous materials, Contamac operates exclusively on acrylics, meaning a standard machining cell would have been of no use. Star GB was able to engineer a bespoke setup for its specific needs, replacing the standard coolant manifolds with an integrated air blast system and providing a shorter bar feed to accommodate the unusual material, which can only be manufactured in lengths of 400 mm.

With production running at an all-time high and two prestigious awards under its belt, Chris Boulton is confident that the company's partnership with Star GB will continue to bear fruit in the future:

"We've worked together with Star for a long time and produced very good quality products with outstanding repeatability. They've supported us so well throughout this project and we've benefited extremely well from them.

"Everyone at Contamac is extremely proud of the awards we've won and I would have to say Star GB helped us in that achievement. Let's hope we can keep this situation going."

To announce the opening of its stunning new site, Star GB will be holding a three-day Open House event running from the 5th to the 7th of October. Aside from taking in the scale of the ultra-modern facility, located next to a prestigious Rolls-Royce factory, visitors will get a first look at the brand new SR-32JII sliding head lathe, scheduled for release in 2017. This event will be supported by partner companies demonstrating an array of ancillary products together with a range of established Star machines including the SR-38B, SB-12RG, SR-20RIV Type B, and SW-12RII.

For more information or to book your place at the Open House, contact:

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Email: sales@stargb.com
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A gentle gripper for Cobots

At the recent Automatica exhibition in Munich, SCHUNK presented the world premiere of its new SCHUNK JL1 Co-act gripper. This new generation of cutting edge grippers has been specially designed for collaboration between humans and robots.

This gentle powerhouse from the competence leader for clamping technology and gripping systems was awarded the first JL1 prize, as the most innovative new product in the handling and gripping category of the coveted MM Awards. The SCHUNK JL1 Co-act Gripper is the world's very first collaborative gripper capable of directly interacting and communicating with humans. Its most distinguishing features are its flexible outer skin with curved edges, integrated protection against workpiece loss and also an LED panel used as an interface for communication with humans.

Even at a basic level, the SCHUNK JL1 Co-act gripper satisfies the most critical requirements of safe human/robot collaboration. It never loses grip of an object, it always detects contact with humans and it will never cause injury when gripping. A safe drive provides for both a wide gripping force range and functional safety. If a process is interrupted, such as in the case of an emergency stop, the part is ensured to remain in a reliable grip. With the help of an environment sensor, the gripper continuously detects factors in its environment and processes the data using integrated software. If it comes into unwanted contact with humans, it automatically limits its gripping force. With the help of specially designed gripping techniques and force-measuring jaws in its fingers, the SCHUNK JL1 Co-act gripper adjusts its behaviour in real time depending on whether it is gripping a workpiece or a human hand. It is based on the DIN EN ISO 10218 safety requirements for industrial robots. It has also factored in the future DIN EN ISO 20218 safety requirements for industrial robots.

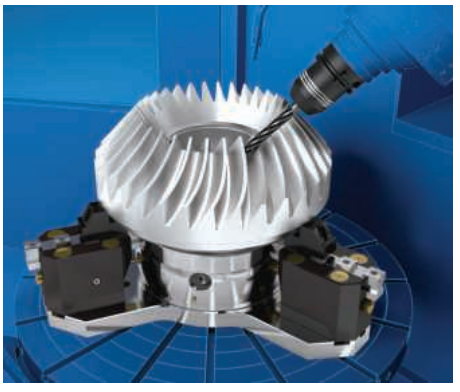
Gripper turned communication tool

SCHUNK has also designed the gripper to be used as a communication tool between the system control and the operator. LED lights and a colour coding system communicate whether the automated system is ready for operation and whether it has gripped the correct workpiece. But plans far exceed these features. In the future, the SCHUNK Co-act gripper will enable complex relationships between various sensors and safety mechanisms. Force-measuring jaws and visual monitoring will be incorporated, as will skins made of tactile and capacitive sensors or current-based force control. As with humans, who generally combine multiple senses in order to evaluate a situation, the SCHUNK Co-act gripper will be capable of collecting information from several sensor sources, allowing it to determine the most accurate possible picture of reality. OPC UA interfaces will enable the collaborative SCHUNK gripper to communicate both with robots and with the higher ranking plant control.

SCHUNK to demo new products at Northern Manufacturing 2016

At the forthcoming Northern Manufacturing exhibition on Stand F2, SCHUNK will be showing a multitude of new products alongside some of its established market favourites. At the Manchester show, the innovator in workholding, toolholding and automation will be unveiling a host of new technology for customers that didn't get to MACH 2016.

SCHUNK will be drawing customer's attention to the impressive TENDO E Compact hydraulic expansion toolholder. Capable of reducing setup times by up to 60 percent whilst generating 2,000 Nm of torque, the TENDO E Compact delivers micron precision for a host of machining



applications. With this precision toolholder, even demanding applications with tight tolerances on the form, position and surface finish can be rapidly and reliably machined.

For workholding applications, SCHUNK will demonstrate a number of products that will include the flexible manual ROTA-S chuck with its optimised wedge bar drive system and improved lubricant system that ensures consistently high clamping forces. The ROTA-S chuck ensures higher rotational speeds and cutting speeds are possible and it gives users the opportunity to utilise more efficient cutting strategies that shorten the manufacturing time.

For show visitors interested in robotics and gripping applications, SCHUNK will be showing just a few of its globally renowned gripping products. Representing the gripping range at Northern Manufacturing will be the MPG-plus miniature parallel gripper.

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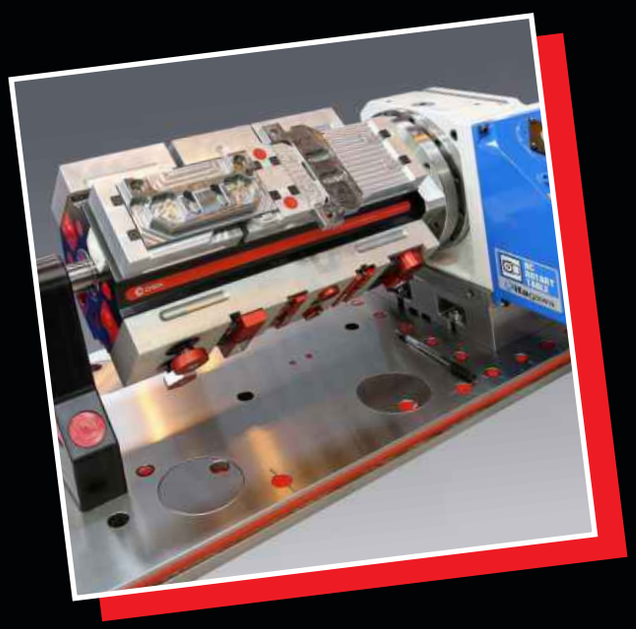
Better component workholding?

The answer's YES



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1st MTA MACHINE TOOL ACCESSORIES

Retrofit cost-effectively and safely with Roemheld

Roemheld offers a wide range of new clamping tools that enable workholding systems on deformation presses to be retrofitted simply, cost-effectively and safely. New mechanical and hydraulic clamping elements enable faster setup on virtually any press or machine. In addition, the new version of the mechanical variant is fitted with a visual clamping force display, which provides additional safety during clamping.

From higher flexibility and shorter setup times, when a great variety of tools are involved to the automation of processes or clamping with high forces and in tight spaces, virtually any intended application can be realised thanks to Roemheld's large selection of mechanical, hydraulic and electromechanical semi- and fully-automatic clamping elements.

Roemheld mechanical and hydro-mechanical clamping nuts are particularly suitable as cost-effective solutions as they can be installed quickly and simply without the need for piping. Thanks to its compact dimensions, the Roemheld hydro-mechanical clamping nut is ideal for applications where space is restricted. In addition to the visual clamping display on the mechanical clamping element, an integrated spring assembly prevents a loss of force when used with deformable components or clamping edges.

Both versions are maintenance-free and, thanks to the continuous thread, suitable for all clamping edges. Many different model variants are available with clamping forces up to 150 kN and low tightening torques of just 30 Nm.

Customers who want a higher level of automation can choose from a wide range of standard hydraulic clamping elements such as hollow piston cylinders, sliding clamps, angular clamps and wedge clamps. The use of such elements reduces clamping and release times to between just two and four seconds. In addition to these time savings and a high level of automation capabilities, Roemheld hydraulic clamping elements deliver uniform clamping at all points without applying force with the ability to monitor clamping forces. In addition, all the elements are easy to install and therefore ideal for retrofitting.

Terry O'Neill, managing director of Roemheld, says: "Our best-selling toolholding elements for retrofitting applications are hydraulic hollow piston cylinders. This is because they are quick, cost-effective, easy to retrofit and can also be used in tight spaces. They are positioned manually at the tool edge, clamp using hydraulic pressure, release by means of spring force and achieve clamping forces up to 104 kN. Locking pins secure the centrally guided T-bolt against unintentional shifting of the clamping dimension. For tools with solid, uniform clamping edges or shapes with varying clamping edge heights, different variants of hollow piston cylinder are available with and without spherical washer or with adjustable tie rod."

New compact hydraulic sliding clamp

Roemheld has introduced a range of compact, hydraulic sliding clamps designed for clamping in tight spaces on systems, press beds and rams. The new "compact" version provides the same clamping force as the "classic" sliding clamp, but both the size and the weight have been reduced. A new ergonomic design with recessed grips and rounded edges for simple insertion into the T-slots has made handling safer and installation easier. The new Roemheld compact sliding clamp is ideally suited for retrofitting without the need for standardisation of the width and depth of the dies.

The compact sliding clamp consists of a clamping block and a T-slot adapter which is used to manually position the clamp in the T-slots on the press bed or ram. Various versions are available for the DIN widths of 14, 18, 22 and 28 mm. When used on other systems, the clamping blocks can also be mounted directly without the adapter, for example onto fixed spacer bars.

Clamping takes place by applying a maximum of 400 bar to the piston, achieving clamping forces between 19.6 and 78 kN depending on the version. The piston is released by means of spring force. Depending on the element, the overall stroke is 8 or 12 mm. The anti-corrosion surface protection enables the clamp to be used in demanding conditions with temperatures up to 120°C.

Roemheld
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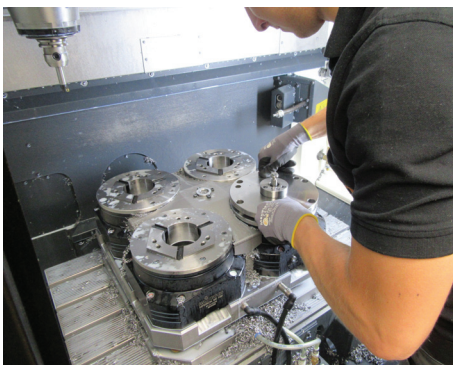
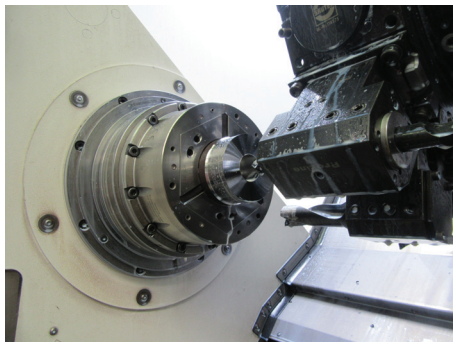
A win-win situation

Productivity is thriving at The KTR Group in Rheine thanks to new machines, shorter processes, and new workholding technology. However, just a few years ago during the periodic replacement of machines the clamping devices used by the company came into question. The main requirements were for significant improvements in setup times and in the manufacturing process for handling chips and contamination. Some cases had negative effects on the appearance of the workpieces.

EMO 2013 was soon to take place in Hannover which was important in order to get an overview of the market and the possibilities. At this point in time there had not yet been any contact with Hainbuch as a manufacturer of the clamping devices. However, at the exhibition, it quickly became clear that the right solutions could be found from Hainbuch. In the meantime, KTR and Hainbuch had become close partners and had successfully optimised manufacturing step-by-step. The Hainbuch clamping devices had completely satisfied the customers' requirements as well as offering additional advantages.

The family-run business with high-level research and development competence, which specialises in couplings, brakes, coolers, and hydraulic components for industrial applications, imposes the most rigorous requirements on itself and on its suppliers. The most rigorous requirements particularly apply for the core business, couplings with diameters from 10 mm to 2 m. Close tolerances and outstanding concentricity properties are demanded. Matthias Telker, director of production management at KTR is responsible for process optimisation at all manufacturing locations:





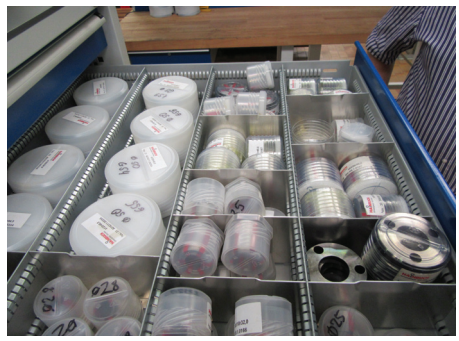
''To obtain the maximum, to deliver permanent quality of premium products, as well as being successful internationally, constant improvements in all areas are unavoidable.''

KTR supplies companies around the world in a number of industries such as railway and transport, agricultural and construction machines, machine tools and automation and wind power. It is increasingly supplying companies in the areas of marine engineering, smelting and foundry technology.

In 2013 there were extensive upheavals in manufacturing. The stipulations were to reduce idle and setup times in production in order to further optimise throughput time. Consequently, Günter Schleyer, production manager at KTR, was intensively involved with this topic. His colleague, production manager Franz-Josef Reder, was assigned to deal with the new clamping system. In his research Reder then encountered the clamping devices from Hainbuch. The visit to the Hainbuch exhibition booth at EMO followed.

Early in 2014 KTR received the Torok manual chuck with a base plate, a clamping head, and a mandrel for the trial phase. For Matthias Telker the overall time savings were extremely important. How does the system perform in the daily routine? Is it rigid, and can it meet our practical requirements? Can we organise our setup more efficiently with it? Needless to say, the implementation of the Torok manual chuck on one of the milling machines of the production line passed the test with flying colors. As a result of these findings the decision was made to work together with Hainbuch.

KTR ordered a clamping pallet with four Hydrok SE hydraulic stationary chucks in the hexagon version along with clamping heads and mandrels for the new machining center



announced in 2015 from Hainbuch. Gunter Schleyer explains: ''The Hainbuch system is custom-tailored for our products, particularly the flexibility of the clamping heads and mandrels. We do indeed use the clamping heads very intensively; however, we always have special components for which we use their mandrels. At the same time, right from the start we have also planned to use the Hainbuch clamping system for the turning machines that we ordered in 2015. Therefore we use the TOPlus mini chuck. We have a consistent system, whether for turning or milling. Now we are able to change within the modular system and therefore we are much more flexible.''

Thanks to the new turning machines in relation with the new clamping tools, some coupling series can be completely manufactured in one clamping setup. Franz-Josef Reder concludes: ''The new investments in the manufacturing are opening up entirely new possibilities for us in this area. Now we can bundle different machining steps and thus reduce throughput times.''

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Magnetic clamp pays for itself in three months

In March 2016, bespoke special purpose machine manufacturer and CNC machining subcontractor, Bowyer Engineering, bought its first magnetic workholding equipment, an Italian-made component clamping system from Tecnomagnete supplied through sole UK agent, 1st Machine Tool Accessories Ltd.

The £4,000 investment paid for itself within the first 12 weeks, according to the subcontractor's production manager, John McNab. It is significantly reducing the cost of machining steel plates for vehicle exhaust welding rigs, helping the company to address the ever increasing call from its customers for savings.

Called MillTec Grip, the permanent electro-magnetic workholding arrangement for use on machining centres and milling machines uses a double circuit to generate uniform clamping force between the workpiece and the magnetic surface and at the same time between the magnetic system and the machine table. Brief application of an electrical supply is sufficient to activate and deactivate the circuit. A patented feature of the low-profile, frameless clamps is the sealed construction with a monolithic, all-metal top section into which an array of sacrificial, cylindrical pole extensions is screwed for holding down ferrous workpieces.

Andover-based Bowyer Engineering, a 35-employee company that is celebrating its 70th anniversary this year, is predominantly a supplier to the aerospace sector. It manufactures machines for manipulating and inspecting turbine blades and also mills and turns components for use in aircraft manufacture. A wide range of exotic materials is machined on an array of CNC lathes as well as on Bridgeport 3-axis vertical machining centres and a Matsuura 5-axis model, which is the latest acquisition installed in January 2015.

One of the company's other specialisms is the production of jigs for securing vehicle exhausts during automated arc welding. Until recently, the fixtures were manufactured from multi-component fabrications. They were difficult and time-consuming to mill and drill accurately due to their complexity and the need to fixture them at compound angles. Furthermore, a large variety of materials had to be stocked for their production.

So John McNab devised a new production route that moved away from machining entire fabrications to milling and drilling steel base plates individually before assembly. It was further decided to standardise on 12 mm thick bright bar, 200 mm wide and up to 4 m long, which is sawn into billets as required.

Initially, the billets were cut into pieces of different sizes to suit the individual plates. Each had to be clamped on their edges in a vice for machining, which meant repositioning them for a second operation, as it was the edges that were being milled. Production cost was consequently high and it is this method that John is contrasting with the latest, more economical production technique.

It involves clamping a single billet for profiling a nest of variously-shaped base plates by milling to depth around their profiles, followed by drilling. This presented its own difficulties, however. A conventional fixture would have created a dead zone around the periphery caused by interference with the spindle, reducing the yield. Bowyer Engineering's zero-point workholding equipment would have introduced long idle times, as it would have been necessary to attach pull studs to the underside of each billet to provide security for heavy milling.

As John McNab puts it: "Spindles turning means spindles earning." So he set about finding a quicker method of clamping the billets without compromising the ability to machine components right up to the edge.

While at a Matsuura open house in Coalville last year, where 1st MTA had a stand in the supplier village, he remembered them making a presentation on the Tecnomagnete clamping system. He took particular note, as he learnt that the equipment was new to the UK, having only recently become readily available following the appointment earlier in the year of Salisbury-based 1st MTA as sole agent.

The move by Bowyer Engineering to machining individual base plates rather than complete fabrications provided the ideal opportunity to test out the system, as a billet can be clamped on one face, leaving the remaining five free. Brief consideration was given to vacuum workholding, but the many holes in the base plates made this method unworkable.

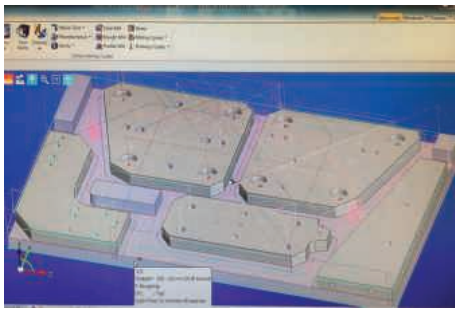
A Bridgeport XR1000 3-axis VMC with 12,000 rpm spindle, through-tool coolant

and a 30-tool magazine on the shop floor in Andover has been earmarked for the project.

The MillTec Grip magnetic clamping system has been used exclusively on this machine so far, although it could be swapped over to other machining centres on the shop floor including the 5-axis model. Thirty exhaust welding fixtures can be in build at a time, none of which is the same and each can contain up to 100 plates, so the machine is kept busy.

John McNab explains: "The magnetic workholding and nesting technique substantially reduces the cost of producing every base plate.

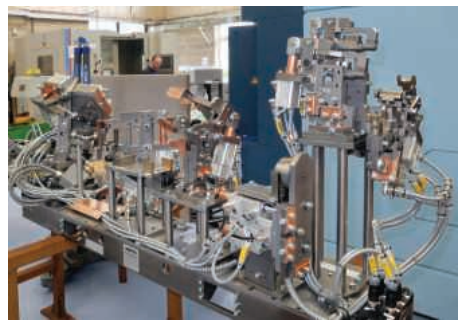
"We produce the cutter path quickly using a custom-designed template in EdgeCam that recognises recurring features. If the MillTec Grip does not happen to be on the Bridgeport, it is quick to fix it to the table by connecting an electric current, which is then switched off. Securing the steel billet onto the magnetic pole extensions is even faster and extremely secure.



"The magnetic workholding station is positioned at one end of the machine table, allowing another clamping arrangement to sit alongside it for machining other types of component, resulting in maximum versatility."

Bowyer Engineering also makes welding and other fixtures for manufacturing different products such as off-road vehicle frames and boiler housings. Its new method of making such jigs will expand business opportunities in this area. Moreover, the company is already successfully using the magnetic clamping system to streamline production of a range of subcontract parts for the aerospace, oil and gas, medical and general engineering sectors.

1st MTA provided a high level of technical back-up during initial installation of the Tecnomagnete equipment, advising how best to mount the unit on the machine and position the base plates. Support and advice from the supplier is ongoing, since Bowyer Engineering frequently encounters different workholding requirements as it transfers more and more subcontract machining onto the magnetic clamping system.



John McNab concludes: "The whole project has been a resounding success, from concept to operation. Not only have our workholding requirements been met, but the solution has exceeded all our expectations."

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Adhesive workholding allows turbine blades to be ground in one hit instead of four

Technique offers the possibility of automated production

A new method for securing a turbine blade prior to machining by gluing one side of its aerofoil to a fixture, rather than using mechanical clamping, allows the blade's root and tip to be ground in one operation.

Traditionally, due to clamp interference, four operations are required on conventional CNC grinders to machine the fir-tree and wedge face on the root as well as the shroud end features at the tip. The one-hit manufacturing process is not only faster, but also eliminates work-in-progress and the risk of introducing inaccuracy due to repeated refixturing.

The technique is being developed in the UK by NCMT, which sells Makino's VIPER grinding platforms across Europe. Since May 2015, the company has also been European agent for the patented Blue Photon photo-activated adhesive workholding system from the USA.

Developed at The Pennsylvania State University to fixture delicate and complex parts of any shape without distortion for tight-tolerance machining and inspection, it involves applying spots of adhesive between 0.5 mm and 3.0 mm thick that are cured for 30 to 60 seconds by ultraviolet light via fibre optic cables.

The machined workpiece can be easily removed by rotating the gripper inserts to shear the adhesive joint. The residual adhesive is removed with hot water or by application of another heat source, which optimally should be between 60°C and 80°C.

The fixture designed by NCMT for securing a turbine blade on one aerofoil surface using four adhesive grippers so that the root and shroud features can be VIPER-ground in a single cycle

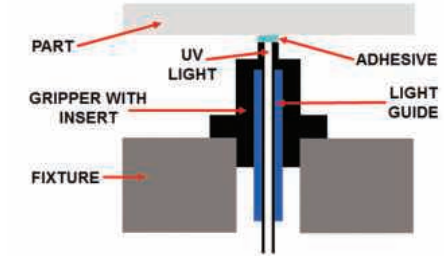
Close-up of the fixture with the test blade removed, showing the four grippers before application of Blue Photon adhesive. The UV light guides may be seen top and bottom right

NCMT's research department has exploited Blue Photon's versatility by designing a novel turbine blade fixture. It incorporates four gripper inserts that, once adhesive has been applied and cured, hold the blade securely by one side of the aerofoil. The fixture is mounted on the table of a Makino iGrinder using a zero-point clamping system to ensure a high degree of repeatability.

In tests, it was confirmed that the clamping force produced by the fixture could easily withstand the requirements of machining. The material removal rate actually exceeded that achievable when the blade was mechanically clamped, as the pressure had to be limited to avoid component distortion and loss of accuracy.

Use of the Blue Photon technique has grown rapidly in the aerospace industry in the USA. It affords excellent all-round access for machining on up to five sides and unlike magnetic clamping systems, it can be used to secure not only ferrous metals but also non-ferrous metallic parts as well as ceramics and composites. The system is ideal, for example, for clamping gamma titanium aluminide, which is being used to produce low-pressure turbine blades for the latest generation of high-efficiency jet engines. Other advantages of the clamping process are absence of workpiece distortion, good damping properties to suppress chatter, reduced cost of fixtures for holding complex parts and elimination of locating lugs on castings.

Now that the viability of one-hit turbine blade grinding has been demonstrated, NCMT is turning its attention to automating blade load / unload, including adhesive curing and its subsequent removal, to allow high volume, unattended production in aero engine and land turbine component manufacture.



Schematic showing the Blue Photon principle of adhesive workholding

Formed in 1964, NCMT operates from three strategically located sites in the North, Midlands and South of England. The company delivers high technology engineering solutions for metalcutting and grinding applications in the UK and across Europe, from stand-alone machines to complete production lines involving a high degree of automation. NCMT tends to specialise in the more demanding fields of engineering that are avoided by companies that just deliver a machine tool and little else.

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Pratt Burnerd 5-jaw chucking provides the answer for Gamet Bearings

When Gamet Bearings recently had a manufacturing headache, it automatically turned to its 600 Group sister company, Pratt Burnerd International who designs and manufactures a wide range of manual and power chucking systems at its Heckmondwike, UK factory. Pratt Burnerd not only supplies standard products, but its huge knowledge and unrivalled expertise, developed from over 150 years workholding experience, comes into its own with highly specialised chucking solutions.

Gamet has been manufacturing super precision tapered roller bearings in Colchester, Essex for 60 years, which range in size from 25 mm to over 500 mm I/D, in single and double row configurations, to radial run-out tolerances as low as 0.5 microns (0.0005 mm).

Within Gamet's range of ultra-high precision bearings, there are a number of 'Thin Section' components that are prone to distortion when being held in place by conventional 3-jaw power chucking systems.

After consulting with Alan Jenkin, product manager at Pratt Burnerd International, a new special 5-jaw, 305 mm High Speed Quick Change Gripfast chuck was developed specifically for Gamet to eradicate this problem on these components.

This 5-jaw Gripfast chuck provides a significantly greater support area than a conventional 3-jaw chuck, being designed specifically to wrap-around a component far more effectively. In addition, the design ensures the non-opposing jaws on the 5-jaw model provide a more even pressure on the manufactured components' surface area than is possible with a 3-jaw alternative.

Alan Jenkin explains "Traditionally, chuck manufacturers supplied 6 jaw chucks to handle thin walled components, which technically gives over a 20 times better 'out-of-roundness' measurement, when compared to equivalent 3-jaw chucks. Pratt Burnerd, with the 5-jaw design have further developed this idea, as by having no opposing jaws, we have significantly improved this 'out-of-roundness' measurement, over and above even the 6-jaw alternative.

This concept has been fully proven as, since the chucks installation, Gamet have

benefited from greatly reduced distortion on thin section rings up to 330 mm diameter. Tony Tankard, Gamet's manufacturing director, explains "This has improved our production efficiency significantly by reducing material allowances for subsequent operations, reducing scrap and overall manufacturing costs, which ultimately improves the overall quality of the Gamet product. Naturally, being part of the 600 Group has given us access to specific expertise that has helped us operationally."

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Brown & Holmes' deal seals orders at MACH

A special MACH only offer on Tsudakoma proved a hit with visitors to the Brown & Holmes stand at MACH 2016. Customers placing an order at the show were able to get a 40 percent discount on a Tsudakoma CNC rotary indexing table with 'plug and play' capabilities.

The new Swiss Chuck precision workholding range, which Brown & Holmes launched to the UK at the show, also attracted a great deal of interest throughout the five days of the exhibition.

A larger than ever stand also showcased the latest products from Fresmak ARNOLD high pressure vices, Mytec hydraulic expanding clamping tools and FORKARDT rotary workholding products; alongside Brown & Holmes' expertise in design and manufacture, workholding and automated solutions.

Kevin Ward, joint managing director of Brown & Holmes, says:" We had a fantastic MACH and were delighted with the number of visitors we had to the stand. We were also pleased that representatives from all of our product manufacturers were able to join us on the stand to meet customers and answer questions."

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.

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A cure for the 'chattering classes'

Chatter, the problematic vibrations often encountered when metal cutting, poses a massive headache for manufacturers throughout the world. When machining, vibration causes the workpiece to have a poor surface finish and triggers a fall-off in accuracy. Also, as well as reducing tool life, chatter increases wear on critical machine tool parts. When attempting to prevent these unwelcome effects, the engineer is obliged to use strategies such as employing expensive vibration resistant tooling devices and reducing machine tools' feeds and speeds. Invariably, these approaches lead to increased production costs in addition to reduced productivity and profitability.

Ensuring stable cutting conditions across a wide range of applications without incurring considerable production losses is a reasonable customer demand placed on tool producers. When searching for an appropriate answer, a tool manufacturer is relatively limited in the range of available design solutions. Although tool manufacturers rely on the basic design fundamentals as the foundation of successful tool developments, such as ensuring the highest possible rigidity and strength of a milling cutter and the adoption of progressive cutting geometry, the intense research and development activities of leading tool manufacturers enables continuous progress to be made in the area of combating chatter.

Through the cutting-edge work of Iscar's prolific R&D department and as a global leader in the design and production of advanced milling cutters, it has recently launched several additions to its comprehensive CHATTERFREE range.

Following market demand, and a period of development, Iscar has further expanded three of its popular ranges of solid carbide CHATTERFREE endmill families. The new endmills offer an effective solution to chatter and open-up new opportunities for the reduction of vibrations in metal cutting.

EC-E4L-CF

1 and 2 mm diameter tools have been added to the solid carbide endmill EC-E4L-CF family to further extend its small diameter application range. These tools are characterised by a four flute, 38° helix with variable pitch for roughing and finishing operations providing high material removal rates and chatterfree operations. Used for machining alloyed and stainless steel, titanium and exotic materials. The new tools are capable of up to 3XD full slot milling.

EC-E7/H7-CF

Further extending its small diameter application range, the addition of 2 to 5 mm diameter tools have been added to the EC-E7/H7-CF family. The seven flute endmills, with different helix and variable pitch, enable efficient and CHATTERFREE high speed / trochoidal milling and finishing operations.

ECA-H3-CF

1.5, 2 and 2.5 mm diameter tools, and seven tools featuring 3 mm corner radii have been added to the ECA-H3-CF family, increasing its small diameter application range. The tools with 3 mm corner radius are very popular mainly for the machining of aluminium aviation parts. These three flute solid carbide endmills with 39-41° different helix, 3, 4 and 5 x D and neck relief for machining aluminium provide excellent chatter dampening ability when used for both roughing and finishing applications.

Long and tough

Iscar recently launched solid carbide CHATTERFREE long endmills. These ECL-H7-CF, seven flute, long endmills feature a long ap (4XD) The unique patented design with different helix and variable pitch, enables CHATTERFREE high-speed trochoidal milling, semi-finish and finishing operations. The long endmills' maximum ae = 0.25 x D when machining at maximum ap, provides very stable operation without

vibrations, whilst a special tooth design enables large chip gullets for efficient chip evacuation.

Produced from IC902, an ultra-fine carbide grade and TiAlN PVD coated, the long endmills can be used for machining most material types and are able to provide excellent surface finish results and high levels of accuracy even at maximum ap.

Featuring optimal flutes and tooth geometries that deliver maximum metal removal rates and low cutting forces, ISCAR's ECL-H7-CF, seven flute, long endmills are effective across a wide range of machining speeds from 3,000 to 20,000 rpm guaranteeing high productivity.

Machining titanium?
No problem for ISCAR

To ensure that the most efficient, cost-effective cutting tools are designed and made available to the global aerospace manufacturing industry, Iscar's aerospace industry manager remains in constant communication with all of the major sub-sectors involved. Continual technical liaison allows Iscar's R&D department to remain aware of all relevant trends in areas such as material developments and machine tool advancements.

This high-level contact and cooperation has supported the development and launch of a wide range of high-quality Iscar cutting tools that have boosted the global aerospace manufacturing sector's productivity and assisted in assuring product quality across many machining disciplines.

The ever increasing use of titanium for aerospace applications results from the advantageous properties associated with

the metal. Titanium's beneficial characteristics include outstanding mechanical attributes, an exceptional strength to weight ratio, excellent corrosion and fatigue resistance and the ability to withstand moderately high temperatures without creeping.

Applications cover a wide range of airframe structural and engine parts; from massive highly stressed, forged wing structures, through landing gear components, to small critical fasteners, springs and hydraulic tubing.

The increasing complexity of titanium aerospace parts and the burgeoning demand for ever more efficient manufacturing methods has prompted the introduction of new machining technologies and the development of innovative tooling solutions, aimed at assisting users to increasing their productively.

With the objective of supporting manufacturers involved in the generation of complex shapes in titanium components, Iscar has developed a range of advanced turning, milling and hole making tools. These innovative new products are able to considerably increase efficiency when machining titanium, whilst maintaining tight tolerances.

Following the successful introduction of the ECK-H4M-CFR four flute endmills, Iscar has introduced a new ECK-H7/9-CFR solid carbide endmills family featuring a unique patented design. The new endmills are available in seven and nine flute configurations with different helix angles and variable pitch configurations. The innovative new family was specifically designed for finishing and high-speed titanium machining applications

Available with an assortment of corner radii, the new Iscar solid carbide endmill family features optimised edge preparation which prevents chipping on cutting edges and corners, rendering it perfect for the stable machining of titanium.

Suitable for a wide range of speeds, feeds and applications, the new Iscar solid carbide endmill family provides efficient chatter dampening, whilst the ranges' optimal flute and tooth geometries ensure the delivery of impressive metal removal rates.

The new high-accuracy tools are made from PVD coated grade IC900 providing longer tool life when machining titanium and are available in a diameter range from 6 to 20 mm, with each tool diameter available with either cylindrical and Weldon shanks.

The phenomena of chatter is complex in nature and has many contributing factors, therefore replicating all of these vibrations is extremely difficult. At the tool design stage, even the most authentic simulations do not always help in creating the ideal geometry of a vibration-proof milling cutter. The broad-spectrum of materials to be machined, the multiplicity of applications and massive variations in cutting conditions encountered means that it is impossible to recreate every machining condition. Therefore, when developing new CHATTERFREE products, in addition to using a range of advanced design techniques, Iscar's creative R&D department undertakes exhaustive, real-world machining trials on proposed new CHATTERFREE products. These trials are undertaken on a wide range of machine tools, when machining a multitude of materials, under a wide variety of conditions. Through the use of these thorough product development methods Iscar is able to certify the outstanding performance of the company's advanced new CHATTERFREE products.

Now in its 40th year in the UK, Iscar has successfully developed a major presence in the metalworking industry by helping customers to improve their productivity through the application of our innovative leading edge technologies and unique cutting tools.

Iscar's impressive purpose built headquarters is conveniently located in the South West outskirts of Birmingham close to the motorway network. From here, all sales and administration functions are coordinated. In the field, a team of over 50 engineers and over 200 distribution outlets provide on the spot support to customers.

Training needs are satisfied at a dedicated state-of-the-art training and seminar centre. Here, a 90 seat auditorium, 450 m^2 showroom and demonstration unit housing four CNC machines is used to provide top quality courses in the application of new cutting tool technologies. Increasing demands for specially tailored tooling are satisfied in-house by a new 800 m^2 integrated design and manufacturing centre.

Iscar Tools Ltd is registered to BS EB ISO 9001.

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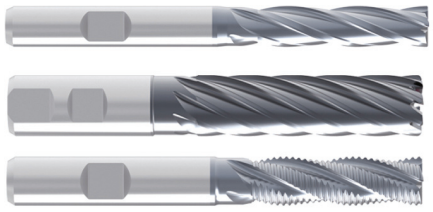
HSS milling gets a complete overhaul

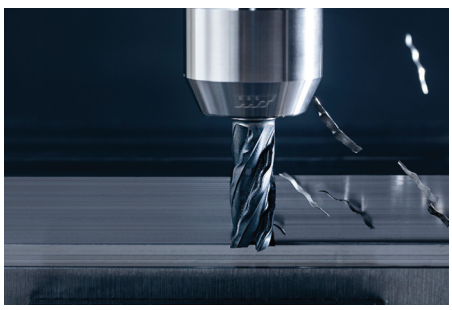
WNT has undertaken a complete review of its High Speed Steel (HSS) range of milling cutters with updates across the board and a selection of new products to enhance the already extensive range.

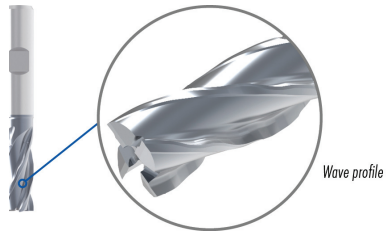


One of the key upgrades is the use of the latest Ti 100PRO tool coating across the entire WNT Mastertool selection of HSS end mills. This new coating is an evolution of the previous Ti 100XL coating and allows users of tools across the Mastertool series to benefit from reduced manufacturing costs and improved performance. In addition to the new coating, WNT has also developed four new end mill ranges to complement the existing tools in its catalogue. These are the Type N HSS-E Co 5 series, the Powdersteel Type N cutters, Powdersteel Type HR fine roughing cutters and the Powdersteel Type H cutters.

The Type N HSS-E Co 5 series features an increasing tapered core and irregular pitch flutes. The core design assists in improving tool rigidity and counteracts and reduces radial displacement under cutting conditions, while the irregular flute pitch assists with vibration reduction and improved surface finish on the component. The HSS-E Co 5 cutters are ideal for applications milling a wide range of materials including steel, cast iron, non-ferous and heat resistant alloys, with sizes ranging from 6 mm through to 28 mm diameter in both roughing and finishing variants.

The key feature of the Powdersteel Type N cutters is the wave profile along the length of the cutting edge. The effect of this





wavy profile is similar to irregular flute pitch in that it assists in reducing vibration and improves surface quality. Available between 1 mm and 28 mm diameter these Type N cutters are best suited to machining steel, stainless steel and cast iron materials. Developed for fine roughing applications the Powedersteel Type HR cutters feature serrated cutting edges to create smaller chip sizes and also benefit from the increased core taper for improved rigidity. As with all of the end mills in the WNT range they are also capable of multiple milling strategies, including shoulder, plunging, ramping and trochoidal milling.

The final new introduction are the powdersteel Type H cutters. These cutters make use of a new specially developed powdersteel material that eliminates carbon from the mix, but maximises the performance through use of cobalt, molybdenum and iron, creating a material that combines the best properties of HSS and carbide. The improved thermal stability created by this new material means that WNT's Type H cutters can run at up to 50 percent higher cutting data compared to conventional HSS cutters.

Tony Pennington, managing director of WNT (UK), says: "WNT remains focussed on developing new products that enhance the productivity of our customers, whether that is the latest in carbide tooling or high speed steel. The combination of these latest cutting tools and the availability of the expertise from our team of technical sales engineers will allow customers to maximise their productivity in the most cost-effective way."

The new WNT Catalogue

With over 50,000 tools exclusively for metal-cutting applications, the new WNT catalogue, launched on the 1st June 2016, is a 'must-have' for all your machining needs. Each WNT catalogue is two years in the making, involving numerous revisions and the addition of 6,500 brand new products making it an indispensable companion for every machining specialist.

Given the size of the catalogue, at almost 2,000 pages in length, ease of use was a vital part of its development. WNT has standardised individual sections with the existing structure being re-invented to further simplify the clarity of the catalogue. Also, as with recent WNT catalogues the sheer number and variety of products contained in the catalogue has meant that it

has been split into two volumes. The main catalogue focuses exclusively on precision tools for the metal cutting industry, while the second volume features products for workpiece clamping.

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Indiana Evolution

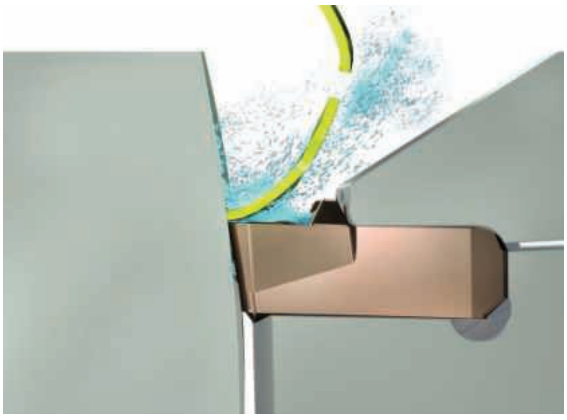
A job shop in the Midwestern US State of Indiana has cut insert costs in half and tripled tool life with Beyond Evolution™ grooving and cut-off tools from Kennametal

Since the day some ingenious machine tool engineer first mounted a metal tube on an engine lathe, machinists have been looking for a better way to cut off parts. From hand-ground bits to high speed steel blades to indexable carbide inserts, cut-off tool technology has continued to improve over the years, increasing metal-cutting efficiency and lowering operational expenses along the way. One large step in that evolution came with the development over recent years of multi-purpose cut-off tools able to switch hit as grooving, turning, and profiling tools, giving manufacturing companies the ability to simplify setups and shorten production cycles, and in some cases keep fewer tools in the crib.

Searching for simplicity

One such company is EMC Precision, a family owned and operated precision machining job shop headquartered in Elyria, Ohio. Since 1925, EMC has provided prototype to production machining and value-added services to a range of industries including fluid management, hydraulic fluid and power, automotive, recreational, and other OEMs. Ian Dotson, manufacturing engineer at EMC's Sheridan, Indiana facility says he was happy with the tool life and performance of his existing cut-off solution, and was only looking for a reduction in his tooling costs when he called his local Kennametal distributor, CCA Inc.

The salesperson there introduced him to Kennametal's Beyond Evolution™, a single-sided grooving and cut-off system with multidirectional turning capability, through the tool coolant, proprietary chip



control, and "Triple V" secure seating geometry. Dotson admits he wasn't too concerned about the bells and whistles, as long as the tool performed as well as what he was already using, and saved the company some money. He was pleased with the results.

Ian Dotson says: "We were using a 0.118 in. wide (3 mm) PVD-coated insert to cut off 0.75 in. diameter (19 mm) 4140 steel hydraulic actuators. We swapped out the old tool for a Kennametal Beyond Evolution cut-off and kept the feeds and speeds the same. After several runs, we determined tool life was essentially identical, so from a performance perspective there was no difference, at least not on this job. But the Beyond Evolution inserts are dramatically less expensive, roughly 40 percent of what we were paying for our legacy tools. It was a clear win for us."

Triple time

The next win came on a job Dotson was running on one of EMC's Daewoo Lynx 220 CNC lathes, a transmission gear shaft made of 1-1/4 inches. (32 mm) 8620 steel, and using a 0.236 inch wide tool (6 mm) to back turn a journal on the left side of the part prior to cut-off. In this application, insert cost was still a concern, but Dotson's primary goal was tool life improvement.

Ian Dotson says: "The Daewoo isn't equipped with high pressure cutting fluid, and the standard pump was unable to generate enough pressure for us to utilise coolant through the tool on our

old cut-off system. Because of this, we've been stuck with flood coolant, and have always had some chip control issues as a result the chip would roll back on itself and starve the cutting edge of coolant."

Despite the less than perfect cutting conditions, the Beyond Evolution performed beyond expectations.

Ian Dotson concludes: "We achieved very good results. This time we increased the cutting speed a bit, from 350 to 400 sfm, and bumped up the feedrates by about 30 percent. Even so, tool life increased threefold, to just over 2,600 pieces per insert. I'm confident we could have cranked up the feeds and speeds even more, especially if we had plumbed the tool for coolant through, but there was no need.

This operation supplies another machine, and that one was already running as fast as it could go. The big thing for us was getting more parts between tool changes, and that's exactly what the Beyond Evolution did. It's an excellent product at a very competitive price point."

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Multi-milling options made easy

Providing cutting tools for multiple materials and applications is a key focus for Dormer Pramet.

This objective is typified by the company's range of solid carbide end mills, which are suitable for the most popular operations. This includes slotting, side and face milling, ramping and copy milling in a wide range of materials.

Its S8 and S9 assortments, marketed under the Dormer brand, have for many years provided a reliable and competitive milling option for common applications. The ranges include different shank styles, flute options, cut lengths and surface finishes, including bright and coated alternatives.

Both feature a corner chamfer and modified end teeth geometry for multiple applications and materials.

To support this assortment, Dormer Pramet has recently added more than 40 new solid carbide cutters. This not only increases the range of applications covered to encompass roughing, super finishing and deep milling, but also includes material specific cutters.

A large share of the new assortment comes from the S2 and S7 milling families.

Dormer Pramet's S7 program further expands the multi-material milling options, while the S2 range extends the support to cover difficult to machine materials.

For example, the S7 cutters bring a differential pitch option, delivering reduced chatter, maximising swarf removal at high feed rates.

It offers a variety of diameters, in short to extra-long lengths, numerous flute options, a range of coatings, as well as roughing profile and corner radii options.

Dormer Pramet recently expanded this range even further with the introduction of the S713 and S716. These new cutters feature square corners to offer the user one tool capable of both roughing and finishing.

The S2 family includes all the benefits of the S7 range, with the addition of a variety of neck options for deep milling and multi-flute options for improved finishing in high strength steels and difficult to machine 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.

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Guhring takes-off with new aircraft end mills

If the name wasn't specific enough, the 'RF100Ti Aircraft' range of end mill tools from Guhring is a line of high performance end mills for cutting high tensile titanium alloys and special materials that are specified in the aerospace sector. The new milling series is ideal for slotting, ramping, plunging, trochoidal milling and orbital drilling, which makes this new innovation the tool of choice for the industry.

Specifically developed for the aerospace industry and the stainless steels and titanium alloys commonly machined, the new RF100 Ti Aircraft is a solid carbide range of tools with the choice of Guhring's TiAlN Super-A coating or the new Zenit coating technology that glides through the material with its reduced adhesion characteristics. The four flute end mill series combines the choice of these two coatings with a geometry design that has been meticulously developed for extending tool life, material removal rates and overall efficiency whilst reducing cutting forces with its swarf evacuation characteristics.

To extend the tool life of the RF100 Ti Aircraft, the coating technology combines with an optimised corner radius that ranges from 0.5 mm to 5 mm. Available in diameters of 6, 8, 10, 12, 16, 20 and 25 mm, the smaller tool diameters have the choice of six corner radii from 0.5 to 2 mm whereas the 16, 20 and 25 mm tools have a choice of eight corner radii from 0.5 to 5 mm. The face of the end mill also has a particularly large chip pocket and web thinning that permit reliable plunging and orbital drilling whilst rapidly disposing swarf from the cutting area.

To retain such impressive swarf removal characteristics on all types of milling operation, the RF100Ti Aircraft has a flute spacing that has been optimised with a deeper flute geometry in front of the cutting area. This feature aids chip removal and prevents re-cutting whilst a 38-degree helix angle further enforces the message that swarf is accelerated away from the contact point.

At the top of the flute, the Guhring engineers have applied an optimised transition angle that aids stability when conducting heavy material removal. With a maximum cutting length of 13 mm on the smallest 6 mm diameter tool and 45 mm on the 25 mm diameter series, the flutes have been ground to the optimum length for machining such difficult alloys. All these features have been put to the test and the new RF100 Ti Aircraft has demonstrated that it can rough machine TiAl6V4 grade titanium at a Q rate of 36 cm^3/min (cubic centimetres per minute) with a tool life in excess of 135 minutes. So, if you want to achieve this impressive material removal rates on aerospace grade alloys whilst getting greater flexibility from your tools, its time you tried the new RF100Ti Aircraft from Guhring.

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ITC extends market reach with long series PCD Tools

Established as one of the most successful UK manufactured cutting tool ranges, Industrial Tooling Corporation (ITC) Ltd has once again extended its renowned Cyber Series of cutting tools in line with the demands of the marketplace. The Tamworth manufacturer has now launched its new extra-long length 2151 Series to improve accessibility to hard to reach surfaces.

The 2151 Series is manufactured from a solid carbide micro grain shank improves rigidity and reduces vibration when machining faces and features in deep cavities. With an overall tool length of characteristics. The new range is available with the choice of an 8, 10 or 12 mm diameter with a length of cut from 10 to 12 mm. To maximise rigidity and cutting performance, the 2151 Series is provided shank diameters of 8, 10 and 12 mm with a maximum reach capability of 40 to 45 mm

2151 Cyber Series range of end mills for the machining of graphite, glass and carbon fibre composites.

Taking note of the ever changing demands of industry, the R&D team at ITC has developed the 2151 Cyber Series of two flute end mills for the machining of difficult to reach features on abrasive components. With graphite, glass fibre and carbon fibre components and assemblies becoming ever more prominent in the UK's aerospace and motorsport sectors, ITC has introduced the 150 mm, this ability to minimise vibration and chatter significantly improves surface finish whilst enhancing the tool life. In particular, this tool rigidity enhances the edge chipping resistance of the PCD cutting edges. To further extend the resistance to edge chipping when machining at high speeds and feeds, the 2151 is supplied with a 0.2 mm corner radius as standard.

The geometry and design of the 2151 Series permits centre cutting whilst demonstrating impressive heat dissipation depending upon the chosen diameter tool.

To maximise machining performance when cutting such abrasive and difficult materials, ITC recommends that customers implement high quality and precise tool holding systems, especially in the case of low powered machine tools.

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New M4000 porcupine milling cutters

Tooling expert Walter GB has expanded its M4000 family of milling cutters with the new M4256, M4257 and M4258 porcupine cutters which, like all its M4000 counterparts, boast cost-effective slot, ramping, pocket and shoulder milling, as well as circular interpolation routines, on steel, cast iron, stainless steels and difficult-to-cut workpieces.

The savings in users' production costs are due to a number of design characteristics. Of compact length (27 mm to 77 mm across the range), the new cutters operate at relatively low cutting forces and therefore reduced power consumption.

The resulting smooth operation reduces the tendency for oscillation and vibration, making the cutters ideal for unstable machining conditions.

Crucially, the cutters feature inserts of Tiger.tec Silver grades and, with their advanced carbide substrates and micro-geometry designs, these enable higher than usual tool rake angles to be achieved while edge strength and integrity are maintained.

Available in varying diameters, 20 mm to 32 mm for M4256, 40 mm to 63 mm for M4257 and 80 mm and 100 mm for M4258, the cutters can be supplied with Weldon shank, modular ScrewFit interface and bore adaption.

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Reducing part setup time by 90 percent

Maintaining the wall thickness of pump bodies and reducing the part setting time for manufacturing steering worm shafts is an important task for SuMax Enterprises Pvt Ltd, situated in Pune, India. It was made easy following installation of a Renishaw Primo™ system with Primo radio part setter and Primo radio 3D tool setter which has helped the company reduce part setup time by 90 percent and eliminate scrap (previously 12 percent) caused by machining.

Company background

SuMax Enterprises was established in 1979 to facilitate additional capacity to manufacture different products for its parent company, Vijay Engineering, a manufacturer of tooling systems and high-precision parts. Initially using conventional lathes and milling machines, SuMax supplied tooling, fixtures and gauges for checking components which directly contributed to Vijay's product development cycle. In 1998, as a result of customer demand, SuMax started manufacturing components for tractor manufacturer John Deere.

Today, SuMax has 65 machines, of which 35 are CNC machines used to produce high precision parts for automotive, machine tool and other industries. The company has the capacity to manufacture 100,000 components per month.

The big partnership

SuMax has always been considered a premium supplier of quality components focussing only on the manufacture of precision parts where a machining accuracy of ±10 microns is required. Manufacturing capabilities include turning, milling, broaching, cylindrical grinding and surface grinding. Inspection is carried out using a Coordinate Measuring Machine (CMM).

Managing director of SuMax Enterprises, Rajesh Suttatti says: "During evaluation of a CNC machine, a trial on one of our critical components was conducted at a machine tool supplier's facility and there for the first time we saw part setting being done using one of the Renishaw probes. We found it very useful and were convinced to adopt this technology while manufacturing our parts,"

Renishaw engineers advised which probe would be suitable for SuMax based on the application requirement. Using a Primo system has helped SuMax to increase machine utilisation time, eliminate scrap and reduce the time consuming tool setting process.

SuMax was attracted to the Primo system's 'pay-as-you-probe' concept with a low initial investment and a unique credit token system. Moreover, the Primo total protect cover provides complete peace of mind and safeguards the Primo system against any accidental damage by providing a comprehensive warranty.

Worry-free probing

The Primo system is available at an affordable price and aimed at providing a fast return on investment.

Consisting of a radio part setter and a Radio 3D tool setter, the system enables automated on-machine part setting, part inspection and tool setting. It helps to eliminate manual setting errors, improves accuracy and part conformance, and reduces non productive time and scrap. All of which increase productivity, improve quality and increase profits. The system is easy to use, simple to install and represents a low initial financial outlay. Its exclusive, enhanced warranty offers users complete peace of mind.

The innovative Primo credit token system offers users the flexibility to 'pay-as-you-probe'. Its 6-month renewable tokens allow unlimited use of the radio part setter and the Radio 3D tool setter within this period of time. The credit tokens are also available as an upgrade to enable unrestricted continuous use.

A Primo system was installed at SuMax in just one hour and as the system is so easy to use, it took the company only 15 minutes to get started. With the Primo training kit and pocket guide, it is very easy to learn and implement the system.

A key benefit is the elimination of the need for extensive G-code knowledge. The system is supplied with GoProbe, an innovative 'all-in-one' software package that simplifies part setting, tool setting and calibration. Simple, single-line commands are used instead of multiple lines of code which further eliminates the need for any special training.

Highly recommended

Rajesh Suttatti concludes: "Primo is worth recommending to other SMEs as it is worry-free probing because of the warranty available and the credit token system. It helped us in reducing our part setting time and scrap on our components. The manufacturing sector will definitely benefit with this product."

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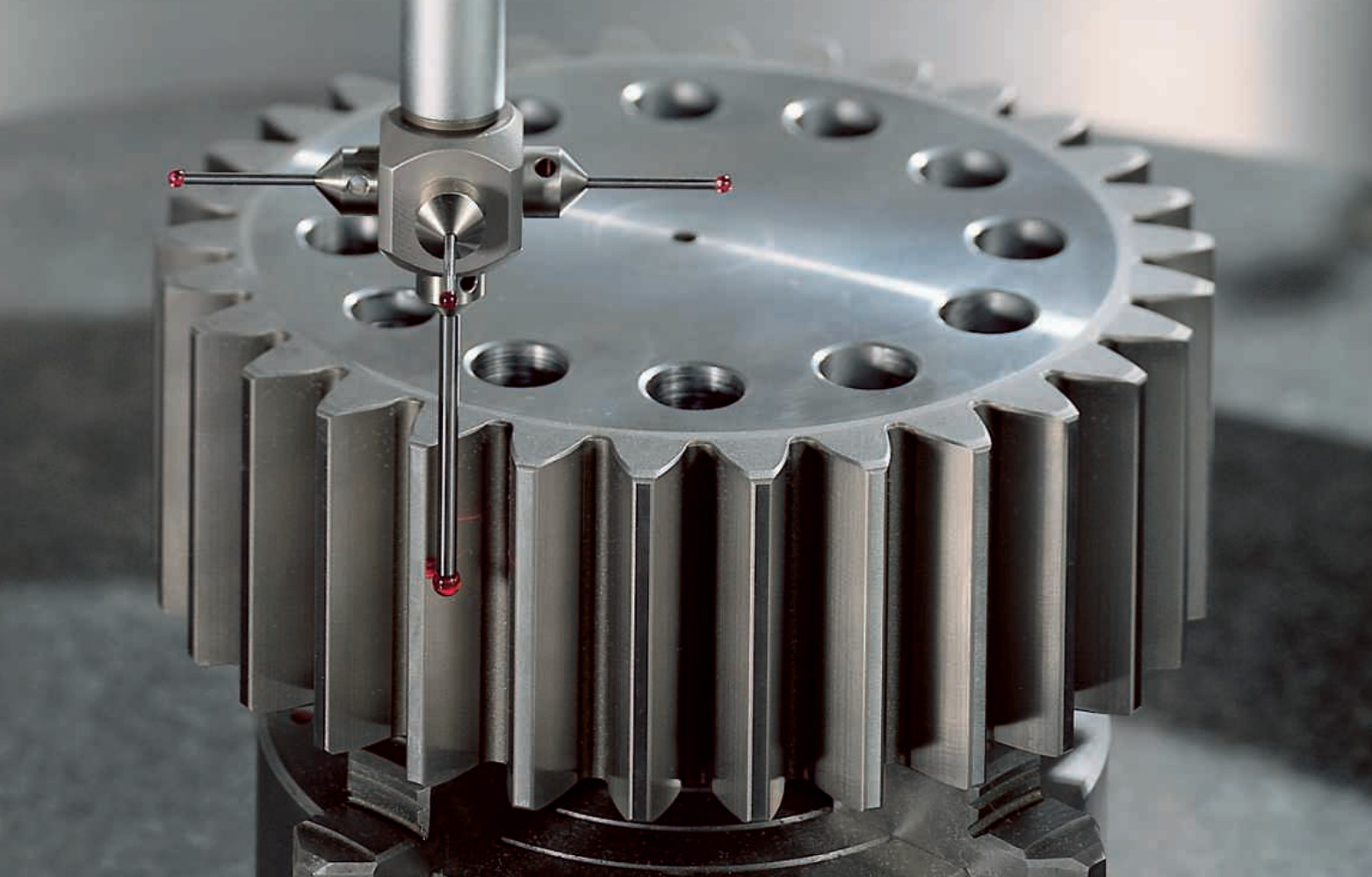

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Italian tool maker cuts lead times

The production of high-quality aluminium extrusion tools is an art in itself. Only few companies match the precision and quality with which the Italian Alumat-Almax-Matrex masters this process. Through the introduction of Blum Novotest laser measurement and touch probes in its machining centres, the manufacturing time can be reduced significantly and the accuracy of the products has significantly improved.

Competence, passion and know-how are attributes that account for the international success of the Alumat-Almax-Matrex Group. Thanks to continuous investment in research, development and cutting-edge facilities, as well as the selection of the right partners, the enterprise has become a pioneering manufacturer of aluminium extrusion tools in the international marketplace.

Alumat was founded in Ciserano near Bergamo in Italy in 1994. It employs about fifty staff in the design and manufacture of steel dies for aluminium extrusion. The continuous growth led to an expansion of the business resulting in increased production capacity and a tripling of sales within four years.

Time and quality are decisive

Emanuele Astolfi, manager at Alumat says: "The special thing about our activities is the

fact that our tools are essentially individual items created specifically for our customers. Not only do we supply individual dies, but also the entire planning and validation of the product.

"Reducing lead times has become a fundamental component of our strategy. It is what differentiates us from our competitors. From planning to completion, a tool will undergo up to 15 production steps that we currently realise in about six days This took us as many as 15 days some ten years ago."

This improvement required the deliberate use of machining centres and the attempt to optimise all processes. The company looked for systems that would avoid any down time and facilitate machine-integrated quality control. In addition, the systems had to allow direct access during each production phase, in order to correct any deviations immediately. Then, six years ago, Alumat decided to confide in the technology and professionalism of Blum Novotest. Since then, the machining centres have been equipped with BLUM systems that both check workpiece position, dimensions and also monitor the tools. These instruments soon facilitated the achievement of the desired quality level while delivering reduced lead-times.

Today all operations of the company use the Blum LaserControl system for contactless measuring and monitoring of the cutting tools. In many machine tools, the Z-MT Type tool setting probes ensure the high level of production quality.

BLUM TC50 touch probes for workpiece measurement

The robust measuring systems ensure exact positioning of the workpiece. The system automatically corrects the thermal expansion of the machine whilst the impressive probing speed of three metres per minute provides the speed to accompany the precision. As with all Blum probes, the systems work with a wear-free optoelectronic measuring mechanism that facilitates the precise acquisition of all measured data even under strong coolant influence.

The Micro-Compact NT and Mini NT laser measuring instruments allow reliable, contactless tool checking and measurement despite the interference of coolant and chips. This is warranted by the combination of the patented NT technology that has a protection system for the laser optics and also blowing nozzles for tool cleaning. Thanks to a focussed laser beam, the system additionally impresses with its particularly

high measuring accuracy even below nominal speed. This is conducted 24 hours a day and seven days a week.

The compact, hardwired Z-MT probe equipped with the revolutionary Shark360 measuring mechanism is ideally suitable for use in horizontal machining and turning centres. It is used for contact tool measurement, breakage detection, measurement of length and radius as well as axis compensation. Due to its integrated face gear, the Shark360 measuring mechanism guarantees the highest possible precision levels.

On account of the successful application at Alumat, these measuring systems were also introduced at the Almax sister company located in the Trentino region, which has been part of the group since 2004. Furthermore, the Greek company Matrex in Solanki, which is also part of the group, has also implemented Blum measuring technology.

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Improving machining and inspection of autoclaved composite parts

Reverie Ltd has improved its machining accuracy and quality inspection capability with the Baty R14 FT2-E profile projector. The Baty R14 provides Reverie Ltd with high accuracy non-contact measurement and inspection for the manufacture of autoclaved carbon fibre composite parts, and as a method of checking CNC tool cutter diameters and wear to improve machining accuracy.

Based in Colchester, Essex, Reverie Ltd is a highly accomplished and skilled carbon fibre composite design, repair and manufacturing company. With over 15 years of experience crafting the finest autoclaved carbon fibre composite parts from alloy or carbon composite tooling, they supply businesses and retail consumers with bespoke or batch produced high quality, repeatable carbon fibre parts. They also offer a diverse range of carbon composite parts for the electronics, communications, marine, home, construction and automotive markets, and a repairs service.

As a leading name in the automotive industry for the design and manufacture of advanced autoclaved composite, Reverie Ltd has recently used the Baty R14 FT2-E profile projector to measure the tolerance of key fob trims for a British automotive manufacturer of luxury, high-performance sports cars. Reverie Ltd produces a high volume of the key fob trims, and therefore required a quick and easy method of measuring to a tolerance of +/- 0.1 mm to ensure precise consistency and the highest quality product.

Reverie Ltd has also used the Baty R14 to measure CFRP trims; a new prototype part currently in production for a high-end male grooming company. The Baty unit allows Reverie Ltd to accurately measure the side profile and the plan profile of the tail end of the part, the accuracy of which is absolutely crucial to a good cosmetic fit to the casting.

Peter Farndell, design and manufacturing engineer at Reverie Ltd, says: "The Baty R14 unit is perfect for checking any suspect parts that are identified during visual checking, or for checking and validating any client returns for fit errors. It works excellently for these particular applications."

Reverie Ltd chose the Baty unit when it discovered that it was unable to measure the parts with its Faro Fusion Arm due to touch pressure. The Faro Fusion Arm requires the component to be touched during the measurement process. Due to the flexible nature of the CFRP parts, they have a tendency to become distorted in shape when handled, therefore producing inaccurate readings.

Another potential option was to use a white light scanner, which was not only unsuitable for achieving the required level of accuracy on small parts, it was also difficult to find and measure the edges of the component. The Baty, therefore, was a faster and simpler option as it boasts automatic profile edge detection.

Peter Farndell says: "The Baty unit makes measuring difficult parts that are too flexible to be held easier and quicker. The accuracy of the measurement is consistent and perfect for our needs, in fact the accuracy that the Baty unit is capable of achieving is more than we will ever need."

The readings that Reverie Ltd obtain from the Baty R14 FT2-E profile projector also enables the company to prove that finished components are within the tolerances that they quoted to the customer. This can be useful when handling potentially rejected parts, as proof of tolerance achievement allows Reverie Ltd to reduce scrap and provide the customer with assurances of quality and accuracy. As the key fobs are cut and trimmed by hand, there is naturally some capacity for variations between the components. The Baty unit allows Reverie Ltd to be consistent and accurate in their manufacture, therefore reducing the possibility of rejects and the costs associated with this.

Reverie Ltd also uses the Baty R14 FT2-E profile projector to check CNC tool cutter diameters and wear to improve its CNC machining accuracy. It's important that the wear on the CNC tools is monitored carefully, as damage to the tool such as nicks and chips have a negative impact on the patterns, moulds, and components that the machine is used to cut.

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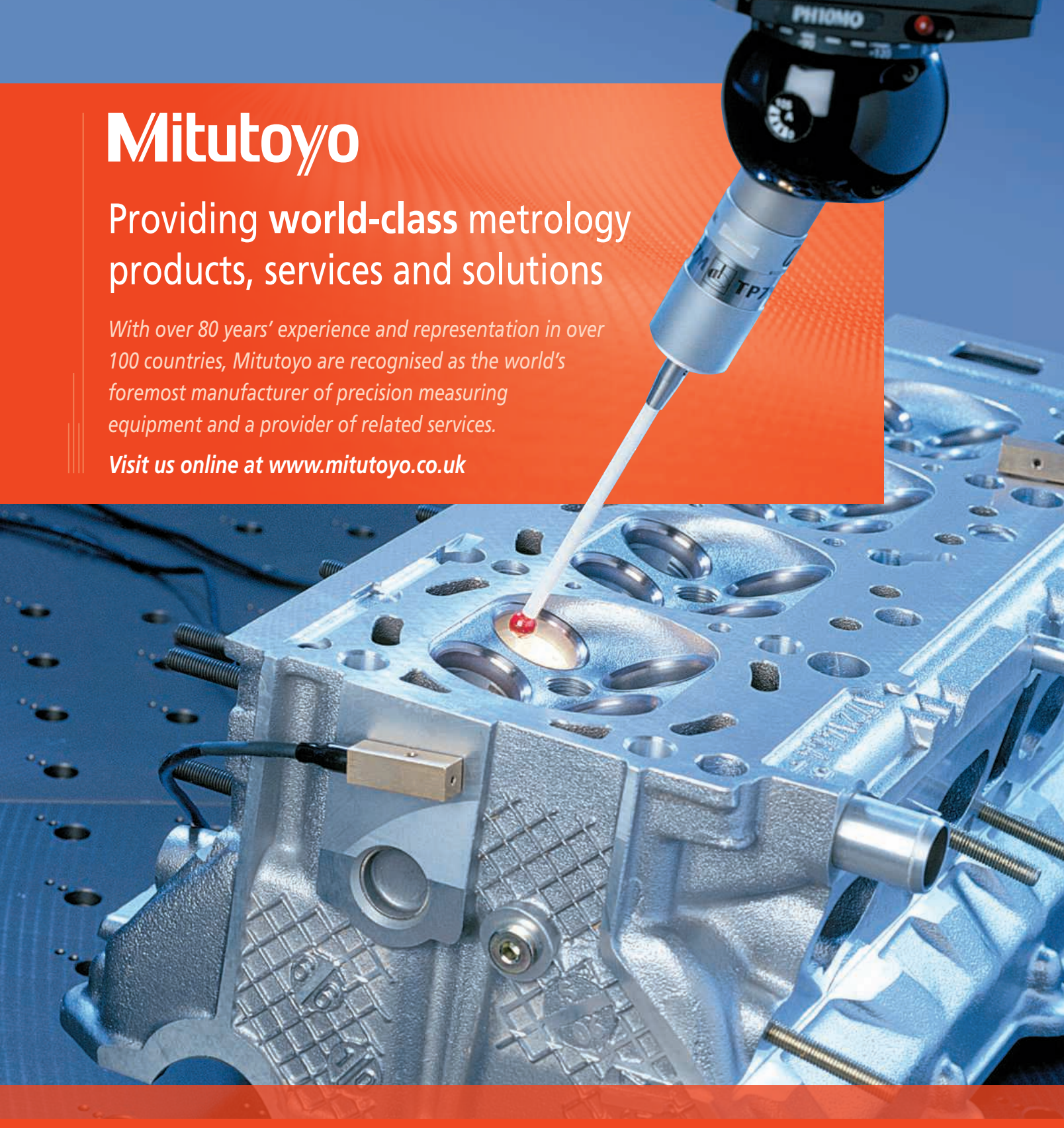

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New optical scanner

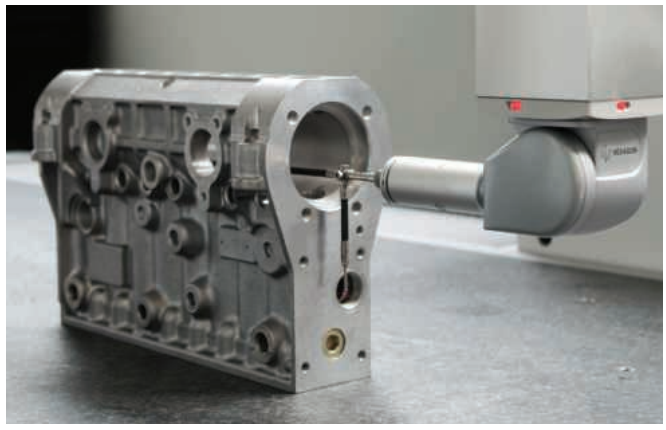
BLAZE 600M blue light portable measurement system offers improved flexibility and accuracy

Hexagon Manufacturing Intelligence has unveiled BLAZE 600M, the latest addition to its non-contact optical measurement range. Based on Hexagon's proven white light scanner technology, augmented with new technology and functionality, BLAZE 600M is a versatile manually-operated platform for rapid 3D data acquisition and provides actionable data wherever it is needed.

An all-in-one unit combining high-resolution digital imaging with blue light LED illumination, BLAZE 600M offers precision inspection in a robust, flexible and highly-portable package that fits in a single box. The system allows a wide range of measurement field size settings and maintains high-accuracy performance even when inspecting larger areas, ensuring maximum productivity without compromising on quality. BLAZE 600M is effective even on metallic, plastic and composite parts without surface treatment, and its fast data capture rate means that environmental conditions have negligible impact on results.

The BLAZE 600M system is available in two projection configurations, enabling users to optimise the system for their application, ranging from routine inspection operations to the measurement of complex feature-rich workpieces, challenging material types, or 3D digitisation for reverse engineering applications. Operators can also directly switch between different surface data acquisition modes to ensure the best possible results for each specific task.

Nathan Persky, general manager of the automated solutions product line at Hexagon Manufacturing Intelligence says: "The new technologies incorporated into BLAZE 600M move our optical inspection portfolio to a new level of performance. This system is not only more accurate than our existing range of white light scanning solutions, but also far more configurable. BLAZE 600M is very easy to setup and adapt to different part types and applications, and the additional measurement field options ensure maximum speed and productivity on the shop floor."



BLAZE 600M is available to order worldwide from today. More information is available through local Hexagon commercial operations and dealers.

New versions of HP-S-X1 series scanning probes offer better system flexibility and robustness

Hexagon Manufacturing Intelligence has released new versions of its HP-S-X1 series of compact probes for tactile scanning. As well as featuring a new bearing system for better joint repeatability, HP-S-X1 range probes now accept longer horizontal styli for improved flexibility with no need to change modules.

Featuring small external dimensions and supporting stylus lengths of up to 225 mm, HP-S-X1 probes enable Coordinate Measuring Machines (CMMs) to take measurements of features deep inside a workpiece. Magnetic interfaces allow automated stylus changes, and they support all standard inspection modes including single-point contact measurement, self-centring measurement and continuous high-speed scanning, providing quick and precise data acquisition for all kinds of surface contours.

The HP-S-X1 range of tactile scanning probes includes the HP-S-X1C centrally-mounted version for high-stability in measurement and the HP-S-X1S and HP-S-X1H models, which offer the option to use an indexing probe head for better part accessibility. In the latest versions, the HP-S-X1C and HP-S-X1H models accept horizontal styli of up to 100 mm, while the HP-S-X1S can now take horizontal styli of up to 20 mm without changing modules. A standard interface allows all the probes to be used on Hexagon probe heads.

Micha Neininger, product manager for sensors at Hexagon Manufacturing Intelligence says: "The latest versions of the HP-S-X1 scanning probe have been redesigned to improve durability, and also allow better setup flexibility without the need to change modules. Usually, to get this range of stylus configuration options, you would need a multiple-module system. With the HP-S-X1 range, users save the time it takes to change modules, so they are always able to apply the best configuration for the job, without compromise."

The latest versions of the HP-S-X1 compact scanning probe range are available to order worldwide.

Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, the company's expertise in sensing, thinking and acting together with the collection, analysis and active use of measurement data, gives customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

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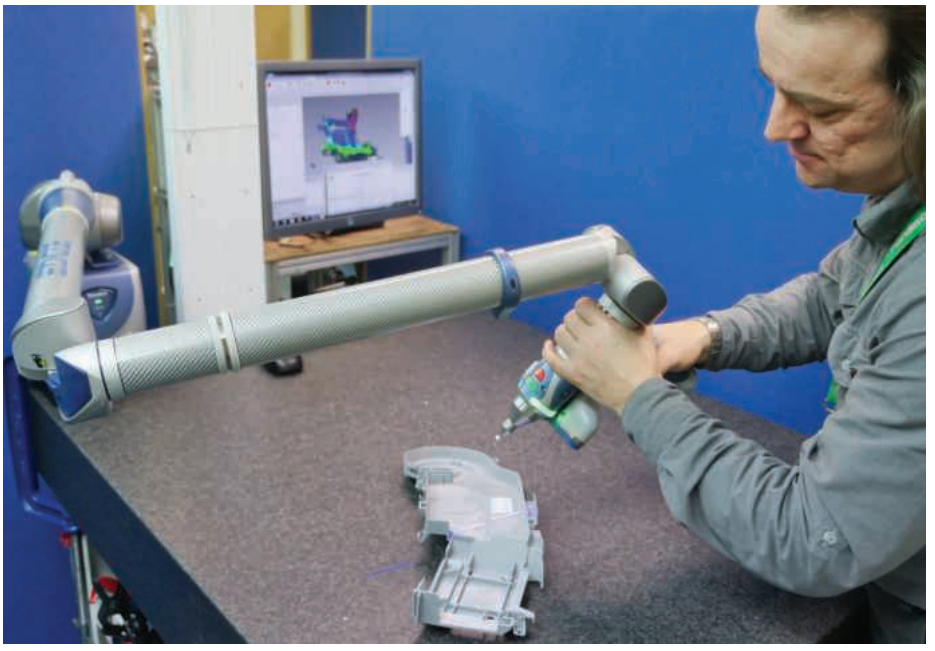
FARO delivers flexible measurement to Panasonic



Since being founded in 1918, Panasonic has expanded into what is today a multinational electronics corporation that operates over 500 consolidated companies worldwide.

Based on the outskirts of Cardiff since 1976, Panasonic Manufacturing UK Ltd. develops and manufactures a wide range of home appliances including microwave ovens and induction hobs. In addition, the company produces a range of mobile solutions such as tough books, touch pads and electronic point-of-sale systems. A recent addition to the company's impressive Cardiff site is Panasonic UK's fuel cell product research and development facility.

The company also operates an advanced testing facility that performs precise emission measurement tests across a range of products including TV, IT, video, microwave and medical products.

To establish self-regulated quality assurance processes in each group company, Panasonic published quality management system development guidelines in 2004. Each group company then implemented the Panasonic Quality Management System (P-QMS).

P-QMS complement the requirements of the ISO9001 standard with Panasonic's own quality assurance methods and experience to create a quality management system that aims to deliver the level of quality that the company demands.

Panasonic Manufacturing UK's stringent quality standards, diverse nature and size of the products that are both developed and produced on site, require the use of a wide range of relatively dedicated measuring instruments.

When faced with the need to find a universally applicable dimensional measuring technology that was able to undertake a wide range of highly accurate measuring routines that standard gauges were unable to perform, and that would further extend the company's precision capabilities, Anthony Coombes, senior engineer HAD field quality assurance at Panasonic Manufacturing UK, carried-out an in-depth search. Further complicating the quest, the chosen solution needed to be portable and to encompass both contact and non-contact measuring capabilities.

Having considered a couple of alternatives, Anthony Coombes purchased a FARO Edge ScanArm. The advanced FARO product combines all of the advantages of the FaroArm with a hand held laser scanner, resulting in an extremely flexible contact/non-contact measurement system. Unlike other scanning systems, the Edge ScanArm's hard probe and the laser line probe can digitise interchangeably without having to remove either component. Users can accurately measure prismatic features with the hard probe option, then laser-scan sections that require larger volumes of data all with one simple, precise tool.

Anthony Coombes explains: "Although a couple of the other available measuring arm systems were able to meet our requirements in certain areas, none were able to provide the multiple useful features delivered by the FARO product. We now make full use of the Edge ScanArm within many company departments.

"With the use of the Edge ScanArm, when a new product is in the development stage, we are able to create a fully surfaced CAD model and to ensure that first article parts meet design specifications and tolerances. Our new FARO system provides all of the necessary precise dimensional data and helps to reduce the time taken to bring a product to the manufacturing stage.

"An intuitive on-board measurement system means that we do not need to use a laptop alongside the Edge ScanArm, making it easier to transport and use throughout our site. Across several departments, we use the FARO unit to confirm the dimensional accuracy of tooling, we also use the FARO system within in-process volume production situations to quickly and accurately take measurements and to highlight deviations from nominal CAD data conditions.

"Although we usually use the unit's hard probe, as some of the parts we use are deformable, such as seals, we are able to use the Edge ScanArm's non-contact laser line probe to accurately measure them. We also use the laser line probe for scanning free-form parts.

"In addition to the Edge ScanArm's ability to efficiently gather dimensional data for our own internal use, it has also proved invaluable for providing feedback related to external vendor parts that have been supplied, and that are within specification but are moving towards out of tolerance conditions. When supplied to vendors, this

information allows them to make the required adjustments and to ensure the delivery of parts that are closer to nominal dimensional conditions.

"As well as quickly mastering the Edge ScanArm's intuitive controls, our operators rapidly became skilled in the use of CAM2 Measure software. FARO's easy to use software enables us to quickly and simply capture and use dimensional data gathered in both tactile and non-contact 3D scanning measurement routines.

"When using the Edge ScanArm for scanning free-form parts FARO's software allows us to view and to understand the captured data in a clear graphic, full colour format.

"FARO's Edge ScanArm has proven to be the ideal multi-use, accurate measuring tool for our diverse needs and is now making a valuable contribution towards upholding Panasonic Manufacturing U.K's stringent quality standards."

To guarantee the best possible Edge ScanArm user experience, internal counterbalances provides comfortable, stress-free usage, whilst FARO's smart sensor technology warns against factors that could compromise the Edge ScanArm's performance. FARO CAM2 Measure 10, as used by Panasonic UK, is an all-in-one metrology software system designed for users that are looking for a single, complete solution for all tactile measurement and non-contact 3D scanning applications. The software is ideal for CAD, non-CAD inspection and geometric dimensioning and tolerancing (GD&T). CAM2 measure 10 features image-guided measurement, automatic nominal association to various features, QuickTools and an intuitive user interface. Moreover, the software is delivered with a reliable CAD import tool which increases the ability to load a large amount of CAD data.

The smart software has the ability to connect multiple 3D measurements devices within the same coordinate system and simultaneously scan into a single seat of software on one computer. This capability allows users to quickly and seamlessly scan large objects and to complete 3D scanning jobs faster than ever before.

CAM2 Measure 10's live colour scan function increases the efficiency of the scanning process. Users can quickly scan free-form parts and check their quality in real time. The software provides immediate feedback with different colours deviations from the CAD model during the scanning process, supporting an easy and prompt identification of inconsistencies.

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Aberlink CMM passes 'Xtreme' test

The recent launch of Aberlink's ground-breaking, robust coordinate measuring machine, the Xtreme, caused quite a stir at MACH 2016. As the Xtreme has a unique configuration, unlike that of any other CMM, the innovative new machine attracted many curious visitors to Aberlink's exhibition stand.

The development of the innovative new Xtreme CMM was prompted by the growing trend for component inspection being performed at the point of manufacture, also by the increasing requirement for machine operators to measure parts within the cycle time of their machine tools.

Working from a challenging remit to create an inexpensive, accurate, easy to use, CNC driven CMM that could stand-up to the rigours of harsh operating environments and be able to undertake rapid automated measuring routines, it took less than two years for the demanding brief to be achieved. To help ensure that the CMM delivered on all of its aims, prior to launch an early Xtreme model was situated on the shop floor of what was considered a typical target user, North Devon based Jamestan Engineering.

Jamestan Engineering supplies precision machined components to the aerospace, autosport and oil & gas industries. Services provided include 2-axis and multi-axis turning, 2-,3-, 4- and 5-axis milling, surface and cylindrical grinding in addition to wire and spark erosion.

Centrally located on the shop-floor, the Xtreme trial model was available to all of Jamestan Engineering's machine operators. Paul Jeffery, Jamestan Engineering Ltd.

managing director explains: "In addition to other tasks, we decided to use the Xtreme to take in-process measurements of the high volumes of tight tolerance aluminium rings that we produce for an aerospace customer.

"Our quality management system meets the requirements of both ISO 9001:2008 and AS/EN9100 Rev C. As the quality of our output is all important, we were originally sceptical about the Xtreme's ability to provide the levels of accuracy we require in such a harsh environment. Given the safety critical nature of our aluminium parts and the potential for shop-floor temperature variations, we were initially worried about the ability of the Xtreme's temperature compensation function.

"Although, by cross referencing the Xtreme's results with those we achieved on the CMMs within our dedicated inspection department, our early fears were soon dispelled and we quickly gained complete confidence in the Xtreme's results.

"As Aberlink's management asked us to place the CMM within a challenging environment, to work it hard and to report any problems, we were happy to oblige. Given that the Xtreme was so easy to use, our operators were soon able to recall the relevant program for the part they were machining and to perform accurate, fast, automated CNC inspection routines.

"At the end of the 6-month pre-launch evaluation period, we were happy to report that despite the harsh surroundings and the sheer amount of work it performed, the new Aberlink CMM had completed thousands of very fast and accurate measuring routines and that we had not encountered a single problem.

"In fact, so impressed were we by the speed, accuracy and robustness of the Xtreme, and as the use of a shop-floor based CMM had given us so many advantages, we gave the machine the ultimate endorsement by purchasing the pre-production model from Aberlink.

"Now, the use of our Xtreme CMM has enabled our inspection department to concentrate on tasks such as final inspection, as all in-process checks are now made on the shop-floor. Also, as components are now measured so soon after production our already low scrap levels have been further reduced."

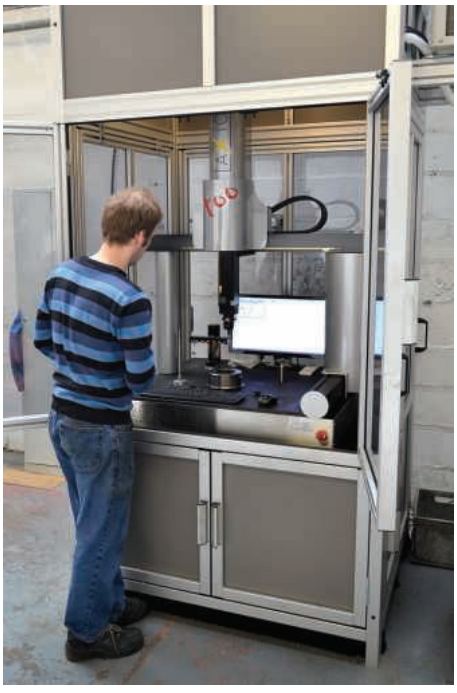
Chris Davies, Aberlink business development manager, says: "We are very grateful for the invaluable pre-launch assistance given to us by Jamestan Engineering. Although we had carried out exhaustive in-house trials and were confident that the Xtreme would deliver the required accuracy and speed within harsh environments, it was gratifying to know that it performed perfectly within the kind of production situation it was intended for."

The Aberlink Xtreme CMM was designed with a novel non-Cartesian structure and uses linear motors and mechanical bearings, this advantageous arrangement ensures that it maintains its accuracy at very fast measurement rates and does not suffer from the accumulative inaccuracies that occur in conventional 3-axis Cartesian arrangements.

As the inexpensive Xtreme requires no compressed air and has the shortest learning curve of any equivalent system, just one day without prior CMM experience, the robust Xtreme represents an ideal 'plug and go' solution.

Ensuring greater user productivity and profitability, the Xtreme utilises Aberlink's renowned 3D software. A welcome bi-product of any Aberlink 3D inspection routine is that a simultaneous picture of the measured component is created on the computer screen. Dimensions between the measured features, mirroring those that appear on the component drawing, can be simply picked off as required. In essence this

'smart' software represents an intelligent measuring system that is able to automatically recognise and define the various features being measured. Aberlink 3D is claimed to be the easiest to use and most intuitive CMM software currently available.

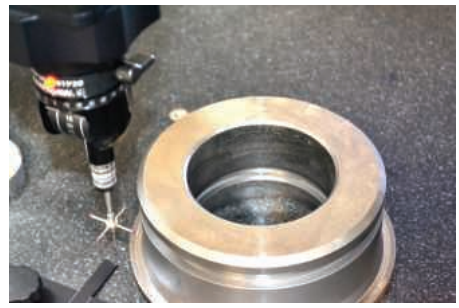


European CNC Turned Parts choose Aberlink CMM

Founded in 1980, European CNC Turned Parts Ltd has established an excellent reputation for providing a cost-effective service and for the manufacture and supply of high quality CNC turned parts.

Having pursued a policy of employing skilled staff and consistently reinvesting in the most up to date, high-yield CNC technology over the past 36 years, the company is able to deliver high quality CNC turned parts at a cost effective price to its still growing customer base. European CNC Turned Parts has formed long term relationships with many loyal clients.

Given European CNC Turned Parts' constant focus on product quality, a dedicated inspection room is equipped with an extensive range of precise inspection aids, whilst full S.P.C. analysis and reports are also made available. In addition to purchasing state-of-the-art machine tools, the company makes regular investments in the best available inspection equipment. As part of its on-going program of up-dating its quality function, the company has recently invested in an Aberlink Axiom too CNC Coordinate Measuring Machine (CMM).



European CNC Turned Parts Ltd. works manager, Roy Goodwin explains: "As a constantly growing order book had begun to place a strain on our inspection department, we recently decided to purchase an accurate, rapid acting Coordinate Measuring Machine that could keep pace with our output. We found the ideal answer to our problem in a high performance CNC Axiom Too CMM from Aberlink. Adding to its flexibility in addition to a touch probe the CMM was specified with a CMM camera to enable non-contact inspection routines to be performed.

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UKAS certification as standard on Cyclops C100L non-contact thermometer

AMETEK Land, a leading industrial infrared non-contact temperature measurement specialist, has announced that buyers of its Cyclops C100L will receive a designated three point UKAS certification to ISO / IEC 17025:2005 as standard.

Widely used in industries such as metal and glass production, as well as in ceramics, petrochemical and refractories, the Cyclops C100L portable non-contact thermometer provides UKAS certification against three temperature points as specified by AMETEK Land, which are 650 °C, 1200 °C and 1450 °C (1202 °F, 2192 °F and 2642 °F). Those temperature points were selected based on the most commonly requested temperature range for UKAS certification of the Cyclops C100L based on extensive certification experience stretching back over 40 years. Each Cyclops C100L shipped will be supplied with an individual UKAS certificate linked to the instrument's serial number.

Richard Gagg, global IR product manager for AMETEK Land, says: "This is the first time we have provided certification with a new product as standard and at no extra charge. Companies that choose our UKAS-certified Cyclops C100L will find that their instrument will be fully traceable, reducing risks to their business and ensuring peace of mind. When dealing with extremes of temperature that rely on accurate measurement, having instruments that are UKAS certified is essential to maintain the highest quality standards."

All new orders of the full suite of Cyclops models, including C100L, also will be supplied with a free-of-charge, heat resistant, thermal protective jacket, as standard. The jacket, provides protection against excessive heat and dust, is used extensively in the steel, foundry and glass industries.

Both the UKAS certification on Cyclops C100L and protective jacket are supplied as free additions on new orders, with no change to the existing selling price.

UKAS Certification ensures that the Cyclops C100L temperature measurement system offers the best operating performance, improves the accuracy of customers' measurement capabilities, and meets required national and international quality standards.

AMETEK Land's certification laboratory in the United Kingdom is certified to the international standard ISO / IEC 17025:2005 (General requirements for the competence of testing and calibration laboratories) and by the national accreditation body United Kingdom Accreditation Service (UKAS) to offer a comprehensive service for the traceable certification of infrared thermometers, thermal imagers, scanners and blackbody sources over the range -10 °C to 2500 °C (14 °F to 4532 °F). With the certified lowest calibration uncertainty outside the National Physics Laboratory for temperatures above 500°C, AMETEK Land is recognised as the industry leader in accuracy.

AMETEK Land Cyclops C100L is a high-quality, portable, non-contact thermometer that provides precision spot temperature measurement with unmatched accuracy and reliability. It incorporates user friendly features, such as precise view of target spot with simultaneous digital display of temperature in the viewfinder, choice of operating and calculating modes, digital output and out of range alarms.

The Cyclops is capable of storing up to 9,999 measurement points inside the thermometer, making it the ideal tool for plants with multiple locations and a requirement for regular monitoring. The handheld units are suitable for either Bluetooth® or USB Connector for data download and upload, whilst a Route mode,

one of four, single, latch, burst and route, allows capture and storage of measurement data repeatedly at set locations around a plant.

AMETEK's free-to-download land Cyclops logger software delivers a technically advanced user experience, as it connects a Cyclops portable pyrometer to a PC or mobile device allowing the user to view, analyse and record live temperature readings.

For more details on Cyclops C100L, visit: **www.landinst.com/products/cyclops-100L-portable-non-contact-thermometer**. For Cyclops Logger Software, this can be downloaded at **www.landinst.com/software-downloads** and for UKAS certification, go to: **www.landinst.com/pages/calibration**.

AMETEK Land is a business unit of AMETEK, Inc. a leading global manufacturer of electronic instruments and electromechanical devices. Land designs and manufactures a wide range of instruments for industrial non-contact temperature measurement, combustion efficiency and environmental monitoring.

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Creaform tackles automated inspection

New MetraSCAN 3D R-Series

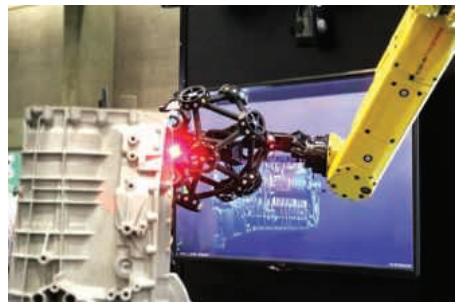
Creaform, a leading company in portable 3D measurement solutions and engineering services, has announced the latest generation of its automated inspection solution, the MetraSCAN 3D R-Series, which features drastically improved cycle times to further support industrial production control.

With built-in seven laser crosses, the system can now pick up to 480,000 measurements/second on complex surfaces with high reflectivity, providing faster data acquisition than ever before. Attuned to the needs and requirements of high-volume manufacturing operations, the robot-mounted optical-based 3D scanners seamlessly integrate within any working environments and without impeding the production workflow.

Jérôme-Alexandre Lavoie, product manager at Creaform says: "By extending our optical-based 3D scanning technology to automated quality control processes, Creaform meets the market's call for turnkey inspection solutions that can be seamlessly integrated right into the manufacturing stage.

"Along with enhanced shop-floor performance, the new MetraSCAN 3D R-Series enhancements capitalise on several application-oriented key features, such as an optimised robot reach to enable fast measurements of large parts with complex geometries. Its small shop-floor footprint and shop-floor-ready accessories provide easy control of the scanner parameters for maximum operator safety. Along with TRUaccuracy, it is also compatible with a turntable. This advancement in automated 3D metrology is a big step forward in informed manufacturing and production, and underscores Creaform's core values: versatility, flexibility and ease of use."

In addition to its rugged new design, the MetraSCAN 3D R-Series also features new glass-protected positioning targets that can withstand harsh environmental conditions and ensure overall improved durability in shop-floor environments, such as airborne dust or dirt, that could impact product lifecycle and require unnecessary and



repetitive calibrations.

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

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Next-generation safety laser scanner

With the launch of its next-generation safety laser scanner, the microScan3, SICK is promising a new era of improved personal safety and productivity. The microScan3 is the first safety laser scanner to use SICK's patented scanning technology, safeHDDMTM (High Definition Distance Measurement), based on advanced time of flight measurement.

SafeHHDM enables the microScan3 to operate reliably in difficult ambient light, dirty or dusty conditions where other technologies can fail. The microScan3 packs unprecedented performance into its compact size, with excellent resolution and detection of difficult-to-see materials with a wide range of 5.5 m and 275 degrees.

The uniquely-developed and patented high definition distance measurement algorithms used for the safeHDDM scanning technology use multi-signal evaluation to achieve a level of measurement reliability never before seen in safety scanners. Even a very dark object with just 1.8 percent remission, e.g. black clothing, is reliably detected.

Dr Martin Kidman, SICK (UK)'s safety specialist says: "SICK has led the way in reliable safety laser scanners for more than 20 years. Developing the microScan3 was all about making it easy for users to optimise workflow efficiency and productivity without compromising the safety of personnel.

"SICK has revised and optimised every detail of its laser scanner technology to set a new benchmark for machinery safety. The microScan3 is a rugged, high-performing and unobtrusive laser scanner, ideal for multi-sided machinery and production line protection at access and loading/unloading points, hazard points, hazardous areas and other critical safety duties."

The microScan3 achieves up to 30 mm object resolution, a protective field range of up to 5.5 m and a warning field range of up to 40 m. Up to eight fields can be programmed with two monitoring cases and there are three universal I/O connections which can be assigned various signals.

With a bright multi-colour clear-text display and additional status LED's, the microScan3 provides on-the-spot

operational status and easy to understand diagnostics information to allow adjustments or corrections to be made locally.

SICK's new safety designer software makes commissioning almost intuitive and the Smart core memory retains configurations allowing for rapid device changeover. SICK microScan3 has a lightweight, rugged metal housing with vibration resistant brackets, enabling easy installation and adjustment. M12, 8-pin connectors, mini USB interface and a system plug with integrated configuration memory ensure simple, low cost, smart connectivity.

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Marsh Metalworks improves productivity with SOLIDWORKS

Marsh Metalworks, which specialises in steel construction for the building industry, has used SOLIDWORKS 3D CAD to speed up its design process from initial drawing to approval by 30 percent, and with 100 percent accuracy. SOLIDWORKS was supplied by New Technology CADCAM, the designers' and engineers' choice for technical software, professional services and advice.

Marsh Metalworks director and designer Kevin Marsh had been using AutoCAD 2D throughout his career to produce customer drawings. Now running his own business, with son Terry, they wanted to improve productivity and costs in three key areas of time, cost and quality.

Before using SOLIDWORKS, each new order at Marsh Metalworks would be created as a 2D drawing and sent for customer approval, before being sent down to the shop floor for manufacture.

Getting the drawings approved was causing delays, as any dimensional changes, requested by the customer, would require every drawing to be started again from scratch.

Kevin Marsh says: "I would often send a project for initial approval and there would always be something that needed changing. On average each model would have 15 or 16 drawings, and if one dimension needed to be changed then all 15 drawings would have to be done again.

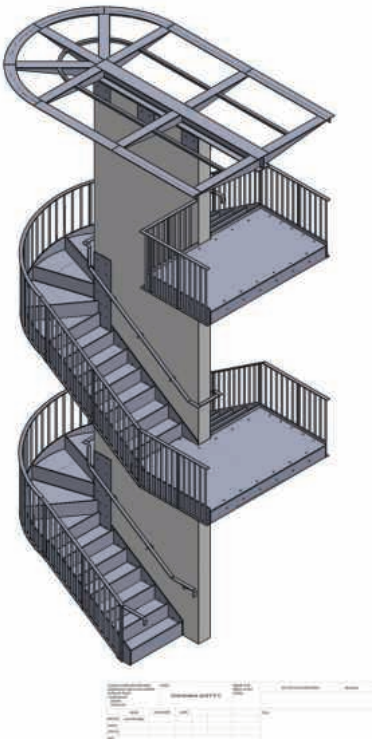
"Some of the biggest balcony designs I've done have had 35 separate 2D drawings. If the customer decides to change the levels, I would have 35 new drawings to do which could take two to three weeks. It was a massive drain on getting orders processed."

The company was also struggling to find employees that could accurately read 2D drawings. This meant Kevin's time could be tied up further with shop floor queries, higher levels of manual errors and delaying production.

To reduce the annual cost of 2D upgrades from AutoCAD, Kevin researched other 2D products and discovered DraftSight from Dassault Systemes that was free to download and included free updates. But he still wanted to improve their day-to-day design flow. Once they were up and running with DraftSight he requested a demo for another Dassault Systemes product, SOLIDWORKS 3D CAD.

Moving from 2D to 3D was easy because SOLIDWORKS' software lets you preserve the value of 2D .DWG data with accurate data conversion, accommodating reusuable 2D geometry and enabling a smooth transition.

SOLIDWORKS 3D CAD lets the designer automate the creation of drawings and automatically check designs for common errors and auto-updates while they work. The auto-updates functionality was key for Kevin, as any alterations made in the CAD model would be automatically replicated in all the workshop drawings without having to individually start each drawing from scratch.

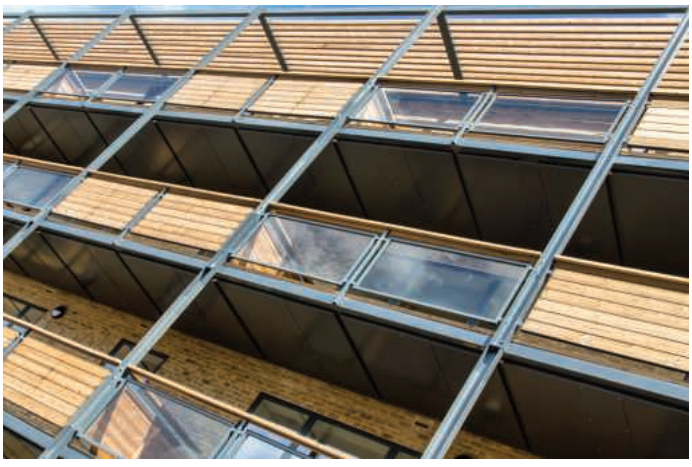


Also included in the software is SOLIDWORKS Weldments, a design tool specifically targeted for the steel construction industry. The software enables Kevin to design weldment structures as a single multibody part, sketching the basic framework, creating structural members with groups of sketch segments and adding elements like gussets and end caps to complete the structure.

Kevin Marsh says: "SOLIDWORKS Weldments is exactly what our design process was crying out for. When I'm doing a drawing now, all I need to do in SOLIDWORKS is draw a line where I want the steel to go. I go to Weldments and pick out what I need from a comprehensive list of pre-defined structural shapes, such as an eye beam. I no longer need to draw that eye beam, I just click the line, move it to where I want the beam to be, top-middle-edge or back-corner, for example. This is a massive time saving. If they haven't got what I need, I can always do a sketch of what I want and save it in my Weldments profile and it will work in exactly the same way."

Being able to automate designs has been

a big time saver too, especially for producing bespoke 'same but different' pieces. Kevin explains, "I've now got models saved in SOLIDWORKS that I can quickly alter to fit bespoke dimensions. For example, we do a standard stair balustrade and I've got all the dimensions drawn up in SOLIDWORKS, so when I go to survey a new one and the dimensions are different, it will only take me a couple of minutes to make a new drawing. So the beauty is, unlike 2D, I don't have to start from scratch every time a new job comes in, even though each job is unique."



Using SOLIDWORKS 3D CAD, Kevin has virtually eliminated the time it takes to implement design changes and their design process from initial drawing to approval is now 30 percent faster and with 100 percent accuracy.

Kevin Marsh says: "The normal industry standard for any 2D alterations is two weeks because it is a lot of work, but SOLIDWORKS has had a dramatic effect on getting our orders processed. Working in 2D it could take me days to implement any dimensional design changes; in SOLIDWORKS 3D CAD I can do the alterations in the time it takes to drink a cup of tea. I can alter a full set of fabrication drawings by just editing the CAD model and everything else is updated automatically. All the dimensions including lengths of beams, positions of plates, angle and pleats are all referenced and everything changes at once.

"On average we can produce a full set of fabrication drawings 30 percent faster and accuracy is 100 percent. The 3D drawings are much easier to interpret so the shop floor isn't struggling to see what the model should look like at the end. With SOLIDWORKS it means we can process orders faster, the shop floor is more streamlined and any manual errors have virtually been eliminated."

On New Technology CADCAM, Kevin Marsh concludes: "New Technology CADCAM is our SOLIDWORKS reseller. They gave us all the training and telephone support we needed. Whenever I've been stuck there has always been someone on the end of the phone, who can share my screen and sort it out. Usually I would ring them up when I couldn't find a sketch that I had drawn, but they showed me how to go into the tree and find it. But really I haven't had much use for it because their training was so good."

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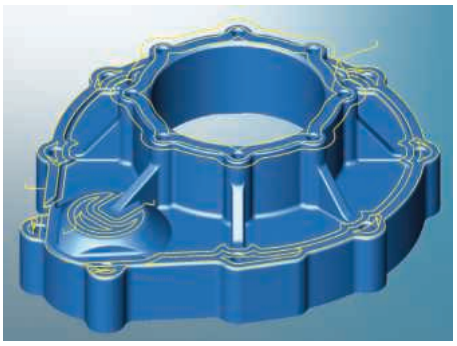
hyperMILL with greater performance and ease-of-use

OPEN MIND Technologies, a leading manufacturer of CADCAM solutions has now introduced hyperMILL® 2016.2 with a host of enhancements in 2D, 3D, 5-axis and HPC machining that will boost performance and ease of use. Highlights of the new version include 5-axis tangent machining from the hyperMILL MAXX Machining HPC package and also the 5-axis optimised rest material roughing module that ensures extremely short calculation and processing times. In addition, hyperCAD®-S the CAD for CAM system has also been significantly improved.

The hyperMILL MAXX Machining HPC package has once again been expanded to incorporate 5-axis tangent machining of any arbitrary faces with conical barrel cutters. Delivering results with speed, the use of conical barrel cutters enable performance increases of up to 90 percent compared to conventional production methods. This special feature of the OPEN MIND enhancement is the application of barrel cutting tools that have radii of up to 1000 mm on the side of the tool. This unique tool feature allows the tool to conduct greater step-over distances that reduce tool paths whilst improving the theoretical roughness. The result is extremely fast production times with optimum surface quality. In addition to this module, the hyperMILL MAXX Machining package includes powerful solutions for roughing and drilling.

Tool saving 5-axis strategies

New strategies for 5-axis machining can undoubtedly speed up production and save tool life and machine service life. The conical interpolation results with the "fast movement optimised" tool positions on conical way around the pole. So simultaneous 5-axis movement is generated with less acceleration of machine axes. The 5-axis optimised rest roughing creates high-speed cutting (HSC) optimised tool paths for the rest machining from a previous roughing operation. The definition of the tilt angles for the B- and C-axes are very simple. The user can choose whether to automatically create the tilt angle in the '3D mode' within a specified angular range or generate it from the normal planes. All connecting paths between the tilt angles are optimised and fully checked for collisions. This indexed machining strategy offers many advantages. Firstly, shorter tools improve stability and performance. In particular, deep cavities and hard-to-reach areas can be processed economically with this cycle.



More performance for 3D machining

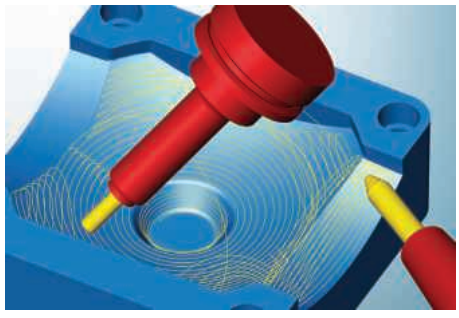
OPEN MIND has given hyperMILL 2016.2 numerous enhancements for 3D operations. One new feature is the impressive 3D plane level machining. Toolpaths for finishing levels can be quickly and easily generated. Three new functions are available for 3D optimised rest material roughing: The 'avoid areas' option can exclude specific areas from processing; The 'undercut optimisation' feature avoids unnecessary redundant movements in undercut areas when performing multi-axis machining on stock; The 'plane level detection' is used when plane level needs to be machined using a different step-down, an intermediate step is added automatically.

CAD for CAM

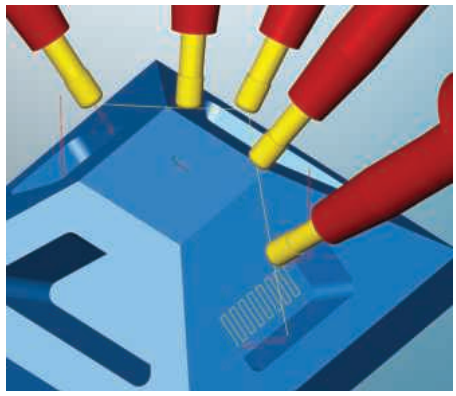
In hyperCAD-S, plane curves or texts can now be created without distorting the geometry angle on a cylindrical surface or rotational faces. The direction, scaling and mirroring can also be modified.

With the function 'compare and merge' users can compare revisions of CAD models and select the geometry elements to insert them into an existing document. All not-modified geometries remain in hyperMILL. So, only the updated fields have to be reprogrammed. For the user, the work will be accelerated considerably.

OPEN MIND is one of the world's most sought-after developers of powerful CAM solutions for machine and controller-independent programming. OPEN MIND develops 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 strives to be the best and most innovative CADCAM manufacturer in the world, helping it become one of the top five in the CADCAM industry according to the NC Market Analysis Report 2016 compiled by CIMdata.



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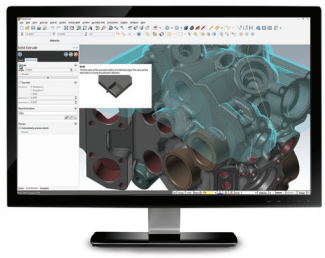
CAD for CAM design tools provide flexibility

Mastercam is known for precision NC programming, but it also delivers a suite of shop-tested design tools aimed at getting parts on and off the machine as quickly as possible. Powerful modeling tools include not only 3D surfacing and solids, but hole-filling, direct editing without a solids history, geometry repair, and much more.

Mastercam Design streamlines and simplifies modeling and editing geometry. It also supports advanced geometry creation, including NURBS curves and surfaces, 2D and 3D associative dimensioning, surface extension, blending, trimming, splitting, variable filleting, solid modeling, hybrid modeling, and complete your jobs quicker and more efficiently.

Dynamic Xform
Allows the user to switch between gnomon manipulation and geometry manipulation mode at any time without having to reselect geometry. Mastercam X9 allows the user to switch modes as often as needed, which greatly enhances the usefulness and workflow of this function.



Solid Disassemble
Solid Disassemble is a new model prep function that takes a solid assembly and lays each body out in a single plane to help simplify toolpath creation. It works on models with and without history, imported from other systems, or created from within Mastercam. Automating this process saves the user multiple steps in preparing an assembly for manufacturing.

Solid Position
This tool helps users to place and align solid bodies in relation to each other. Users can pick a face of a solid body and quickly mate it to a face of another solid body. This function allows you to redefine the base position of the body being moved, and then also redefine the final position on the body it moved.

Other Mastercam X9 design improvements include: associativity between solids edited with model prep tools and toolpaths has been greatly improved. When bodies are edited, only the toolpaths directly affected by the change in the solid body are marked dirty; many bounding box improvements such as Push-Pull technology as well as the Apply and OK/NEW buttons allow users to complete one bounding box and start another without having to restart the function; a selection from the back of a solid is now available any time general selection is active; both the Xform Offset and Offset contour options have a join and a slot option.

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Measure and detect tooth variations against CAD

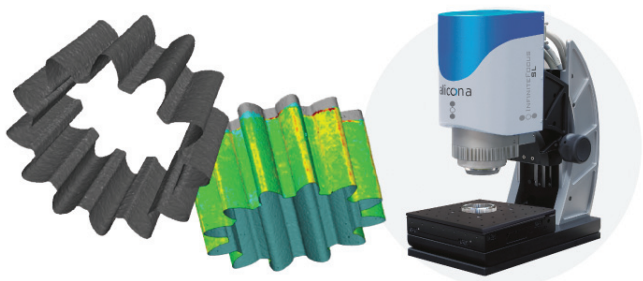
A new measurement module enables the measurement of all the teeth of a micro gear in one single measurement.

Based on the cooperation with Frenco, international specialist for gearing technology, you can now measure deviations from the involute of a tooth flank. Amongst others, measurable parameters include form and slope deviations of both profile and helix, single and cumulative pitch deviations as well as runout error.

In conjunction with a precision rotation unit you can achieve full geometry measurement of micro gears. This enables you to measure geometries such as tooth thickness, space width, and pitch diameter. In contrast to conventional measurement techniques, the optical and area-based technology of Focus-Variation allows for the measurement of all tooth flanks of a micro gear. Based on the largest deviation compared to the CAD dataset the relevant positions for the extraction of the profile and helix are easily defined. Thus the gearing engineer obtains revealing parameters about the maximum deviations of the manufactured gear.

Alicona is a global supplier of optical 3D surface measurement solutions for quality assurance in the lab and in production. The company's key competence is the measurement of form and roughness of even complex, miniaturised geometries. With focus-variation, a key technology, Alicona offer a technique that combines the functionalities of a micro Coordinate Measurement Machine (CMM) with those of a surface measurement system. For a user, this means to measure both form and roughness of components on an areal basis. The stable and robust technology of focus-variation delivers repeatable and traceable measurements even in a production near environment.

The product range includes a number of standard as well as special solutions. Research and development acts very close to the direct need of industry, which enables the design of both standard products as well as special solutions based on industrial partnerships.



Alicona UK Ltd
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Software offering custom-built solutions for the railway industry

From the first steam trains to old-time locomotives right up to the high speed TGV, the railway world has always been at the cutting edge of progress and technological innovation. To meet the challenges of today and particularly tomorrow, key companies within the train and rail market have chosen Lantek's sheet metal software solutions as its benchmark for advanced productivity.

Specialising in flame cutting, plasma, laser, water jet cutting and metal punching, Lantek is also a pioneer in on-demand management software solutions (MES/ERP).

As a result of over 25 years of experience and working closely with constructors and end users, Lantek software combines machine technology perfectly with rail sector customers' programming and management needs. The capabilities of the software are ideally suited to the manufacture of specific parts used in the railway industry whilst also optimising the whole manufacturing process.

Lantek CEO, Alberto Martinez says: "Lantek provides the rail industry with greater control of safety issues and the means of implementing intelligent transport solutions thanks to full command of manufacturing procedures. It provides an overall vision of how we'll be travelling on tomorrow's trains. We aim to offer constructors reliable new solutions incorporating end users' needs, security constraints and constantly changing technology."

Many parts designed using the Lantek software are focused on passenger comfort and meeting their requirements not only through ergonomics, materials and the cutting of shapes, but also through layout and assembly.

By working all over the world through its regional offices and network of distributors, Lantek treats geographic proximity to its customers as a priority, enabling them to keep to short deadlines. Its reaction speeds are appreciated by companies that have put their faith in it, like French company Alstom: "Lantek is capable of working all over the world, regardless of the location of your production site or your customers' setup."

A range of software tailored to the building of trains and rails.

Lantek software is available in several modules to provide an appropriate solution to each production and management requirement.

Lantek Expert: CADCAM nesting software for cutting sheet metal using flame cutting, plasma, laser, water jet (Lantek Expert Cut) and punching (Lantek Expert Punch).
Lantek Flex3d Steelwork: CADCAM 3D software that can optimise CNC programming of 3D machining devices for tubes, ducts, girders, moulded plastic and sheet metal that can be associated with complementary tools for piercing, marking, forming, bevelling or other tasks.

Lantek Wos: Controls and monitors production by providing the necessary tools to collect data during the manufacturing process on the workforce, inventories, materials and machines, helping companies to produce cost effective parts of the best possible quality.

Lantek Flex3d Addins: Importing native CAD drawings from popular systems such as SOLIDWORKS®, Solid Edge®, Inventor®, Catia®, and Creo Elements/Pro™ (formerly Pro/ENGINEER). An adaptive tool for automatic bending of all sheet metal drawings into 3D.

Masterlink: System created to transfer orders between the company and existing management systems particularly allowing data to be imported on the quantity of sheet metal used, the scrap generated and products created.

Alberto Martinez says: "Many world famous companies in the railway industry are already using Lantek software. These include Alstom in Brazil, Peru, Turkey, Spain and Italy and also companies such as CAF Mechanics Metal in Germany, Global Transporte Industria Servicio in Mexico and others throughout the world."

Time and cost savings thanks to monitoring production as a whole

Lantek Expert runs all the machine technology and calculates the time and the cost per part to control profitability. It also offers a library of parametric parts and an open database allowing users to call up parts, manufacturing orders, etc. and to just fill in specified criteria such as material used, thickness, customer or date to get the desired information.

Alberto Martinez says: "Our team of R&D engineers have worked hard on making the software easier to use and more accessible and user friendly despite the complexity of the tasks it is capable of processing. It is an intelligent and ultra-perfected tool designed to home in on the rail industry's expectations."

Just one piece of software for a wide variety of uses

Lantek provides a combination of unbeatable multi-purpose functionality and great flexibility. These assets enable it to adapt to the needs, problem issues and very specific expectations of each of its customers in their efforts to find the best technical and technological advances and to

stand out in the highly competitive railway industry.

Alberto Martinez explains: "Our software has been developed to provide a custom-built solution for each need. This is our number 1 asset. It can be used upstream during the initial design of trains and infrastructures as well as throughout the entire manufacturing chain thanks to its multiple capabilities."

Industry 4.0 applied by Lantek

Industry 4.0 is a collective term embracing contemporary automation, data exchange, and manufacturing technologies, directed at the value chain organisation which draws together Cyber-Physical Systems (CPS), the Internet of Things (IoT) and the Internet of Services (IoS).

Industry 4.0 facilitates the vision and execution of a "Smart Factory" where cyber-physical systems monitor physical processes, create a virtual copy of the physical world, and make decentralised decisions. Over the Internet of Things, cyber-physical systems communicate and cooperate with each other and with humans in real time. Via the Internet of Services, both internal and cross-organisational services are offered and utilised by participants of the value chain.

The aim of Industry 4.0 is to improve the competitiveness of a company with the aid of technology. Companies need to be efficient and able to make decisions in the shortest time possible. Every second of a machine not in use is money wasted. With that said, nor should it be using all available machine capacity if managers aren´t sure that it is profitable. In the end, all actions must be measured so one can understand the effect they will have on the Income Statement.

So how do companies move towards Industry 4.0? The answer is simple: Digitally model the factory. To do so companies need to explicitly define the manufacturing processes, choose key operational indicators and define how they are to be achieved. Managers then have to house these processes and indicators within a management system that allows them to view their status and to take operational decisions and steps to improve.

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KISTERS 3DViewStation desktop

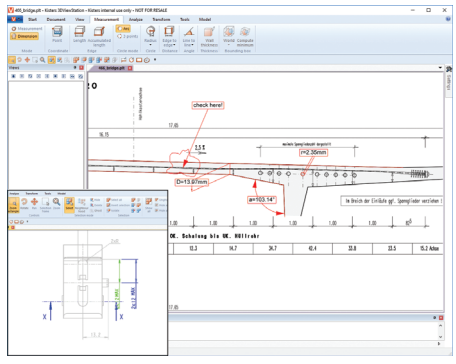
KISTERS has announced the release 2016.1 of the 3DViewStation Desktop version. By adding 2D analysis and markup functionality 3DViewStation continues its expansion to 2D market. The KISTERS 3DViewStation Desktop is known for its modern user-interface, high performance viewing, advanced analysis and integration capabilities into leading systems. 3DViewStation ships with current and mature importers for a broad range of 3D and 2D formats including i.e. Catia, NX, Creo, SolidWorks, SolidEdge, Inventor, JT, 3D-PDF, STEP, DWG, DXF, DWF, MS Office and many more.

For sometime, KISTERS 3DViewStation Desktop has supported the reading of various 2D file formats from different sources, like Autodesk DWG, DXF, DWF, MS Office formats like DOCX, XLSX, PPTX but also Gerber, HPGL and many Bitmap file formats like PNG, JEPG, TIFF and more. With the 3DViewStation V2016.1 release now important functionality related to 2D file formats has been added. Similar to the existing 3D counterparts now 2D compare is possible, 2D measurements, 2D dimensions and 2D markups. The background of 2D drawings and also the colour of all 2D objects can be changed now to black or white.

The new features of 3DViewStation can be reviewed in more detail at **http://blog.kisters.de**

The KISTERS 3DViewStation is developed by very closely following customer requirements; it is available as Desktop, ActiveX and HTML5 WebViewer product-versions. All product versions are intended to be used together with a PLM-, ERP- or other management system like product configuration or service & spare part applications, providing all necessary APIs. For cloud, portal and web-solutions there is a HTML5-based WebViewer solution available, which does not require any client installation at all. All file formats can be used in combination with the intelligent navigation and hyperlinking features to address needs of complex integration scenarios.

KISTERS, a medium-sized company that



was founded as an engineering office in 1963, develops leading software solutions for the sustainable resource management of energy, water and air and for environmental protection and safety, transportation telematics and 3D viewing. KISTERS' hardware sales department supplies equipment such as large-format printers (2D and 3D) and scanners. The company is also still active in the area of engineering services. KISTERS is a sought-after solution partner in an international context.

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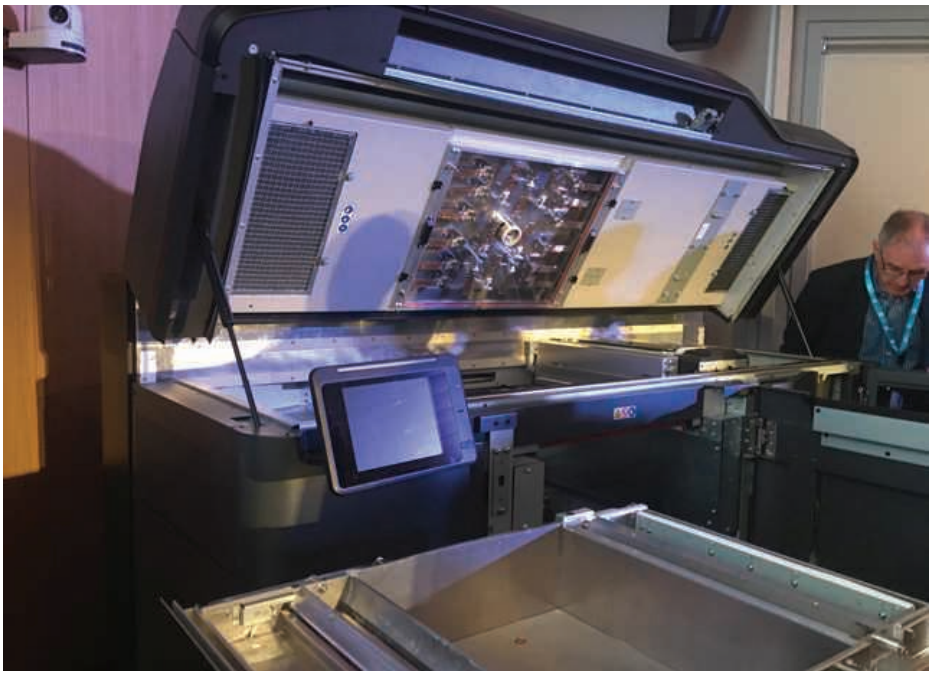
HP launches Multi Jet Fusion 3D Printers

On 17th May at the Rapid exhibition in Orlando, USA, HP went public with the launch of its first two in-house developed 3D printers. The printers measure an impressive 2,178 x 1,238 x 1,448 mm and weigh 730 Kg. The printers are also accompanied by a standalone processing station to assist cooling and the recycling of materials. With prices starting over $100,000 the broad appeal of these first offerings will be for firms with a serious throughput of prototypes, but HP considers high-end a good place to start, with plans to scale down the technology in the future to serve smaller engineering groups.

Offering a build volume of 406 x 305 x 406 mm the machines feature HP's new Multi-Jet Fusion (MJF) technology, which combines expertise from the company's wide-format high DPI ink jets with powder substrates.

Initially aimed at high-end users and service bureaus, HP aims to deliver machines that can deliver major speed and cost advances over today's SLS and FDM-based 3D Printers.

Claiming print speeds of up to 10-times faster than existing technology, with strong tensile materials, HP aims to eventually deliver production-ready functional parts, in volume for less cost than injection mould.



The process

The key ingredients of HP's 3D printing technology are a 1,200 dpi print head, which delivers fusing and edge defining agents (liquids) to the width of the build chamber in one pass.

There's also a powder deposition head which adds a layer of material in-between each print pass and a lot of finely controlled heating elements. For each fusing pass the machine captures a thermal image to ensure melting temperature was reached and consistency of fused material.

Fusing at around 170°C the machine gives off a lot of heat and will need to be kept in a managed environment.

One of the other key innovations is that the build chamber is actually a detachable wheeled unit, which can be wheeled over to the processing station for cooling and material recovery, while another build chamber could be inserted in the 3D printer for a new build to begin. The build unit also acts as the powder store and includes many temperature sensors for pre-heating and monitoring the cooling process. Most likely serious users would utilise the feature, with at least two build units to maximise the use of the machine.

HP has quoted typical full builds as taking 10 hours to print and, with the processing station, 10 hours to cool, with smaller build volumes, it is possible to get same day parts with 2.5-hour print, 2.5-hour cooling.

The machines

The HP Jet Fusion 3200 and 4200 are the initial offerings in the range. Both have a resolution of 1,200 dpi but differentiate on speed and thickness of layers.

The 4200 printer can deliver 45,000 mm^3/hour with 0.07 to 0.12 mm layers, whilst the 3200 Printer delivers 35,000 mm^3/hour with 0.08 to 0.10 mm layers.

The HP Jet Fusion processing station works with both Multi Jet Fusion machines and is also a sizeable beast, measuring 1,926 x 1,245 x 2,400 mm.

The processing station fulfils a number of roles. First it accelerates the cooling of the portable build chamber by up to 5 times, provides vacuums to clean, remove and recycle unused material, and finally mixes this powder with fresh material and deposits this in the portable build chamber, to be used for the next build.

HP expects delivery of the 4200 to begin in late 2016, and the HP Jet Fusion 3D 3200 Printer to follow soon after in 2017.

Pricing starts at $130,000 for the 3200, and the full end-to-end solution including the processing station is available starting at $155,000.

Materials

At launch, HP only offers one material, a nylon-based, non-toxic, black polymer named PA12, but this is expected to expand to at least five of six materials before the end of the year.

HP has already been demoing full colour parts, as well as elastic parts printed in Thermoplastic Elastomer, while stating that it will also offer high temperature plastics, flame retardant Polymide, thermoplastics and commodity plastics.

HP is working with Evonik, BASF, Arkema, Lehmann & Voss & Co to deliver more materials and is creating an open market for a vibrant materials ecosystem.

While HP will take a slice of this action when it comes to selling it to users, HP executives were keen to point out that getting the materials down in price was a key ingredient for the success of the 3D printing market, pushing against traditional manufacturing for runs in the region of 50,000 parts.

Of course the powders are only one of the ingredients in the HP recipes, there are the fusing and detailing agents and here the company explained that by even using the same base powder and tweaking these agents it's possible to get different physical properties and shore hardness.

This also opens the way for colour, which probably isn't too far behind, and even the possibility of conductivity, which essentially means PCB tracks, aerials, even RFIDs could be 3D printed in a single build process.

Voxels

A core concept behind the printer is the voxel-based (3D pixel) approach that HP has taken.

The entire build space is broken down into trillions of 3D printed points, which are addressed by the tens of thousands of print heads which print the agents onto the powder

HP claims that it's possible to control the agents going to each and every one of these 3D voxel points, enabling complex internal structures, mixtures of colour, mixtures of strength and elasticity at a single voxel level all amounting to an immense level of pre-processing.

Software workflow

On the issue of pre-processing, HP quotes about an hour for the pre-preparation of the model and the printers come with their own suite of tools to ease the workflow.
The software loads parts or assemblies, heals holes and will auto layout the build chamber for optimum usage and speed. For now, parts are spaced 5 mm apart but it's hoped that this will be reduced by the time the machines ship in the Autumn.

File formats

While supporting the standard array of industry format, HP is keen to promote the emerging 3MF format and stated that it hoped to replace the STL file format with all its shortcomings of processing time and poor object dimensional precision.
STL also doesn't lend itself to a voxel approach to printing, so all the granular benefits that HP is developing will be limited if the data is delivered as a 'dumb' STL.

In competition

HP is targeting the high-end SLS and FDM machines, with the metrics the company has released suggesting that given the same time and part that FDM could print 50 parts, SLS 250 and MJF 2,500.

Cost-wise HP claims that to produce 2,500 small parts in the same time, FDM average part price would be $3.70 requiring 29 printers running simultaneously, SLS would cost $2.80 and would require eight simultaneous machines and MJF would be $1.60 with one machine.

Using multiple build chamber units, the 3D printers allow for near continuous high volume production, always printing and a build always cooling. With the same small part build example as before, HP claims its machine could print 5,000 units a day or 30,000 in a week.

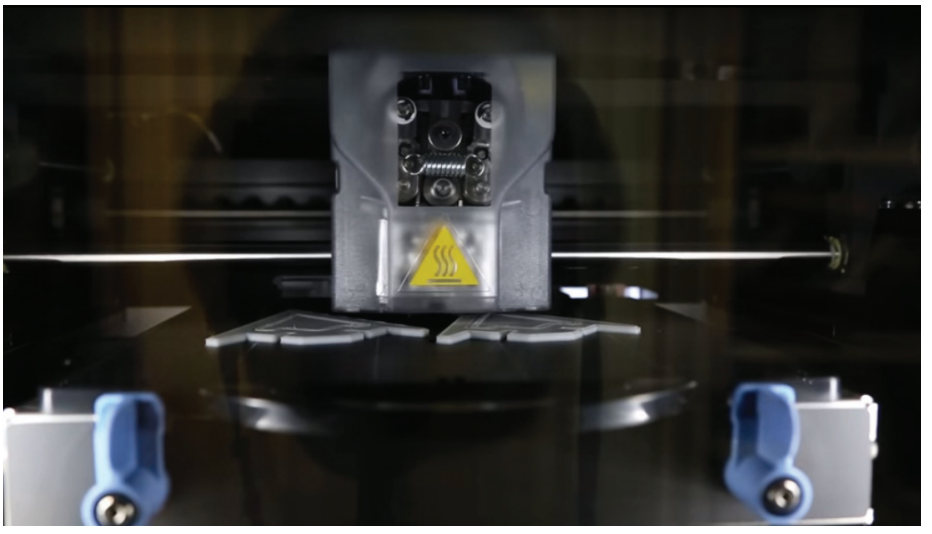
In the development of the printers HP has been working with Jabil, Shapeways, Proto Labs, and Materialise.

Shapeways CEO Peter Weijmarshausen was at the Barcelona pre-launch event and was very upbeat about the HP printers, saying this was the biggest innovation for six years at this price point, and was effusive on HP's approach to tailoring the design and features for their market. All Weijmarshausen felt was missing was the support for colours, which is soon to arrive.

While HP accepts the prototyping market is its first destination, the company fully expects 3D printed parts to make serious in-roads into creating production-ready parts within the next few years, predicting up to 50 percent of all custom plastic parts will be made this way.

HP 3D Printing
www8.hp.com

Fortus 3D printers in the spotlight at Stage One



Stage One, a leading manufacturer of bespoke parts and assemblies for the creative industries, is taking advantage of two recently installed Stratasys 3D printers at its 8,000 m² site at Tockwith, near York. The new multi-material machines, which were supplied by SYS Systems, have changed the way the company designs and manufactures its solutions, opening up new opportunities to work faster and smarter.

Three large hangars form the centrepiece of Stage One's impressive facility in North Yorkshire. This generous space allows the company to innovate, experiment and manufacture everything from a single circuit board to a 42 m long scenic icebreaker.

Edwin Stokes, head of R&D at Stage One says: "We specialise in stages for events and opening ceremonies, as well as structures for architects. We produced the cauldron used at the opening ceremony of the London 2012 Olympics and much of the behind-the-scenes engineering. Anything that's complicated is our forte."

The company, which employs around 100 people and is a recent winner of a Queen's Award for Enterprise in the Innovation category, is certainly well equipped to cater for the extraordinary. On site can be found a woodworking shop, metalworking shop, paint shop, electrical workshop, technical department and CNC machine shop. However, 3D printing was, until recently, something absent from its portfolio of capabilities.

CEO Mark Johnson says: "Initially, we were considering the use of large scale 3D printing for an R&D project, to help some of our panel and 3D geometry manufacturing. As a result, we went to see SYS Systems and found them to be very helpful and responsive. SYS showed us lots of different technologies and we soon realised that there are a lot more benefits in terms of wider prototyping and engineering requirements within the business. That led us down the path of wanting to make real products and components for general use."

With all the options considered, Stage One selected two Stratasys Fortus models: 250 mc and 900 mc 3D production systems.

Edwin Stokes explains: "We chose Fortus machines from SYS because we had identified FDM [Fused Deposition Modelling] as the right technology for Stage One. We had a range of capabilities in-house and 3D printing with FDM fits in very well amongst them, particularly as we wanted something that could produce large parts in a variety of materials. However, because price was also an issue, we saw FDM as being a good balance between cost effectiveness and versatility."

FDM Technology is a powerful, Stratasys-patented additive manufacturing method. It builds concept models, functional prototypes and end-use parts in standard, engineering-grade and high performance thermoplastics. In fact, it is the only professional 3D printing technology that uses production-grade thermoplastics, so parts are unrivalled in mechanical, thermal and chemical strength.

3D printers that run on FDM technology build parts layer-by-layer from the bottom up. The process begins by heating the thermoplastic to a semi-liquid state, which is then deposited in ultra-fine beads along the extrusion path. Where support or buffering is needed, the 3D printer deposits a removable material that acts as scaffolding. Once complete, the user simply breaks away any support material or dissolves it in detergent and water, and the part is ready to use.

Such was the initial impression created by the Fortus machines at Stage One that the company soon began to think about establishing its own R&D capacity in-house at Tockwith.

Mark Johnson says: "That thought-process led us to look for grants and other things which we could exploit from the machines. So it has actually been an enabler to a new department, and really changed the way we look at things and the way we approach problems."

The Fortus 250 mc offers a build envelope of 254 x 254 x 305 mm. Users can specify tool paths, adjust material density, fine-tune

part orientation and choose from three available layer resolutions. Nine standard colours plus custom colours are available, with parts offering accuracy of ±0.241 mm depending on geometry. For bigger parts, Stage One turns to its Fortus 900 mc, which can produce durable, accurate, repeatable parts measuring up to 914 x 610 x 914 mm. There are two materials bays for maximum unattended build time, while three-layer thickness options allow users to strike the right balance between fine feature detail and speed.

Aside from the technology, Stage One also singles-out SYS Systems for praise, highlighting a "fantastic" experience of partnership working.

Edwin Stokes says: "SYS are knowledgeable and supportive, and very open about the specific benefits of each machine. We've had examples printed for us and been to SYS's facility in Derbyshire to see demonstrations. Today, we are using 3D printing more than we thought we would, for applications that we didn't really consider at first. For example, for making consoles and drive systems for some of our winches."

It's the impact of the Fortus 3D printers on the production side of the business, however, which has made the biggest impression. In fact, the company says that the Stratasys machines has added to the quality of the output witnessed at the opening ceremony of the 2015 European Games in Baku.

Mark Johnson says: "For Baku, we first utilised the clay models by scanning them. We then printed models for reference before creating the actual scenic elements at large scale. That's really what we're looking for 3D printing to incorporate into our business, a full service provision. Furthermore, the real, bona fide materials that we can use mean the application becomes much more usable. It's not just a toy that we're manufacturing, it's a real component that we will use in a product. Specific things like that really add value."

A machine such as the Fortus 900mc is able to build parts in 12 production-grade engineering thermoplastics to cover a myriad of different applications: ABS-ESD7 for static dissipation; ABSi for translucence; ABS-M30 in six colours for high tensile, impact and flexural strength; ABS-M30i for biocompatibility; ASA in 10 colours for greater mechanical strength, UV stability and aesthetics; FDM nylon 12 for maximum toughness; PC for superior mechanical properties and heat resistance; PC-ABS for highest impact strength; PC-ISO for biocompatibility and strength; PPSF for highest heat and chemical resistance; ULTEM 1010 for highest heat resistance, chemical resistance and tensile strength; and ULTEM 9085 for the best mix of mechanical, chemical and thermal properties.

Edwin Stokes concludes: "The machines are faultless; we get good accuracy, and they are fantastic for a broad range of materials. Investing in the machines was definitely a good decision. It has opened up new ways of working and created a new capability in-house."

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Fast and economical waterjet cutting at 6,200 bar

This summer, KMT Waterjet Systems is presenting its latest development in the field of high-pressure pumps for waterjet cutting. With the new STREAMLINE PRO-III model series, the company makes waterjet cutting in the ultra-high-pressure range of up to 6,200 bar a great deal more efficient. KMT has achieved this by significant improvements in the pressure intensifier, especially the new SUPRALIFE high-pressure seal, for which the manufacturer specifies a guaranteed service life of 500 hours. With the 93 kW pump (125 hp) in the PRO-III model series, KMT can now offer an extremely efficient combination of motor power and water pressure, allowing the fastest cutting speeds in the industry.

With the STREAMLINE PRO-III model series, KMT Waterjet Systems offers the latest generation of its successful PRO pump range for waterjet cutting at up to 6,200 bar. The new high-pressure pump allows significantly longer running times, thereby also extending the maintenance intervals, reducing operating costs and making ultra-high pressure waterjet cutting more efficient.

Improved usage times thanks to optimised design of the SUPRALIFE high-pressure seal

The pump owes the improved running times in particular to the new SUPRALIFE high-pressure seal. To extend the usage times and thus to increase the efficiency of the high-pressure pump, KMT has revised the design of the high-pressure seal. The result is a seal package that is no longer installed in the bore of the high-pressure cylinder as it was previously, but is integrated into a cartridge, which seals against a chamfer at the end of the cylinder. Thus, damage to the cylinder bore is avoided and the service life of the high-pressure seal and the cylinder body is increased.

A constant pre-loading of the system is required to ensure the best functioning of this interaction of SUPRALIFE seal and high-pressure cylinder. This is achieved by a hydraulic pre-loading device. To facilitate maintenance, a special set of tools is used, which guarantees the required pre-loading at every maintenance operation performed. When treated properly, KMT Waterjet Systems guarantees a minimum running time of 500 hours for the new SUPRALIFE high-pressure seal.

In addition, KMT was able to use its more than 40 years of experience in the construction of pressure intensifiers to guarantee optimal use of materials and compliance with the highest precision and smallest tolerances. This results in an optimised geometry of the metal seal between the cylinder and the sealing head that can withstand the extreme water pressure of up to 6,200 bar longer than conventional technologies, thus lengthening the overall service life of the pressure intensifier.

Simple retrofitting of older pump models

KMT offers an upgrade kit for all customers who already work with ultra high-pressure and operates a KMT high-pressure pump of the STREAMLINE PRO-I or PRO-2 model series. This means that existing customers can also benefit from the advantages of the PRO-III pressure intensifier. The upgrade kit includes the new pressure intensifier and corresponding installation material and is easy to install on all PRO series pumps.

Save twice over at 6,200 bar

Waterjet cutting at 6,200 bar is efficient with the STREAMLINE PRO-III high-pressure pump. The longer running times of the high-pressure components have a positive effect on the machine running time and thus on the entire production process. In addition, the model STREAMLINE PRO-III 125 provides a combination of motor power and cutting pressure unrivalled in the industry. At 93 kW / 125 hp, two cutting nozzles with a diameter of 0.28 mm or one nozzle of up to 0.38 mm can be used at maximum pressure. The cutting speed can therefore be increased by up to 50 percent compared to conventional 4,100 bar applications and in some cases even more. The high cutting speed has the additional advantage that less abrasive is required for each cut workpiece, a major cost driver in waterjet cutting. This allows users to save twice over: firstly in the operating costs of the high-pressure pump and secondly in the consumption of abrasive.

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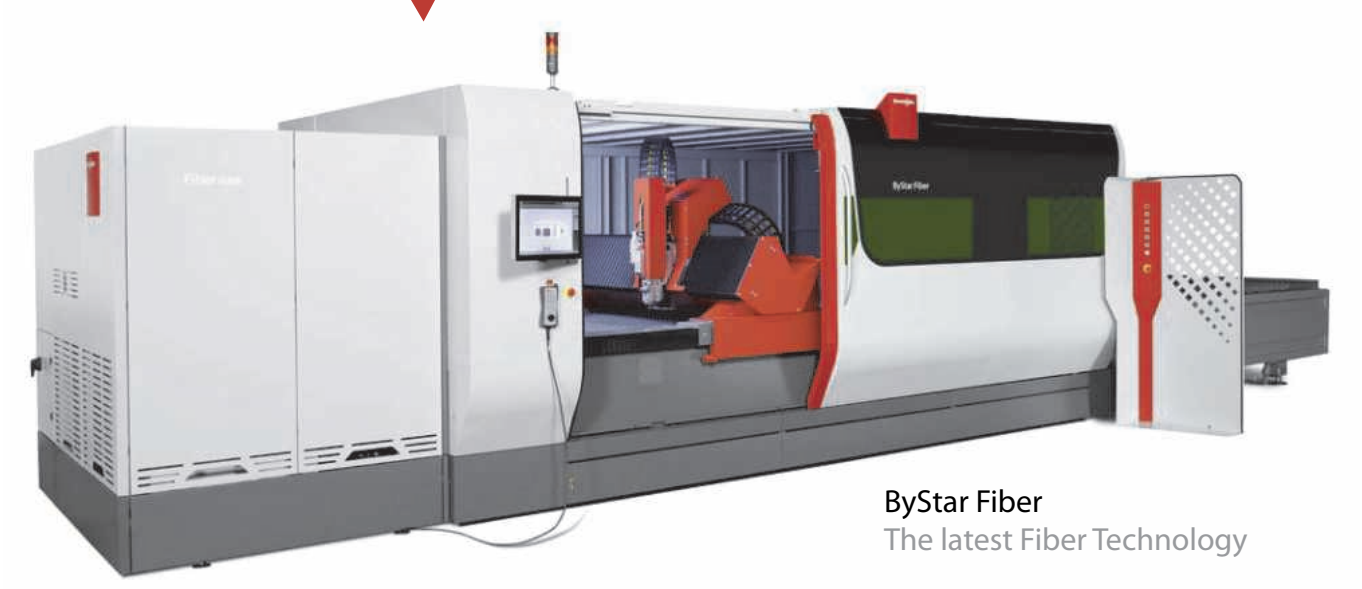

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Yorkshire firm expands in search for global opportunities

Creative Waterjet have gone 'big' with its addition of a second waterjet cutting machine

The West Yorkshire-based company has gone from strength to strength since forming in 2008 and, after running at maximum production on its original waterjet machine, it was time to take the plunge and add a second system.

The addition of a 6 m x 4 m, four headed, Water Jet Sweden machine, with twin intensifiers and online sand delivery, gives them the all out production facility the company needs to progress to the next level.

Creative started life in the subcontract market with a 3 m x 1.5 m twin-headed Water Jet Sweden machine and a single KMT pump. The original system, still running at full capacity today, provided a machine which would suit multiple applications and the versatility of pure water and abrasive cutting with a level of high precision.

Managing director, Richard Miles has 20 years of waterjet experience and explains why they chose Water Jet Sweden, over other suppliers:

"As a start-up company selecting the right machine was a priority. We needed accuracy and reliability along with good service support and technical backing. Having reviewed the market we opted for WJS UK as our machine supplier."

In 2016, Richard Miles felt the time was right to move forward with increased capacity. After a thorough technical evaluation of market options they decided on a 6 m x 4 m table.

Richard Miles says, "The reliability and service support from WJS made the decision on which supplier to go for straightforward. Several machine models where considered before opting for a 6 m x 4 m with four cutting heads. With increased supply to the factory at Cleckheaton, Creative WaterJet talked at length with WJS for options to give the company a market edge."

"By increasing the installation from another two pumps to three we were able to utilise WJS's Superstream technology giving a 50 percent increase in the feed rate at which the machine runs. Having also reviewed running at 6,000 bar, we felt that

4,000 bar offered considerably lower maintenance costs, increased reliability and machine up time. All this means we can supply our customers quicker and with less downtime."

During the past eight years, Creative WaterJet has established itself as a company focused on quality. Not satisfied with just supplying the UK market the firm has cast their net far and wide in search of new opportunities. By providing services to to companies throughout the UK, Canada and Europe, Richard Miles feels that its new machine can give them a competitive advantage in the market.

Richard Miles continues: "The new system gives the company the tools to add to a wealth of application knowledge, which when utilised by a client can offer far more than a cutting service. The increased speed and additional cutting heads placed Creative WaterJet on a competitive footing with laser cutting. Waterjet cut quality, at near laser prices, is something very new to the market offering clients a competitive edge. In addition to the reduced component prices, the increased capacity has dramatically reduced lead-times, something the market was demanding."

Water Jet Sweden sales director, Gavin Bell concludes: "The installation of this unit has given Creative WaterJet a market edge whilst also saving them money on garnet and consumables. We've worked hard with other customers too to help them make the most out of their systems and ensure that they can reduce the costs of their application without sacrificing on speed or quality."

"We have always looked to add value to customers rather than just focusing on cost. We are constantly working at our technical centre, in Wetherby, to test and improve so we can pass these benefits on to customers. This is just another example."

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The first helicopter made in Switzerland has lifted off. Designed, constructed, and built in Switzerland, it is now setting out to conquer the skies. Marenco's Swisshelicopter contains numerous innovations and technological refinements.

The overall volume in the market for civil turbine helicopters is approximately 1,200 machines per year. At least half of the machines sold belong to the sub-2.5-tonne class. Some analysts even forecast an increased demand of up to 900 machines per year in the field of lightweight helicopters.

Marenco CEO Martin Stucki estimates that his company could realistically manage a series production of between 80 and 100 machines per year. He expects continued growth in the European economic area, in the USA, in South America, especially in Brazil, and in China, where they are starting more or less from square one. Southern China and the Himalayas region are mountainous and there is a lack of air transport capacities. In these regions, there are entrepreneurs on the lookout for machines, for whom the versatile and cost-effective Swisshelicopter is the perfect solution. However, there are also companies in Switzerland, where approximately 60 Airbus AS-350 helicopters, three Bell 407s, and one Koala A-119 from Agusta are currently registered, for whom, with its attractive price of approximately 3 million Swiss francs, the Swisshelicopter could represent an alternative. For Rega, the Swiss air rescue service, however, it is not an option. In Switzerland, rescue helicopters are required to have twin engines, as opposed to the USA, for example, where there are no such requirements. There are no differences with regard to accident statistics, however. Single-motor helicopters can be operated at roughly half the cost, and create significantly less noise.

What is required in order to develop a product from the idea right through to series production? For Martin Stucki, engineering competence and the ability to perform a fundamental product definition are paramount. In Switzerland, manufacturing aircraft and aircraft components has a long tradition. With regard to competencies in the field of maintenance and servicing of rotary-wing aircraft, the country with the highest density of helicopters can rely on extensive experience and well-trained experts. In the highly sensitive aerospace industry, expertise relating to certification and validation is equally important. In this field, one has to deal with excessive bureaucracy and a tendency toward overregulation.

"All the regulations specified by EASA, the European Aviation Safety Agency, are implemented with Swiss thoroughness; a problem that we have to solve before it kills us," says Martin Stucki

Marenco's high-tech enterprises have their roots in the Stucki cidery in Pfäffikon in the Swiss canton of Zurich.

Marenco invested approximately half a million Swiss francs in two state-of-the-art Bystronic machines, a ByJet Flex waterjet cutting system with two 2D cutting heads and an Xpert 60 press brake. Cutting without creating heat in the material has proved to be a great advantage, because heat could change the material structure, which in turn would mean an increased risk of cracks. In combination with the bending machine, Marenco now has sheet metal processing facilities that offer an almost closed process chain for cutting and bending.

Christian Laube, head of Engineering at Marenco says: "Thanks to the new Bystronic machines, we were able to expand our competencies.

"This is a great benefit and creates independence and flexibility, also for time-critical small series, which often occur in the aircraft industry," says Christian Laube, head of Engineering.

The company cuts a wide variety of materials from soft to as hard as steel, from foam right through to titanium. With a pressure of up to 6,000 bars and using fine sand particles from the Australian desert as abrasive, the parts that are processed include copper conductor rails and sheet metal parts, such as switch panels or door lock components, but also foam inlays for cases to transport the sensitive material.

CNC operator Stephan Sauzet, who was already able to gain experience with a Bystronic prototype machine, praises the performance and precision of the new

acquisition. He processes workpieces that are 0.05 mm thick, which he reinforces with PVC, right through to the hardest and toughest precious metals, which the ByJet Flex also "cuts like butter." The accuracy of the cuts is 0.1 mm.

According to Stephan Sauzet, the real art is to take precise account of the kerf, in order to achieve exactly the specified dimensions.

"Thanks to the new Bystronic machines, we were able to expand our competencies and they make the company more attractive," adds Christian Laube. It is not least due to the investment that Marenco has been able to acquire new customers in the region.

Precision is a prerequisite and, thanks to Bystronic's machines, is perfectly achievable.

The challenge is to factor in the kerf precisely in order to achieve the given measurement exactly, as Stephan Sauzet knows, who is deeply concentrated on his work on a ByJet Flex here.

Martin Stucki founded Marenco Engineering. Five years later he first thought of producing a helicopter and started creating initial CAD drawings and a business plan. The initial idea was to build a small helicopter, but soon better market opportunities were seen for a six- to eight-seater in the 2.5-ton class. Since 2007, in addition to the engineering company, the former cidery is also home to Marenco Swisshelicopter AG, which has an additional production location in Mollis in the Swiss canton of Glarus. Some of the helicopter components are manufactured in-house at Marenco. Recently two brand-new Bystronic machines, a waterjet cutting system and a press brake, were installed in Pfäffikon and have since been providing valuable services.

The development of the Swiss helicopter focused fully on the question: What does the pilot need? Being a professional pilot, Martin Stucki wanted to produce a machine by pilots for pilots. Hence the cockpit is simple and user-friendly, and the main screens displaying all the important flight and turbine data, warning signals, while the moving-terrain display is positioned optimally.

Lightweight, agile, powerful and very economical due to its single-turbine configuration: With this profile and its attractive appearance, a mock-up already scored points at the Heli-Expo in the USA,

the most important trade fair for helicopters, resulting in numerous orders for Marenco.

As the first prototype quickly proved that the basic concept was good, and no significant changes were necessary, the second prototype that is currently being constructed is already very similar to the series model. Marenco already has commitments for 72 machines, which the company hopes to be able to start delivering to the first customers this year.

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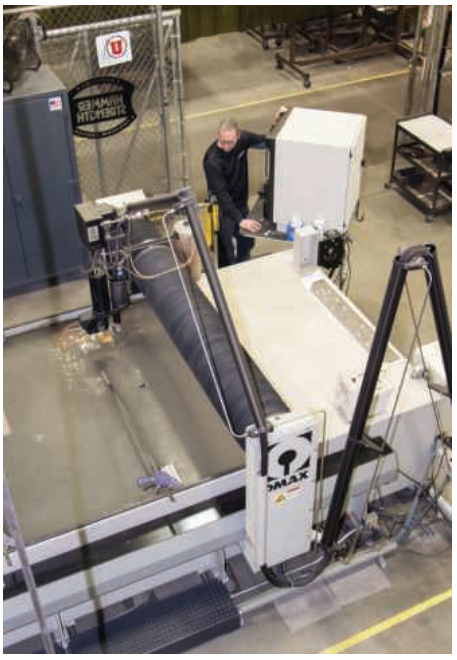
Waterjet cutting builds speed and agility

As a leading manufacturer of commercial and consumer cardio and strength equipment, Life Fitness depends on tradeshows for business growth and continued success. These events are where gym and fitness club owners, equipment dealers and other potential customers gather to evaluate and actually purchase products. So needless to say, new product development and production schedules at Life Fitness revolve around and are meticulously timed according to several key industry tradeshows for unveiling all its new units/pieces, systems and equipment.

Life Fitness has nine manufacturing plants globally, one of which is in Ramsey, Minnesota, where raw steel enters the 333,000 sq.ft. facility and completely finished products exit. With 500 employees, Ramsey is the biggest of the company's plants and runs three shifts/seven days per week. It develops and manufactures Life Fitness and Hammer Strength product lines as well as generates a majority of the weldments for the company's cardio equipment assembly plants.

The Ramsey facility ships about 50,000 finished "strength" products/units per year, and customisation is key to that line's popularity. The choice of features and options are virtually unlimited. Customers can get units in any color they desire, select from an array of upholstery types and stitching and opt for either standard or ergonomic handle styles.



Like many of the athletes who use its equipment, Life Fitness strives to build speed and agility, but in terms of its prototyping operations. The company must quickly respond to new demands and trends in fitness training with the continuous development of new and improved products, and do so ahead of the competition.

To keep pace design wise and work within its hectic tradeshow circuit, the Ramsey facility constantly evaluates the speed at which it builds prototypes. A critical part of those evaluations involves keeping abreast of advanced machining technology and determining if it could, in fact, help the facility's prototyping shop go from concepts to testable prototypes faster. Most recently, such an evaluation resulted in the incorporation of high performance abrasive waterjet cutting capability.

The Ramsey facility's prototype shop installed an OMAX 60120 JetMachining Center from OMAX Corporation. Unlike the shop's previous plasma cutting systems limited to only metal, the OMAX 60120 cost-effectively processes all the different materials that Life Fitness works with while also providing quick and easy programming, simple setups and short job changeover time, as well as blazing fast part cutting.

With this increased machining speed, the shop is now able to handle almost all of its prototype part production in house to avoid having to deal with outside suppliers and their fluctuating schedules. Abrasive waterjet cutting also eliminates the need for any secondary slag clean-up milling operations required after plasma cutting a part.

The OMAX 60120 is a bridge-style abrasive waterjet machine with a work envelope that offers an X-Y cutting travel of 10' 6" x 5' 2" (3,200 mm x 1,575 mm). The machine features OMAX's Intelli-TRAX® high-precision linear drive technology

designed exclusively for the abrasive waterjet environment, a Bulk Abrasive Delivery System and an extremely durable OMAX MAXJET®5i Nozzle.

Equipped with an A-Jet cutting head accessary, the OMAX 60120 delivers repeatable, high precision, detailed 5-axis cutting. Such capability allows Life Fitness to cut weld bevels and do other prep work, operations that were previously impossible with its plasma equipment. The A-Jet cuts beveled edges up to 60 degrees at angles determined by the machine operator or by the part program. The head features a compact design and delivers a positioning accuracy of ± 0.09 degrees (± 6 arc minutes).

According to Westin Nelson, senior program manager for the commercial strength division at Life Fitness, the OMAX 60120 produces complete show-quality prototype parts the first time. Doing so, it eliminates any need for secondary weld-prep operations or those required to make parts aesthetically pleasing. The machine not only cuts part shapes/profiles, but also their other features such as holes and slots needed for assembly. Parts are so precise in terms of feature dimension and location that assembly operations go quicker and easier because individual parts line up with one another perfectly and without extra effort or rework.

"Before the OMAX, our prototype area was more like a blacksmith shop," he says.

"It was dirty with dust and slag on the floor from plasma cutting. We would cut parts and end up having to mill and grind the slag from the rough cut edges to make them presentable. On top of this, we had to go back again and add the other features."

The speed and agility of the OMAX abrasive waterjet system also makes for faster prototype part iterations. If Life Fitness needs to tweak a design, make a part and/or feature a bit longer or shorter or change it somehow, it can in a matter of minutes. Plasma cutting, on the other hand, typically involved a 24-hour turnaround time.

Shorter job changeover times are another key benefit of the OMAX machine. Life Fitness quickly transitions from cutting one type of part to the next, and Nelson indicated that the machine's extremely fast and easy programming contributes significantly to that fact.

"Before our waterjet, we lacked the production capability to quickly, economically or easily produce custom signage and other personalized details," continues Weston Nelson. "Now, customers send us an AI or .eps file of the logo they want, we import it to the OMAX software and run it."

Besides prototyping and custom signage, Life Fitness also cuts a lot of welding jigs and fixtures on its 60120. Every product the Ramsey facility produces involves, on average, six fixtures. And because the shop is so vertically integrated, it produces all of them in house, including those cut from 2" thick aluminum plate for robot welding operations.

Most other parts cut on the OMAX are aluminum and steel in thicknesses that range from 0.06" to 1.5". Most parts are cut from large 4' by 8' sheets, and the shop uses the OMAX nesting software to conserve material.

"We looked at five waterjet suppliers along with OMAX," comments Westin Nelson. "We evaluated every aspect including training, warranties, software costs, pump technology, time between pump rebuilds and machine installation requirements. Mistakenly, we assumed all the abrasive waterjet technology on the market was comparable. But we soon found out that OMAX far exceeded its competitors not only in advanced technology but also training, software and application support."

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Waterjet cutting systems - made in Germany

WARICUT waterjet cutting systems are an insider tip for the purchaser looking for quality products. H.G. Ridder Automatisierungs-GmbH, founded in 1980 in Hamm in Westfalia, Germany, has manufactured high quality waterjet cutting systems under the brand name WARICUT since 1991. WARICUT systems are designed completely modular and available in various types, but are always consistent with regard to quality, precision and reliability.

Focusing on these typical properties for good mechanical engineering is the result of Ridders's prior core business, machine tool overhauling, which is still a division today. H.G. Ridder started in the 1980s with mechanical and electrical machine tool overhaul. Some of the overhauled turning machines, vertical lathes or milling machines have impressive total weights over 500 tons, for example a vertical lathe with a turning table diameter of over 8 m for a customer in South Africa.

This experience was the basis for the design of Ridder's first own waterjet cutting machine. The excellent workmanship explains why Ridder's waterjet systems are so reliable. "We have machines on the market with over 100,000 operating hours and all delivered machines are still in operation today." says H.G. Ridder, president of H.G.Ridder.

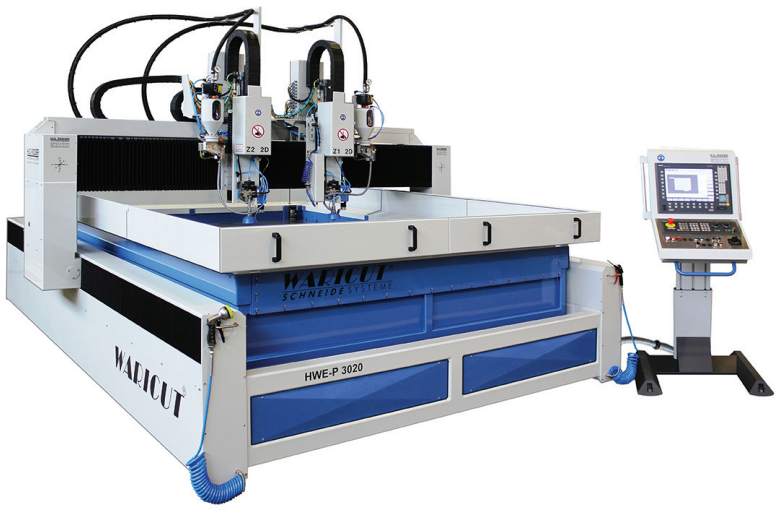
WARICUT machines leave the company with three years guarantee without any limit of operating hours. High availability is a very important and convincing argument, especially for customers using their machines in three shift operation

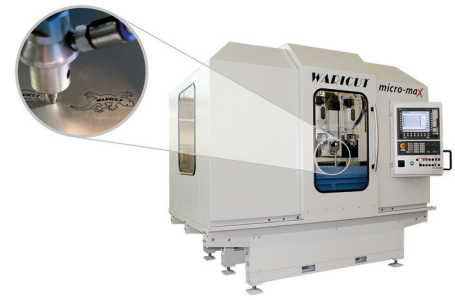
The company's motto "everything from a single source" expresses this reliability and persistence from a family business with almost 70 employees. From its departments for engineering and electrical engineering to production with welding shop, CNC turning, milling and grinding, paint shop, control systems and final assembly through to support and spare parts service, everything is offered directly to customers from H.G.Ridders's 6,000 m² works in Hamm.

Notably the aftersales service and professional assistance for WARICUT customers is a very important aspect for the company. No customer needs a golden or premium service contract for support. From the first delivery of a WARICUT, the support by phone or remote service is completely free.

The design of WARICUT waterjet cutting machines is also clearly different to nearly all other available waterjet machines on the market. One of the most important aspects is the mechanical separation of machine frame and cutting basin. Only in this way is it possible for the precision of the machine to not be affected by the high application of energy of the waterjet. The impact through high water temperature on machines with gantry system mounted directly at the water basin is remarkable. A further essential advantage of the separate design is that the load of the heaviest components has no effect on the gantry over the machine.

All WARICUT machine frames and gantry axes are welded with heavy and torsion-free steel box section profiles. After

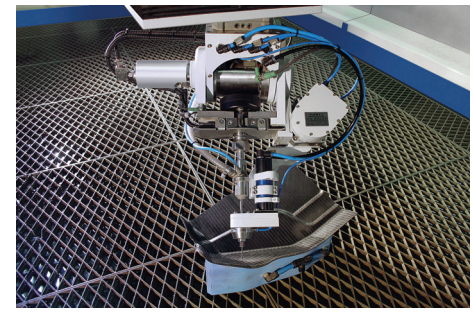




stress-relieving of these axes, parts milling, grinding and scraping follows.

On this stable basis, the precision guideways and fixed ballscrew spindles are assembled. Power is provided by rotating ball screw nuts with three-phase servomotors. A positioning accuracy of less than +/- 20 µm/m is guaranteed for all WARICUT machines. For micro-cutting machines of the WARICUT micro-max, this is less than 5 µm/m.

The cutting basin is also made with the same care as all other components. They are made of stainless steel, something that nowadays is no longer standard. Many



manufacturers use mild steel, aluminum or plastic material. All these materials are basically cheap, but in order to avoid much reduced permanency, it is better not to use them. Perforation corrosion and penetration of the basin floor are not unusual with such materials.

The functionality of a WARICUT waterjet solely depends on technical feasibility and the customer's request. Starting with a single 2D cutting head with 200 mm Z-axis stroke to multiple cutting head machines with 2D and/or 3D functionality and over 2,000 mm Z-axis stroke, everything is possible, whether it is pure water, abrasive or micro cutting technology, 4,000 or 6,000 bar cut pressure. All waterjet machines are completely modular designed and technical upgrades are always possible, for example, from 4,000 bar to 6,000 bar, from a 2D

cutting head to 3D cutting head, 2D or 3D drill axis (for carbon fibre), 3D measuring probe, waterjet stripping and milling, etc. 6,000 bar technology has been available as a standard option since 2004.

Only a few components of the WARICUT systems are purchased parts, for example the SIEMENS SINUMERIK 840D sl controller or the Bosch REXROTH linear guideways and ballscrews spindles. Since manufacturing the first waterjet in 1991, SIEMENS has been the controller supplier for all WARICUT machines.

Only with a SIEMENS 840D controller could Ridder produce and supply the first fully interpolated 5-axis waterjet cutting machine to the Mercedes Benz Armoured Car Division in 1997. In 2016, technical advances can be demonstrated by the first WARICUT machine with three fully interpolated 3D cutting heads again for armoured parts production.

Another benefit of these controllers is the guaranteed availability of spare parts for a minimum of 10 years. Today, it is possible to support and deliver all required replacement parts for controllers and machines.

PLC and HMI programming, including easily operated waterjet control software, is also done in house, while special purpose functions are always possible.

Depending on this high in-house production expertise, Ridder is able to produce individual standard machines up to complex special purpose machines.

High precision micro abrasive cutting machines belong to this portfolio as well as typical 2D or 3D contract cutting machines for standard sheet metal formats.

A few years ago Ridder installed one of the biggest WARICUT machines with a cutting area of 32 m x 5 m with two separate bridges, each with a 5-axis head and 2 m Z-axis stroke, all inside an acoustic booth.

Continuous developments of new functions keep Ridders's waterjets always up to date. H.G. Ridder concludes: "The quality of our machines speaks for itself and the endurance and reliability makes them the most economic and efficient ones compared to competitors' systems. Just ask an owner of a WARICUT."

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Flow in the spotlight

How2Media has announced that Flow International Corporation will be part of its "World's Greatest!..." series

Flow International Corporation, the world leading developer and manufacturer of ultrahigh-pressure waterjet machines for cutting applications, and How2Media, the producers of the television show "World's Greatest!...", have announced that Flow International Corporation has been selected to be a part of the popular television series.

"Flow International Corporation was founded in 1974 and is the world's leading provider of waterjet systems," says Gordon Freeman, executive producer of the show. "Flow provides turnkey solutions, components, and comprehensive support of both the pure waterjet and abrasive waterjet variety across its globally diverse customer base. Pure waterjets cut food, gasket, foam, plastic, paper, disposable diapers, automotive interiors and other soft materials. In the 1980's Flow invented the abrasive waterjet, thereby increasing the cutting power of the pure waterjet thousands of times, to help manufacturers cut any hard material, such as metals, glass,

composites, ceramics and stone, even over 1 foot thick. We think their story will be meaningful as well as extremely educational to our viewers."

As part of the show, How2Media sent a film crew to spend time at the company's manufacturing facilities and corporate headquarters in Kent, Washington, just outside Seattle, to find out what the story behind the story is with this great and dynamic company and to show the "World's Greatest!..." viewers why Flow International was selected as the best in its category, and therefore featured on the show.

"World's Greatest!..." is a thirty minute show dedicated to highlighting the world's greatest companies, products, places, and people. Each show is a fast paced tour around the world featuring behind the scenes footage, informative interviews, and exciting visuals.

The "World's Greatest!..." episode 229 will be airing on DirecTV channel 305 as well as Dish Network channel 250. To find the episode with your cable channel provider, please visit: **http://worldsgreatest television.com/tv_schedule/ and follow the prompts - About How2Media**

Flow International Corporation, a Shape Technologies Group company, is a leading ultrahigh-pressure manufacturing process solution provider.

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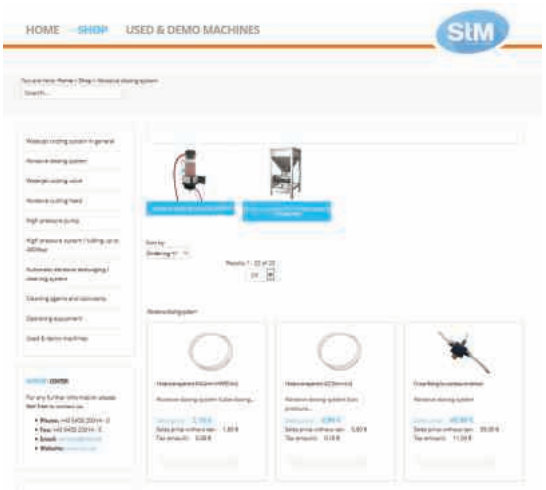
Efficient waterjet cutting - the big difference lies in the smaller details

Waterjet cutting is one of the fastest growing industrial manufacturing processes. In particular, the wide-variety of areas of application, the easy handling and the maximisation of effectiveness are convincing arguments for users in all branches of industry. STM provides its customers with numerous detailed solutions that enable them to manufacture even more profitably.

At STM Stein Moser GmbH, waterjet cutting has method and tradition. The Austrian company started series production of its own equipment as long as 27 years ago. From the beginning, its objective was to provide customers with custom-made economical manufacturing solutions together with a standard quality and first-class service. Having successfully achieved these goals, STM is now one of the world's leading waterjet cutting specialists. The secret behind this success story is that STM works hand in hand with its customers and partners to continuously improve efficiency.

Unlike other manufacturers, STM concentrates on waterjet plant designs with no bellows. The standard water-protected linear guide is consequently easy to clean, exhibits a superior protective effect, is capable of many years of use and considerably improves the appearance of the equipment. As a result of the robust rack and pinion drive, the durability of the machines is extended even further. The low consumption of compressed air for operating the plant is also a factor which keeps operating costs for a waterjet plant from STM extremely low. In addition to a completely rust-proof lightweight design in a combination of aluminium and stainless steel, the STM system provides a combination of first-class components, plus maximum production-related efficiency, environmental friendliness and wear resistance. The cutting tank with its exchangeable workpiece holders is designed for operation with abrasive waterjets. The water level in the cutting tank is adjustable.

As well as technical efficiency and an individual consulting service, the company places great importance on flexible functionality: Machines are adapted technically to exact requirements, so customers do not have to take any unnecessary extras but nonetheless still retain flexibility. This is because even entry-level models can be upgraded as required thus allowing changing requirements to be adapted to quickly and reliably. To this end the versatility of the modular system with its cutting tables and accessories of all kinds makes a decisive contribution. Moreover, the user-friendly, low-maintenance design of the systems offers resource-efficient manufacturing and an all-round convincing price-performance ratio. Dependent upon individual requirements, various tuning options are available. These include an automatic height sensor with collision protection, vacuum monitoring in the abrasive dosing unit as well as the possibility of operating several cutting heads simultaneously. STM presents the whole spectrum of relevant options from pipe cutting module through OneClean water cycle system, tailored to individual requirements.



With an attractive price-performance ratio, great ease-of-use as well as high wear resistance, ease-of-maintenance and efficiency, the compact portal systems means that even small and medium-sized companies can make use of this rapidly growing tool technology. Moreover, thanks to intensive research in cooperation with well-known institutions, STM guarantees continuity, not just organisationally but technologically too. Furthermore, a mature network of suppliers and sales partners provides a working relationship which is as close as it is reliable.

Through continuous consultancy, training, and a comprehensive spare parts and maintenance service, STM ensures that the manufacturing processes of its customers remain optimally profitable in the long term. In this way, STM supports its customers, from technical advice, business planning, sample calculation, through the planning of complete systems, test methods, shipping and sales training to the procurement of subcontract orders.

To secure the best provision of spare parts for a growing number of customers from every conceivable country, STM has established an extensive online shop. Here users can find the most popular accessories and wear parts as well as consumables for sale. In addition, used cutting systems are now available from www.waterjet-shop.com or by visiting www.stm.at. All products are presented with an image, all equipment features, delivery time and price in euros. Purchasers can register within minutes and order on account with no risky data transfers. Only new customers have to pay in advance. All online customers benefit in from a general 3 percent online discount as well as regular promotions. The shop is available in German and English.

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Jet Edge showcases latest 5-axis waterjet cutting system

Waterjet manufacturer to perform live waterjet cutting demonstrations, as well as showing the latest waterjet pumps and closed loop water recycling

Jet Edge, Inc., a leading manufacturer of ultra-high pressure waterjet technology, is bringing its latest precision waterjet cutting technology to FABTECH, from November 16th to 18th in Las Vegas, **Booth C25085**. During the show, Jet Edge will perform live 5-axis abrasive waterjet cutting demonstrations on its X-Stream-powered EDGE X-5® 5-axis waterjet. It will also introduce its new Permalign® V-Series Mini Hopper and show its premiere 75,000 psi 5,200 bar X-Stream® pressure intensifier pumps and Closed Loop Water Filtration System.

EDGE X-5 5-axis waterjet

Jet Edge's EDGE X-5 5-axis waterjet cuts precise taper-free parts from virtually any material. The system is capable of cutting sophisticated 3D parts such as impellers and bevels up to 50°. This workhorse system is designed to provide years of dependable service in harsh industrial environments. Its sturdy design separates the motion system from the catcher tank, eliminating vibration and ensuring maximum part quality. The ball screw-driven system features direct-couple AC brushless digital servo motors, providing the best repeatability in the industry at +/- .001". Critical bearing components are protected with heavy metal covers with brush seals and positive air pressure. Productivity enhancing options include a second cutting head with mirror cutting capabilities, a pneumatic drill for pre-piercing materials that are prone to delamination, automatic submerged or above-water cutting capabilities, and a proprietary laser plate mapping feature that allows precise nozzle-to-plate standoff. The EDGE X-5 features Jet Edge's Aquavision® Di industrial PC, which gives operators the freedom to fine-tune programs from any CAD/CAM/nesting software, utilising advanced HMI features and/or standard G&M code. The EDGE X-5 waterjet machine is available in many sizes, from 5' x 5' (1,500 mm x 1,500 mm) to 24' x 13.' (7,300 mm x 3,900 mm).

Permalign V-Series Mini Hopper

Jet Edge's new variable aperture Permalign V-Series Mini Hopper increases abrasive waterjet cutting productivity and profitability by allowing waterjet operators to easily make adjustments to abrasive flow, minimising abrasive consumption. The Permalign V-Series Mini Hopper's water resistant design helps prevent annoying abrasive clogs that can cause stoppages and scrap out expensive material. Built for the harsh abrasive jet environment, the Mini Hopper does not require an enclosure, allowing for much cleaner operation. It is infinitely adjustable between 0.10 pounds per minute to two pounds per minute and features improved venting of excess abrasive.

Jet Edge X-Stream Waterjet Intensifier Pump

Jet Edge's 100 hp 75 kW X-Stream® xP90-100 waterjet intensifier pump supports 75 KSI (5200 bar) continuous operating pressure. The X-Stream achieves much faster cutting speeds and drastically lowers operating costs compared to traditional 60 KSI (4,100 bar) water jet pumps, enabling users to increase productivity and reduce part costs. The X-Stream produces 50 percent more pressure than a 60 KSI (4,100 bar) intensifier pump, resulting in a 40-50 percent increase in productivity for many materials. Compared to a 60 KSI (4,100 bar) pump, typical operating pressures of 75 KSI (5,200 bar) use 30 percent less water, 30 percent less power, and up to 50 percent less abrasive, resulting in a 40 percent reduction in operating costs. The xP90-100 is capable of producing flow rates of 1.45 gpm (5.49 L/m) and supports up to a .017" (.43 mm) orifice. Fittings and tubing are rated for 100 KSI (6,900 bar). The X-Stream also is available in a 50 hp (37 kW) model.

Jet Edge offers the widest range of waterjet pumps in the industry. Its pumps include hydraulic intensifier pumps and direct drive pumps. 36KSI (2,500 bar), 60 KSI (4,100 bar) and 75 KSI (5,200 bar) models are available from 30-280hp (22-208kw). Electric and diesel models are available.

Waterjet Closed Loop Water Filtration System

A must in desert locations like Las Vegas, Jet Edge's Waterjet Closed Loop Filtration System filters and reuses the waterjet cutting water and pump cooling water, reducing water consumption as much as 90 percent. In addition to lowering water and sewage cost, the system eliminates the need for a drain and prevents the introduction of hazardous materials into drainage systems. By filtering the water, the system also protects the waterjet pump and maximises orifice life. Closed Loop Filtration Systems are required for ISO-9000 certification.

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Automated storage and retrieval of steel streamlines stockholder's business

High-performance engineering steel is stored safely and picked more efficiently at Oldbury-based Bohler-Uddeholm (UK) since it invested £3 million in an automated KASTOunicompact warehouse and a further £1 million in other site improvements. The computer-controlled storage and retrieval system became operational in the first quarter of 2016, having been systematically populated with bar, tube and other long stock that was previously held in conventional cantilever racking.

The immediate and future benefits are far-reaching. The number of forklift trucks on site has been cut from 15 to 6, reducing overheads, making the working environment safer for personnel and cutting diesel emissions. In addition, warehouse operator costs have been lowered by 15 percent, with personnel redeployed to other duties.

There has been an 80 percent saving in floor area. The KASTO store has a 1,000 m^2 footprint, whereas previously 5,500 m^2 was required to stock 2,600 tonnes of material, although the new tower can easily hold double that amount. The freed floor space will be used to increase the number of bandsaws, machining centres and grinders to allow Bohler-Uddeholm UK to carry out more added-value processing.

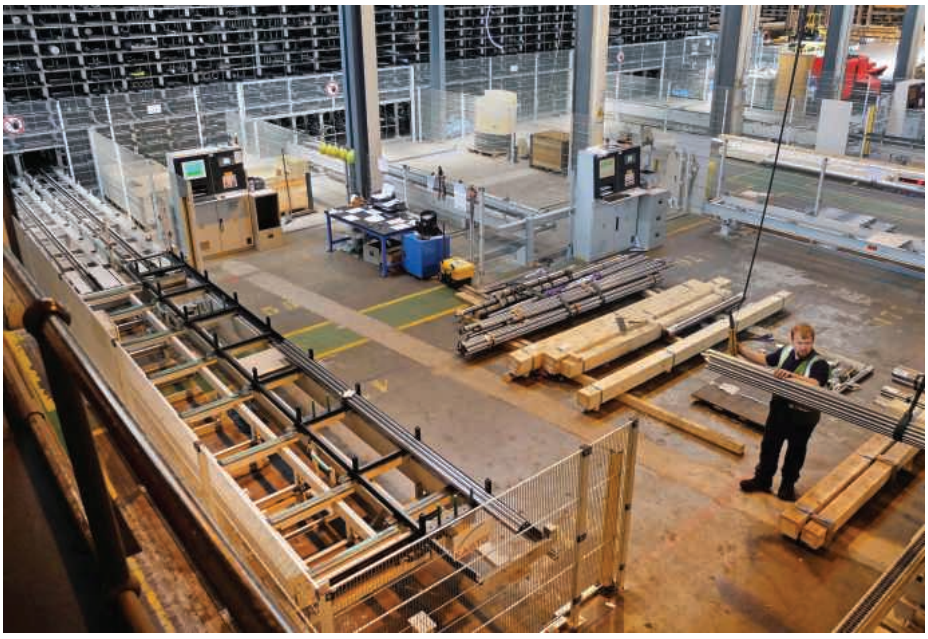
Managing director Tom Gowans says: "The automated warehouse has already started to raise our competitiveness and will underpin our planned 50 percent growth in throughput by 2020, increasing turnover from £50 million to £75 million.

"It will also benefit our customers, as we can now ensure same-day picking and despatch for all orders received before noon. In the past, during busy periods, we could not guarantee that. Average lead-time has consequently halved to one-and-a-half days.

"The operational savings from investing in the automated warehouse will be further increased by moving from 24/5 working to a double shift pattern later this year when the new system has bedded in.

"Taking all of the economies into account, return on investment will be within three to five years, depending on the business climate and in particular a recovery in the oil and gas sector, which is an important part of our business."

Bohler-Uddeholm is part of the special steel division of voestalpine Stahl AG, which owns specialised mills in Austria, Germany, Sweden and Brazil producing cold and hot work steels, mould and tool steels, high speed steels and various alloys including nickel-based varieties.



The KASTOunicompact 3.5 at Oldbury is the sixth bespoke warehouse manufactured by KASTO in Germany for Bohler-Uddeholm group distribution centres worldwide. The 37-metre long store contains 2,377 travelling cassettes capable of holding steel bars and tubes up to eight metres long to a maximum weight per location of 3.5 tonnes. Useable width of the cassettes is 620 mm and there are three height variants of 180 mm, 220 mm and 450 mm.

The automated storage and retrieval facility is 15 metres high and has been built onto the end of the original warehouse at Oldbury, which is nine metres high. Exterior parts of the extension have weatherproof cladding, including a 26 metre long end wall and the four sides of the tower that are above the nine-metre roof line.

An integrated, overhead gantry crane feeds 12 cassette buffer stations, where operators put material away into store and pick orders. Some material is transferred to 17 automatic bandsaws and on to other machine tools, all of which are now close to the store. Previously, material on racking had to be found by the picker and moved through two bays by lift truck for processing. It entailed significant operational cost disadvantages, health & safety risks associated with manual material movement and potential delays in supplying customers.

The storage system delivers and returns up to 45 cassettes per hour containing a mix of 4,500 line items of engineering steel between eight and two metres long. (shorter sections are held in two 9.5 m lean lift towers nearby.)

The picking crane has a double cycle

capability, picking a new order and returning the previous cassette to the free location, ensuring fast and dynamic delivery. The warehouse is particularly energy efficient, as it does not need lighting or heating, added to which energy recovery and power storage on the downward travel of the picking crane is a standard feature of KASTO warehouse designs.

The KASTOlogic warehouse control system with ID and password access has been interfaced with the stockholder's SAP administration and inventory system, which includes Idox information management software. It has created a largely paperless working environment, with inventory management and 100 percent material traceability provided from material purchase to sale. Data input to the system is via barcodes or numeric product coding, or by length and / or weight of material.

Mike Hickman, operations manager at Bohler-Uddeholm (UK) says: "Throughout the installation of the automated warehouse, the inter-company co-operation between us and KASTO in mechanical design, bespoke IT solutions, installation, training and back up has been excellent."

Tom Gowans says: "Part of the strategy for this project was to achieve a culture change within our company and to bring our four divisions closer, with the strapline 'Work Together to Grow Together'.

"This also perfectly describes the strengthening relationship between our management and operational staff and the KASTO implementation teams both in the UK and Germany."

As a footnote, Ernst Wagner, managing director of KASTO in Milton Keynes says: "All our products, including sawing machines as well as storage systems, are built in-house by us in our two German factories, ensuring on-time, accurate, trouble-free turnkey handover.

"We have installed around 1,750 systems worldwide in the warehousing sector over the last 25 years and it is noteworthy that they have been bought by around 650 customers. In other words, once a company buys such a system, they often go on to buy two, three, four or more, as the benefits become clear very quickly.

"Particularly in the UK, where land and building costs are high, the benefits of 3D storage in towers are massive, freeing up areas for other activities and perhaps even avoiding or delaying the need for the user to relocate. Overlaid on these advantages is a reduction in operational costs through improved logistics."

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Prima 'powers' Acorn Laser to productivity

Since the company commenced trading in 1999, Acorn Laser Ltd has earned an excellent reputation for the quality of its output, its cost effective pricing policy and for providing a reliable service to its customers. From humble beginnings, operating from a small unit with a single laser-profiling machine, Acorn Laser now has the North East of England's largest laser cutting capacity.

Prompted by ever increasing customer demand, over the last 17 years the ISO9001:2008 accredited company has continually increased its staffing levels and expanded its range of metalworking capabilities. Acorn Laser now boasts an extensive range of state-of-the art sheet metal processing equipment housed in its 36,000 sq ft. Washington, Tyne and Wear based production facility. Sectors currently served include the demanding automotive, off-shore and marine, rail, earth moving equipment and electronics industries.

A growing order book, and the need to increase the company's press brake capacity, recently prompted a search for a machine that would help relieve the pressure on the company's existing press brakes.

Acorn Laser director, Graeme Deanus explains: "We provide a wide range of metalwork services and supply high quality finished products to our customers throughout the UK and beyond. Whether our customers require design, development, prototyping or low to high or volume production, we can help at every stage, from the initial enquiry, through to manufacture.

"In addition to laser cutting, our experienced team provide a complete range of design, development, prototyping and metalwork processes, including 3D CAD, punching, CNC bending, multiple welding techniques and assembly. We also offer a wide range of coating and finishing processes.

"We recently identified the need for a larger press brake that would increase our size capacity, give us a faster bending throughput and allow us to further develop our capabilities in this critical area. In addition, as we pride ourselves in our ability to deliver the highest standard of fabrications at a cost effective price, we wanted a rapid action machine that could deliver the required standards of quality.

"Even though we have several Prima Powers laser cutting machines, including, a Platino CP4000, a Platino CP3000, a Platino PRC, Platino Rofin-Sinar and a Platino Fibre 4 kW, and have found each of them to be very reliable, highly productive and able to turn out high quality work, in addition to considering the latest Prima Power bending technologies, we also looked at the offerings from several other leading manufacturers.

"Although a couple of the machines we viewed had some of the features we were looking for, the eP1030 from Prima Power, with a length capacity of 3060 mm and a press specification 105 tons, proved to be the most comprehensive package and represented the ideal bending solution for our specific needs.

"Now fully operational, our new press brake is delivering on all of the promises made by the staff of Prima Power UK. The eP1030 is providing excellent levels of production of high quality parts, it has enabled us to accommodate larger fabrications, and has also helped us to further expand our bending capabilities."

Prima Power provides a most comprehensive range of sheet metal fabrication machines and systems. The company's high quality products cover every stage of sheet metal working, including: laser cutting, welding and drilling, punching, combined punch/shear and punch/laser, bending, automation, and software.

True to the company's all-embracing philosophy, Prima Power offers a complete range of bending solutions with automation levels to meet all customers' requirements.

The highly efficient eP Series is based on Prima Power's extensive experience in press brake design and manufacturing and the company's expert knowledge of servo electric technology for use on sheet metal working applications. On average this advanced servo-electric bending solution delivers 30 percent shorter cycle times in addition to reduced setup times.

The innovative four model, eP-0520, eP1030, eP-1336 and eP2040, series covers various press tonnages and bending lengths and share an advanced machine concept that provides enhanced productivity, accuracy, flexibility and reliability.

In addition to reducing users' running costs and increasing their profitability, the eP series' reduced power consumption, on average, 50 percent lower than hydraulic brakes, the machines' need for less maintenance and the absences of oil to purchase and dispose of, brings many ecological advantages. Prima Power call this concept Green Means®.

Prima Power's eP Series' pulley-belt system, actuated by Prima Electro servo-drives, distributes the applied bending force over the whole bending length, whilst a rigid and stable O-frame ensures tool alignment even under stress deformation. Excellent ram position accuracy and repeatability is assured by

bed-referenced linear encoders that measure upper and lower beam relative positions. Typical of advantageous C-frame structures, eP Series machines have no throat limitations for longer parts.

Block Laser safety equipment is provided by Lazer Safe, the most advanced solution in terms of productivity and protection levels. Whilst AQ-bending followers remove the need of a second operator for supporting big parts

High speed digital image processing technology is also available enabling the precise measurement of formed workpieces angles on every cycle and automatic correction of bend programs.

Prima Power is a leading specialist in machines and systems for sheet metal working. Its offering in this field is one of the widest and covers all applications: laser processing, punching, shearing, bending, automation.

The company's manufacturing facilities are in Italy, Finland, USA and China, from which machines and systems are delivered all over the world. The sales and service network is active in over 80 countries, with direct presence or through a network of specialised dealers.

With product lines ThePUNCH, TheLASER, TheCOMBI, TheBEND, TheSYSTEM and TheSOFTWARE Prima Power cover all stages of the sheet metal working process.

The family of highly advanced servo-electric solutions for punching, bending and integrated processes is the widest in the world, marketed under the slogan "Energy in Efficient Use".

Services are an important part of Prima Power activities and are meant to give a professional, dedicated and effective support to customers all over the world.

All company products are developed according to the "Green Means" concept, combining sustainability and productivity.

Prima Power is the Machinery Division of Prima Industrie Group, listed on Milan's Stock Exchange.

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Automated press brake reduces labour costs and slashes setup times

Recol Engineering Ltd, a Northampton-based subcontract supplier of complete metal-based manufacturing solutions, has become the UK's first user of Amada's new HG ARs automated press brake system. The adoption of robot-tended bending operations is not only providing a reduction in labour costs for this forward-thinking manufacturer, but thanks to the system's integral automatic tool changer (ATC), has cut setup times from 45 minutes to just 90 seconds in some instances.

Privately owned with 85 employees, Recol is currently enjoying a period of year-on-year growth. For instance, the company's 36,000 ft² fabrication facility has recently been supplemented by a 12,000 ft² machining unit. Moreover, Recol's continuous programme of ongoing investment in the latest manufacturing technologies has never been healthier, as evidenced by the company's commitment to automating its press braking operations.

Director Ben Guntrip, son of the company's founder Rhid, says: "Labour is the biggest cost to any business like ours, and we knew that introducing automation into our bending operations would deliver significant gains.''

Recol has been a user of Amada technology since it was established nearly 40 years ago. Today, the company has an array of Amada machines, including an LC3015F1 CNC profiling centre with material tower and an ACIES CNC punch/laser combination machine with load/unload automation.

Ben Guntrip says: "We had automated other aspects of our process chain with great success, so bending seemed a natural progression. Amada have never given us a reason to look elsewhere, so when we heard about the HG ARs at EuroBlech 2014, we were keen to learn more."

The HG ARs is a fully integrated robotic press brake system with a six-axis robot, automatic gripper changer (AGC) and ATC with patented Amada tooling. Each stage of the bending process, including tool loading, gripper exchange and robotic bending, is performed at fast speeds to maintain high levels of unmanned machine productivity. It supports workpieces up to 1,000 x 800 mm, with a weight capacity of 20 kg. Recol's trip to EuroBlech was followed by a visit to Amada's European robot technical centre in Italy, which had a working prototype of the HG ARs. Ben Guntrip took along a few jobs and the automated press brake system performed extremely well considering the short amount of time available.

The order for the system was cemented in July 2015, when the team was invited to Amada Japan. Here, the company challenged the machine with some of its most complex jobs.

Ben Guntrip says: "Not only did the automated system perform really well, but we were taken to see one of the first users in Japan. Interestingly they had migrated from the previous Amada automated press brake system, the Astro, and strongly preferred the new HG ARs."

Duly installed in February 2016, the machine has been set to work producing a range of different components, some of which are extremely complex, for industries that include telecommunications, construction, food and pharmaceuticals.

Ben Guntrip says: "With the HG ARs the operator simply pushes the button and walks away to start doing other things, such as programming new jobs. We have already started using the HG ARs overnight, unattended. Ultimately it has changed the way we do things, as well as the way we quote. Taking labour out of the equation through automation is the only way to level the playing field."

The 6-axis robot offers a wide range of motion capabilities to perform all part loading, bending and unloading operations. What's more, during bending, a potentiometer back-gauge system with additional side gauge compensates for any deviation when the workpiece is placed in the die. This ensures that parts are produced consistently with maximum accuracy.

Batch sizes at Recol are mid-range, typically from 10 to 1,000-off. With this in mind, the system had to offer sufficient flexibility in terms of minimising setup times when changing from one job to another.

Ben Guntrip says: "With the ATC we can change jobs really quickly. For instance, setting up one of our manual press brakes for a complex bending job can take 45 minutes. However, this is reduced to around 90 seconds using the HG ARs. Differences of such magnitude are game-changers."

Amada's ATC ensures that tools are

loaded quickly and precisely. Four tool manipulators quickly load tooling from 15 punch stockers and 18 die stockers. Each stocker can hold 800 mm in tooling, which brings the ATC's tool capacity to over 26.2 m.

Further process flexibility is imparted by the machine's 8 m rail, the first of its type in Europe, which allows Recol to have more loading stations, and hence more jobs in progress.

Ben Guntrip says: "It's a hungry machine that's for sure. Indeed, we are now actively seeking more work to help fill its capacity. If we can achieve this we will shorten our ROI and look at investing in another, possibly the smaller version."

The Recol vision has always been that of high quality goods with manufacturing flexibility and excellent customer service. To this end, the company places strong emphasis on its programme of reinvestment in the very latest technology developments. Recol believes that this forward-looking approach has secured its place within a very competitive market, and helped gain a strong and diverse customer base within the UK and Europe.

Ben Guntrip concludes: "Customers today want more than simply a good price, they want a package that comprises right-first-time, on-time, good quality product and the same next time. They want a partnership based on added value solutions, which is where we excel. We work with our customers to help develop parts that are suited to the manufacturing technologies available, passing on any resulting savings. This proactive stance has helped us retain some customers for over 30 years. Indeed, with regard to the HG ARs, we've had customers come in to see what jobs might possibly lend themselves to our new investment. For us, this signifies that we have made the right decision."

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40 percent longer sawblade life

Dynashape provides real benefits for Metsec
Dynashape, the UK's most experienced sawblade servicing and manufacturing specialist, has secured a new 12-month contract with Britain's largest specialist cold roll-forming company, voestalpine Metsec plc. The contract is for the supply of TIALN-coated SHSS (Super High Speed Steel) and TCT (Tungsten Carbide Tipped) sawblades, as well as for sawblade remanufacturing.

900 more cuts per new blade
"This will be the second year that we have provided sawblade services for Metsec," comments Dynashape's managing director, Chris Parkes, "and I am absolutely delighted that the team at Metsec has chosen to appoint us again. When we first won the business in 2015, we demonstrated how our sawblades were capable of delivering in the region of 3,000 cuts per blade. That's around 900 more cuts per blade than Metsec was achieving using a competitor's products. More importantly, it underlines the true cost-effectiveness of the improved sawblade technology that is employed by Dynashape."

Remanufacturing blades to perform like new
Providing Metsec with sawblades that have a much longer life, however, is only part of the story. Dynashape's considerable investment in the latest CNC sawblade manufacturing technologies, the same machinery that is used by leading sawblade producers globally, means that it is also able to remanufacture Metsec's blunt blades to 'as new' standards.

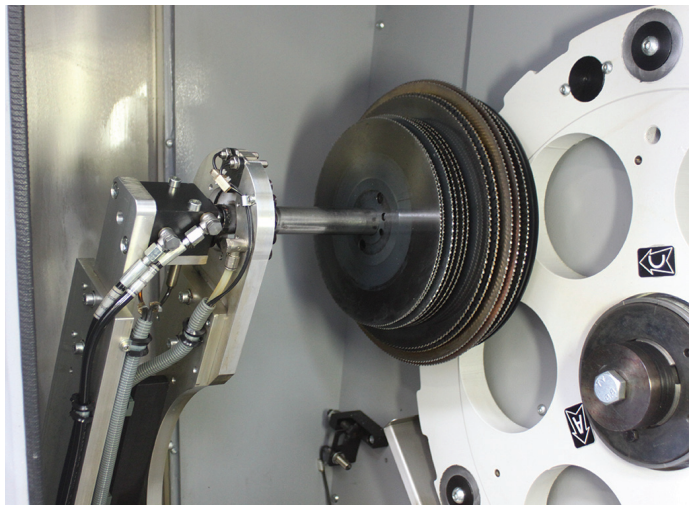
"We presently remanufacture some 20 to 30 SHSS sawblades each week for Metsec," adds Dynashape sales engineer, Richard Meacham. "Depending on usage, blades can typically be remanufactured up to twelve times, and all for a fraction of the cost of buying new."

TCT and SHSS blades for Metsec's roll-formed solutions
Metsec specialises in providing the highest quality cold roll-formed solutions. These include purlins and side rails, lightweight steel framing, dry lining and cable management solutions, for the construction industry, as well as custom roll forming and profile manipulation for a wide range of market sectors including construction machinery, transport, office furniture and energy.

Dynashape supplies sawblades to both the Custom Roll Forming (CRF) and Profile Manipulation (MPM) areas at Metsec's Oldbury-based manufacturing site. The CRF division produces bespoke profiles from S460 steel and uses Dynashape's 600 mm diameter coated TCT and SHSS TIALN-coated blades. Metsec's Profile Manipulation division uses Dynashape's 300- 315 mm diameter SHSS TIALN-coated blades.

Considerable savings for Metsec
"The improvements in sawblade life and the resultant cost savings that Dynashape has brought us are considerable," says Lee Clark, production manager at Metsec's Profile Manipulation division.

"The combined effect of longer-lasting blades and highly effective sawblade remanufacturing at lower cost equates to savings of around £2,000 per month over both divisions. Such impressive savings are extremely important to us as they play their



part in helping us to give our customers the very best possible value. The service provided by Dynashape is also exceptional. They are never more than a phone call or email away and they always collect and deliver on time."

Dynashape: the UK's complete sawblade service
Following a £1 million investment in infrastructure and the very best CNC sawblade production technologies, Dynashape is well equipped to assist manufacturers with everything involving sawing machinery and sawblades – all from under one roof.

Only this year, the business added five new CNC machines, three of which are robotic, to its already impressive capabilities. As a result, Dynashape now has the very latest 4-, 5- and 6-axis high precision CNC sawblade production technologies from leading manufacturers including Loroch, Vollmer and Walter, and is able to offer the most comprehensive one-stop solution for manufacturing and remanufacturing TCT, SHSS and solid carbide sawblades, as well as PCD tooling.

Remanufacturing, never just sharpening
Instead of sharpening blunt sawblades, Dynashape's approach is to remanufacture them using its advanced CNC machinery. For the majority of Dynashape customers, this means that for around three-quarters of its useable life, a remanufactured blade will perform like new, before there's any issue of degradation due to reduced base material and tooth facet. "The real point," stresses Chris Parkes, "is that our remanufactured blades perform just as precisely as they did when new, all for substantially less than the cost of purchasing new blades."

Dynashape is part of the Addison Group, a UK-based organisation that has been at the forefront of metal sawing technology since 1956.

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Fast, versatile, efficient

In January 1976, the Amodil Group was established as a privately-owned UK trading office for Olarra S.A., selling stainless steel bar on a manufacture to order basis. As the orders began to grow so did the stock, and in 1984 it purchased the current 81,000 square metre site at Forest Park, Cleobury Mortimer. For the next 32 years, the Group would slowly grow to become the largest stockholder of stainless steel long products in the UK with over 5,000 tonnes held of round bar, billet, wire and tubular products.

With an increasing demand for material to be supplied in cut pieces, the Group has recently invested over £250,000 to expand its already modern cutting shop to enable cuts up to 520 mm diameter with tolerances as tight as 0.5 mm. Such close tolerances demand exceptionally accurate sawing systems, which is why, when the need arose for Amodil to increase production, it chose Danobat bandsaws from Prosaw.

The machines, a Danobat IDS5, capable of sawing stainless steel solid bars of up to 520 mm diameter and a Danobat DS3, with a capacity of up to 300 mm diameter were supplied by Prosaw complete with supporting integrated extra heavy duty material handling systems.

Each machine is capable of sawing many different grades of solid stainless bars including unusual speciality stock such as Duplex, Super Duplex and 17/4 PH grades as well as the more standard 316L, 304L and 303 grades. Both machines are fitted with "M42" blades to cut faster, more efficiently and with considerably longer blade life than had previously been possible with existing equipment.

Amodil Supplies Ltd's operations manager, Alan Woodhouse says: "We have been delighted with the quality and performance of the Danobat saw systems. We feel that Prosaw have performed extremely well, which is most pleasing as they are indeed very competitive in every respect, even in relation to our previous supplier. We have also been most impressed by Prosaw's excellent response times when it has been necessary, whilst still giving us a first class service."

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Powerful cutting on the move

Starrett adds lightweight, portable bench top band saw to product range

Band saw blade and machine specialist Starrett has added a new bench top band saw machine to its extensive range. The S1105 saw has been designed to be lighter and more portable than others in the company's collection, without compromising on performance. With a powerful, two-speed 850 W motor and an adjustable cutting angle from zero to 45 degrees, contractors and hobbyists alike will benefit from the new machine.

Being considerably smaller than many bench top band saw machines and weighing only 17 kg, the S1105 saw is ideal for use on the move. The saw delivers a clean cut without the need for lubrication and, as it is so compact, there is no need to bolt the machine down before using it. Contractors of all trades, workshop managers, maintenance departments and even hobbyists will benefit from this powerful saw.

John Cove, marketing manager at Starrett says: "We've had the larger S1101 saw in our product portfolio for a long time now. However, we recognised the industry demand for a more portable alternative that can realistically be easily used onsite. This is why we developed the latest addition to our range. The saw is so lightweight and compact that it can be stored in small workshops or vehicles and transported from site to site easily.

"There are many applications where the S1105 will come in handy. For example, both providers and installers of thick or armoured cables, conduit, and trunking will find this tool particularly useful. Most sales are by length and in the case of cabling, many users rely on clamps to cut through it. However, this process squashes the wire at the point of the cut into an elliptical shape, making it difficult to install. Using our band saw would not do this as there is no pressure on the outer edge of the cable, and its portability will support contractors installing the cabling onsite."

The S1105 bench top band saw is compatible with both 110V and 220V formats, has a blade speed of 60 or 80 m/min, comes with a blade cleaning kit and is available for less than £300.

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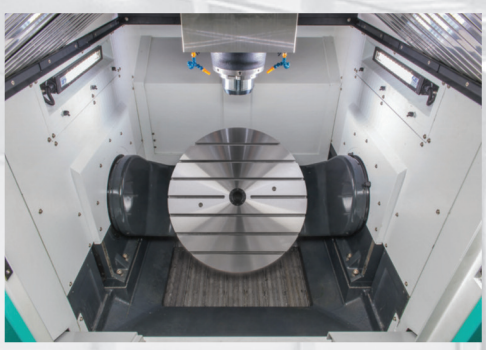

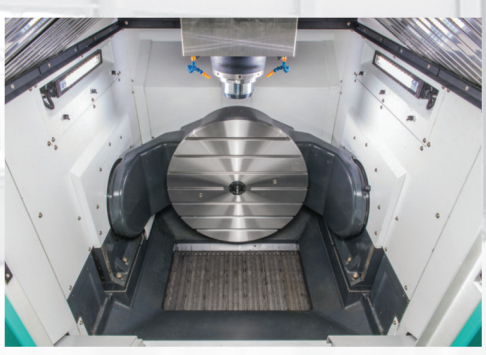

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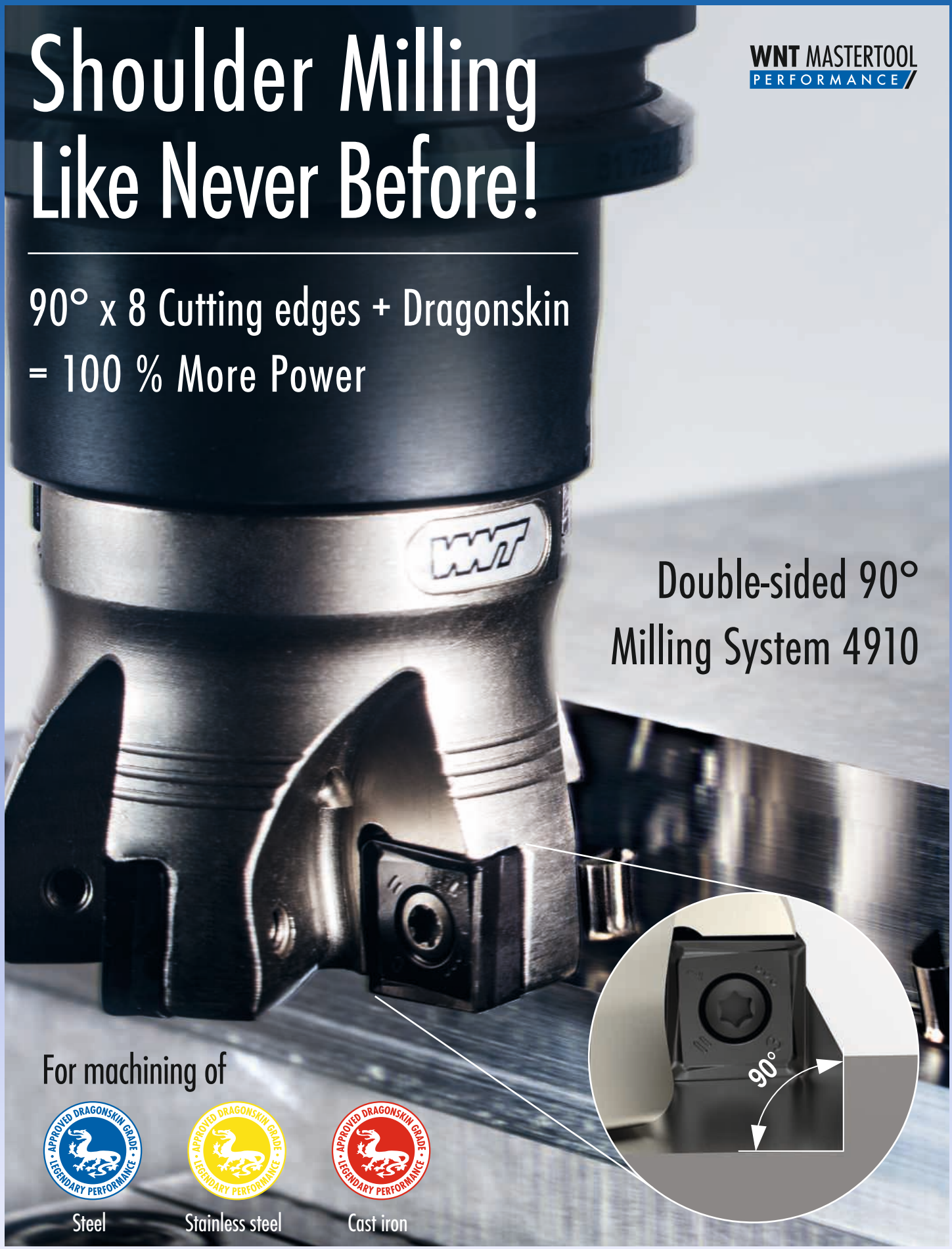

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