ENGINEERING subcontractor APRIL 2017

Join us for the official UK launch

XYZ UMC-5X THE CHALLENGER

In its price bracket, this is at the forefront of five-axis machining.

XYZ LR RANGE

Three models available

FROM ONLY £29,450 +VAT

For many this will be an ideal opportunity to upgrade and modernise their workshops.

on Wednesday 26th April at XYZ Devon and Thursday 27th April at XYZ Nuneaton

plus

April Showroom Clearance Sale

Devon and Nuneaton

All demo machine tools at both showrooms, on each day, will be heavily discounted to clear.

Over 25 machine tools must go. Call for more detail.

Join us on either launch day and see how the new 5 axis **XYZ *UMC-5X*** *will reduce all your machining time, on all your components, even on those simple jobs. 'Attend one of the one hour seminars on either day and see how 5 axis can benefit you on both complex and simple work.*

The Challenger' has arrived.

Also, on the same day, see the launch of the new **XYZ *500 LR*** *the* **XYZ *750 LR*** *and the* **XYZ *1000 LR***. *See how these VMCs offer great cutting performance at affordable prices.*

To reserve your places at either launch day, morning or afternoon, please register at www.xyzmachinetools.com. ***Please note that places are limited.***

XYZ Machine Tools

To book your demo please call us on 01823 674200

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XYZ marks the arrival of the UMC-5X with Open House events

The launch of the first gantry-type fully-simultaneous 5-axis machining centre by XYZ Machine Tools is generating lots of interest among customers. With the first machines arriving in the UK, the Burlescombe, Devon-based company is opening its doors to highlight the performance and commercial advantages of the XYZ UMC-5X in a series of Open House events.

These events will provide an ideal opportunity to see the XYZ UMC-5X demonstrated, as well as the opportunity to sit in on a brief presentation of the benefits of 5-axis machining and what it can deliver in terms of productivity gains across a wide range of industries. The first of these events, taking place at XYZ's Devon headquarters and Nuneaton showroom on the 19th and 20th April respectively, have been designated VIP days and are invitation only.

Invitations will be extended to those businesses that have indicated a serious interest in taking delivery of one of the first XYZ UMC-5X machines to arrive in the UK. Contact your XYZ area sales manager if you feel that you should be added to this exclusive guest list. Visitors can attend either the morning or afternoon presentations starting at 10:30 and 13:30 respectively on each day.

Two additional Open Houses will be held the following week on the 26th and 27th April, again at XYZ's Devon headquarters and Nuneaton showroom respectively. These days are open to all, but to assist with planning visitors are asked to register their preference of location and time by contacting XYZ at **sales@xyzmachinetools.com** or by calling **01823 674200**.

"We are very excited about the addition of gantry-type, simultaneous 5-axis machining to our portfolio of machines. These Open House events will allow us to highlight the design benefits of the XYZ UMC-5X that in its price bracket put it at the forefront of 5-axis machining," says Nigel Atherton, managing director, XYZ Machine Tools.

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McLaren-Honda extends exclusive machine tool partnership with Mazak

McLaren-Honda has further extended its contract with Yamazaki Mazak, ensuring the manufacturer continues in its role as the sole Official Supplier of CNC machine tools to the McLaren-Honda Formula One team. Mazak has supplied the team for 18 years and currently has a total of 33 machines installed at the McLaren Technology Centre in Surrey, including multi-tasking and multi-axis machines from the INTEGREX and VARIAXIS series.

This latest contract extension will see eight additional new machines installed, including three VERTICAL CENTER PRIMOS machines, four UK-manufactured VERTICAL CENTER NEXUS 530C machines and a single QUICK TURN COMPACT 300 ML turning centre.

Since starting the partnership with Mazak in 1999, the team has won two world championships and 62 Grand Prix, with the Mazak machines providing a vital in-house engineering support infrastructure, ensuring the cars are as competitive as possible.

McLaren Group COO Jonathan Neale comments: "Given the volume of precision metal cutting for materials such as titanium, aluminium and stainless steel required to deliver an F1 car to the starting grid, our machine shop sits at the heart of the McLaren-Honda engineering programme.

McLaren Honda has further extended its contract with Yamazaki Mazak, ensuring it continues as the team's Official Supplier of CNC machine tools

Our partnership with Mazak is founded upon the outstanding production capabilities of Mazak machines and the close relationship that comes from working with a trusted supplier over many years.

"For the 2017 season, we have changed every single Mazak-made component to accommodate the changes to F1 rules. Having a 33-machine strong line-up of highly precise, robust and reliable machine tools in-house gives us the confidence to make such changes between seasons."

"To put the issue into context, in the first week of February alone we undertook 560 machining jobs, each compromising of an order of up to six parts. This totalled nearly 3,000 parts in one week. Subcontracting that out would just not be feasible given the tight timescales we are working to between seasons, so we place a great deal of trust in our Mazak machine tools as we know they get the job done. 2017 is already shaping up to be an exciting season and we are delighted to have Mazak on board once again."

Marcus Burton, European group managing director for Yamazaki Mazak, comments: "F1 is one of the most challenging sporting environments in the world, and the demands placed on both the driver and car in a race requires a sizeable engineering network to enable them to turn up on the starting grid week in, week out.

"McLaren-Honda is one of the stand-out names in racing and to be able to continue our exclusive supply of machine tools to the machine shop at the McLaren Technology Centre is a huge honour. Both McLaren Honda and Yamazaki Mazak place an enormous emphasis on quality and precision in the manufacture of their respective technologies, and I feel these shared values are integral to the longevity of our successful working relationship. All of us at Yamazaki Mazak are very much looking forward to watching McLaren Honda in the 2017 F1 season and we will be following their progress closely."

(l-r) Stoffel Vandoorne, McLaren Honda 2017 driver; Maja Foster, European marketing manager for Yamazaki Mazak; Fernando Alonso, McLaren Honda 2017 driver; Marcus Burton, European group managing director for Yamazaki Mazak

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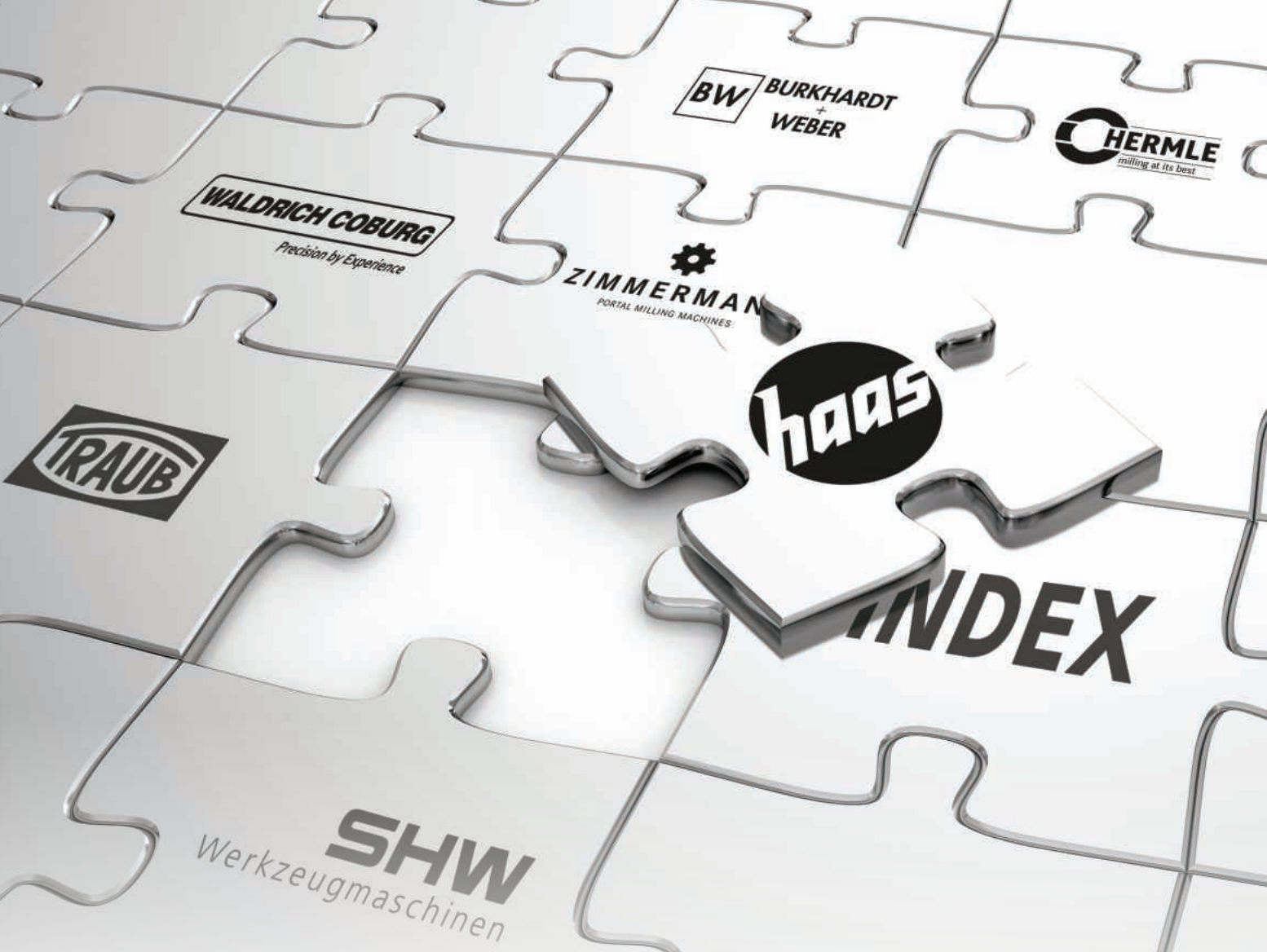

The next piece in the puzzle Haas arrived

We are proud to announce the arrival of Haas Schleifmaschinen to our family of machine tool solutions.

80 years of grinding tool expertise, now paired with **Geo Kingsbury's** unrivalled knowledge and comprehensive support.

Our newly formed Grinding Technology (GT) Division, run by staff with decades of high precision grinding experience including the development of technical solutions based on Haas Schleifmaschinen grinding machines, welcomes all existing Haas owners in the UK and Ireland to **Geo Kingsbury's** front-line service.

When it comes to precision, surface quality and efficiency, Haas' Multigrind machines are relied upon in almost every industry that processes metal; including medical engineering, precision tool manufacturing, gear manufacturing, aerospace and the energy industry.

Want to know more about Haas Schleifmaschinen?
Just ask Geo Kingsbury.

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Geo Kingsbury awarded Haas grinding machine agency

Grinding machines manufactured in Germany by Haas Schleifmaschinen are now being sold and serviced in the UK and Ireland by Gosport-based Geo Kingsbury under a sole agency agreement signed at the beginning of 2017.

The company has set up a new Grinding Technology (GT) division in Birmingham to work alongside the established Large Prismatic Machines (LPM) division in recently expanded offices on Blythe Valley Business Park.

Dean Kiefer, who has been recruited to head the GT division, has 25 years' production engineering experience in the aerospace manufacturing sector. Specifically, he has been involved in developing technical solutions based on Haas Schleifmaschinen grinders, so brings with him directly relevant knowledge of the machines and technology. He will be assisted by another new appointee, senior applications engineer Ryan Lakin, who joined on 27th February.

Richard Kingsbury, managing director of Geo Kingsbury comments: "This is an exciting development that takes us into a new area of manufacturing, as our other agency lines comprise milling and turning machines.

"Haas Schleifmaschinen is a provider of very high quality grinding solutions, including simulation software and automation options, located in Baden-Württemberg close to the headquarters of our other seven principals, whose products are similarly top-end.

"We are greatly looking forward to collaborating with Haas Schleifmaschinen's senior management to develop the market over here and provide front-line service for the 62 machines that have already been installed in the UK and Ireland over the last decade."

Use of the grinders is strong in the medical sector in Ireland, while in the UK, sales of the machines have seen rapid growth in the aerospace industry, particularly in the competitive field of turbine blade tip and root grinding.

(Right to left): Dirk Wember, member of the board, Haas Schleifmaschinen; Richard Kingsbury, managing director, Geo Kingsbury; Dean Kiefer, business development manager - Grinding Technology, Geo Kingsbury; Thomas Bader, member of the board, Haas Schleifmaschinen

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Guhring getting ready to move home

After residing in Castle Bromwich Business Park since its UK inception back in 1990, Guhring has long outgrown its existing facility. Now, the company is set to realise its ambitions by moving to a purpose built 55,000 sq ft facility on the new Birmingham Advanced Manufacturing Hub. Located near the M6 and the main A38 arterial road, the purpose built facility will enable Guhring to move and vastly expand its HSS, carbide and PCD cutting tool production operations all under one roof.

Construction of the new factory commenced in February 2016 and the movement of machine tools and inventory will take place until April with no disruption to service. Guhring is aiming to have all its staff and equipment in the new factory and operational for 18th April. The official opening ceremony is planned to take place in early summer 2017 with VIPs, the dedicated Guhring team and entertainment to welcome guests and customers to the celebratory event.

Currently employing over 80 people, the new £11 m investment will allow Guhring to organically grow and rapidly realise its ambition of employing 125 staff whilst creating greater market penetration in its core markets.

Guhring's national sales manager, Dave Hudson says: "We are excited by the prospect of moving to a new home for Guhring to support the UK manufacturing industry. The new site will make Guhring one of the UK's largest cutting tool manufacturers and it will give us considerable space to install new plant and equipment in order further grow our production and coating of specialised carbide, HSS and PCD tooling products. In addition, we will have the capacity to stock a complete range of standard and special products for immediate delivery to customers.

"As well as growing our production and service capacity and capability, we will also be able to demonstrate to customers live cutting trials on the latest machine tools that we will be installing in a new demonstration area. The investment is significant and our aim will be to manufacture and deliver a complete solution of bespoke cutting tools and applications from under one roof."

Further details of the location and on the official opening will be announced when information is available.

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Building on success

Building on the success of our seven existing machine tool agencies, Geo Kingsbury welcomes grinding machine manufacturer Haas Schleifmaschinen to its family of machine tool solutions.

Pairing the highest quality German machine tool manufacturers with **Geo Kingsbury's** unrivalled technical knowledge and comprehensive support brings you innovative production solutions, tailored to your individual business needs.

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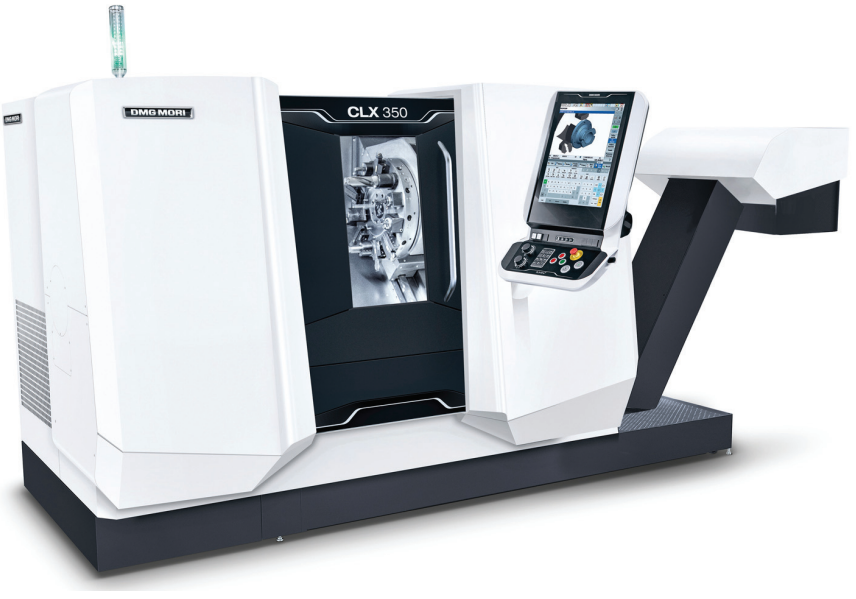
A showcase of state-of-the-art technology

by Roger Barber

At its annual Open House in Pfronten, Germany, world-leading machine tool manufacturer DMG MORI certainly lived up to its reputation of being a pioneer in developing the latest innovative technology to meet the needs of a fast changing digital manufacturing world. Understandably, there were fewer world premieres, with EMO 2017 on the horizon. However, the buzz around the event was tangible and a number of new developments certainly kept the vast number of attendees on their toes. Here are just three of them:



With the CLX 350 DMG MORI is now opening up the entire range of technological performance for its customers

Precision and performance with a minimum space requirement of < 5 m²

With the CLX 350, DMG MORI opens up the entire range of technological performance for its customers.

The portfolio encompassing the entry-level series CLX, CMX V and CMX U positions DMG MORI as the customer-orientated bedrock for integral machining solutions. Numerous modular equipment options and technologies as well as attractive prices are the hallmark of these machines. DMG MORI presented the new CLX 350 universal lathe at the recent Open House in Pfronten as the latest model in this segment. Whereas the fundamental performance features of a machine used to be the key issues for an investment decision, the overall performance of a machining solution is the yardstick for users of today. This is why DMG MORI is now also opening up the entire range of technological performance for its customers in the case of the CLX 350.

In its standard version, this compact model, with a footprint of less than 5 m², machines bar material of Ø 51 mm, with Ø 65 mm also available as an option. The maximum turning diameter of the CLX 350 is 320 mm. It has travel paths of 242.5 mm in the X-axis and 530 mm in the Z-axis. The VDI 30 turret has space for twelve tools, powered as an option. This all adds up to make the CLX 350 an efficient and highly-productive universal lathe for a multitude of different applications.

With a speed of 5,000 rpm, the highly-dynamic spindle can machine complex, high-quality components and guarantees precision and accuracy of the workpiece. The labyrinth structure and air cooling prevent the penetration of coolant thus promising a high level of productivity and a long life cycle. The replacement cartridge means the spindle can be changed quickly and simply, even during servicing. The ball screw, with a tolerance class of IT 1, also plays a key role where precision and outstanding surface quality is required.

The compact and stable design of the machine ensures maximum rigidity, even in the boundary areas of machining, as well as optimum chip removal. Optimised chip flow also ensures maximum productivity for the CLX 350 in addition to the technological performance of its spindle and drive. The optional chip conveyor for the rear of the machine enables simple cleaning.

Thanks to its 19" multi-touch control from SIEMENS the CLX 350 also offers the user fast and simple operation combined with perfect ergonomics and compact dimensions.

The new 19" DMG MORI SLIMline® multi-touch control plus software solutions, such as ShopTurn for fast, simple and error-free programming on the machine and advanced simulation possibilities, round off the offer. What is more, DMG MORI technology cycles, including Easy Tool Monitoring, make working with the CLX 350 even easier.

In line with the strategic orientation in the basic machine segment, modularity and additional production solutions are also the characteristic features of the CLX 350. These include control options as well as diverse automation possibilities.

The 19" DMG MORI SLIMline® Multi-Touch Control is one of many highlights of the new CLX 350

Milling, turning and grinding in a single setup

DMG MORI is enabling best surface qualities thanks to the integration of grinding technology in the duoBLOCK® models.

After setting standards in technology integration with mill-turn technology for almost two decades, the machine tool manufacturer has now expanded its portfolio in this field to include a new variant with milling, turning and grinding (F-mill D-turn S-grind) capabilities. As of now, integration of the grinding technology is available for the size 80, 125 and 160 machines in the DMU / DMC FD duoBLOCK series, thereby guaranteeing best surface qualities of up to 0.4 µm. Milling, turning and grinding are carried out in a single setup, so deviations resulting from retooling are also eliminated. This complete machining capability including grinding is further supported by exclusive DMG MORI technology cycles.

The new F-mill D-turn S-grind variant

DMG MORI supports the grinding process of the FDS models in the duoBLOCK series with DMG MORI technology cycles for internal, external and face grinding. Truing cycles expand the range of functions. Also new is an AE sensor (Acoustic, Emission) that guarantees maximum reliability and accuracy by detecting the first contact between the grinding wheel and the truing unit. The first contact between the grinding wheel and the component is also determined via the spindle load factor. DMG MORI has equipped the 1,300-litre coolant unit of the FDS machines with a centrifugal filter that catches even the finest particles (> 10 µm) from the grinding process.

DMG MORI supports efficient and productive complete machining, comprising milling, turning and grinding with the aid of exclusive DMG MORI technology cycles, especially where grinding is concerned. The calibration cycle, for example, enables calibration of the truing station. Cycles for internal, external and face grinding, plus truing cycles for truing the grinding wheel, round off the offer. In addition new grinding wheel diameters can be defined automatically.

Automation can really be so simple

DMG MORI presented the Robo2Go as a mobile automation system for lathes with intuitive programming via CELOS® Powertool.

The core of the integrated turning cell is the new loading and unloading system Robo2Go. Designed for mobile use with up to four lathes, Robo2Go is controlled via CELOS with just a few entries and without any special knowledge of robots.

The Robo2Go system excels through its flexibility. It can be positioned at different lathes as required with a lifting device in the shortest possible time, which of course maximizes investment security. Free access to the work area of the machine tool remains guaranteed at all times. What makes it so special is that the robot is programmed directly in the machine control with the aid of a special CELOS powertool. In other words: all the operator has to do is enter the dimensions of the workpiece, the chuck and the gripper, then select one of the pre-defined arrangements of the workpiece tray and finally start the automatic process.

"This intuitive way of programming a robot enables especially small and medium-sized enterprises entry into flexible automation without the need of any expert knowledge", explains Silvio Krüger, CEO of DMG MORI Systems.

This all adds up to make Robo2Go an affordable entry into automated processes with barrier-free safety technology. The use of an area scanner means that Robo2Go does not need protective fences, because the system shuts down as soon as a worker enters the defined safety area. A faster working speed is possible for the robot because this is not a collaborative solution in which the human operator works in the action area at the same time as the robot.

The Robo2Go is programmed via a special Robo2Go App

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Robo2Go is designed for mobile use with up to four lathes

Eliminate pitch and positioning errors with new advanced wire EDM

GF Machining Solutions presented its new high-precision AgieCharmilles CUT 2000 X advanced wire EDM at IMTS 2016. Live in-booth machining demonstrations of a light emitting diode (LED) stamping die plate showcased several of the CUT 200 X's advanced features and micro machining capabilities.

The extremely accurate machine eliminates pitch and positioning errors that would otherwise result in scrapped parts and increased production costs. The machine's precise positioning capabilities allow it to hold very tight part tolerances for the utmost in quality and surface finish.

With the CUT 2000 X, machine shops can easily achieve ±0.00006" pitch accuracy over 13.385" x 9.050" and the same for M-shape form accuracy at a maximum metal removal rate of 16.535" square/min. Stringent factory assembly standards and specific calibration tests ensure the machine's performance for today's complex, high-precision workpieces.

For the live IMTS machining demonstration, the CUT 2000 X used its automatic wire-changing capability to both rough and finish cut the die plate's no-core cavities in a single setup. The machine's Advanced 3D Setup precisely located the part for fast, efficient set up, while an Integrated Vision Unit (IVU) measured each cavity and transmitted the accuracy results in real time.

To further enhance setups, the accurate, efficient Advanced 3D Setup completes a variety of measurement cycles, including stepped parts and measurements outside the wire path.

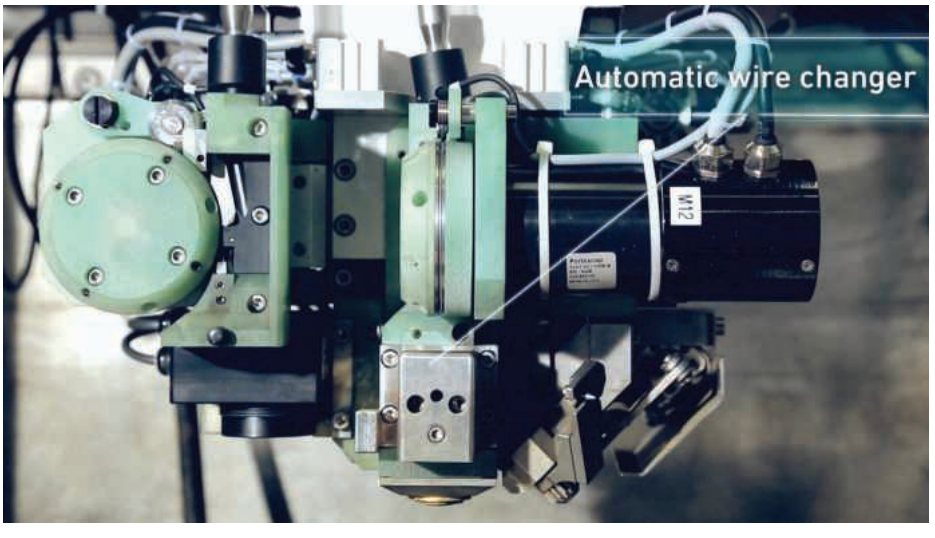
The CUT 2000 X's third-generation automatic wire changer automatically transitions between two different wires to both rough and finish parts. This technology eliminates the need to set up and align the machine between roughing and finishing operations, which dramatically improves cycle times and accuracy.

The machine's patented universal 3-point wire guide system handles up to 30 degree tapers. Plus, the guides' rotatable v-prisms can extend their working lives for thousands of hours, while the same wire guide is used for wire diameters that range from 0.004" to 0.013".

GF Machining Solutions developed the CUT X Series of machines in response to the growing demand for reliable high precision in large production runs of complex components. The machines' precision is supported by adapted mechanical structures that ensure high accuracy and high thermal stability, as well as dedicated machine calibration and testing.

Machines in the CUT X Series are especially well suited to the production of stamping tools and multi-cavity moulds for electronics, information and communications applications. They also excel in micro components for medical applications and watchmaking.

GF Machining Solutions is a world leading provider of machines, automation solutions and services to the tool and mould making industry and to manufacturers of precision components. The products range from electric discharge machines, high-speed and high-performance milling machines, including clamping and palletisation systems, 3D laser surface texturing machines, as well as service, spare parts and expendable parts, consumables and automation solutions. GF Machining Solutions is a globally acting division of the Georg Fischer Group (Switzerland) and maintains a presence on 50 sites worldwide within its own organisation.



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Wire-cut and die-sinking EDM machines from Makino

Makino is best known in the UK for its medium to large machining centres and its VIPER grinding platforms for high-efficiency production of nickel alloy parts. Sole UK and Ireland agent NCMT points out, however, that the Japanese company also manufactures electric discharge machining (EDM) machines, of which it produces over 1,000 units per year.

Two competitively priced machines have been launched recently in the UK, a die-sinker and a wire-cut model featuring new Hyper i control technology. A smartphone-type user interface with touchscreen navigation helps a novice user to match the capability and productivity of an experienced operator.

EDAF die-sinking EDM machines

The EDAF3 ram-type EDM machine and its smaller counterpart, EDAF2, have a rigid and precise structure and integral thermal cooling of the Y- and Z-axis castings to ensure long-term accuracy. Table size is 700 mm by 500 mm and the dielectric reservoir is built in to the base casting to improve thermal stability further and to minimise the machine's footprint.

Access to the working area is unrestricted due to a programmable, three-sided drop-tank system. Unattended machining is extended by automatic electrode change and automated workpiece delivery and removal options. A fluid cooling unit maintains the dielectric at a constant temperature for stable burning conditions, while ram temperature control and a high precision, C-axis head are additional features. Electrodes weighing up to 75 kg may be used.

The machines include the latest Hyper-i control system with an interface similar to that found on tablets and smartphones. It delivers efficient and productive results while bringing new levels of user-friendly operation to the shop floor. The control contains intelligent, intuitive and interactive functions streamlined to assist the operator at every step of the machining process. It also enables easy access and selection of power settings to produce accurate results in rapid cycle times.

The new, on-board programming system, Makino Program Generator, has been designed to simplify use of the control, while generating aggressive machining programs to meet the demand for shortened lead-times on today's shop floor. By providing answers to prompts and inputting basic data, even novice operators are able to generate efficient and safe burn routines. The new program generator also allows for programming of multiple electrodes and multiple burn locations.

ArcFree technology is standard on EDAF-series machines. In the past, if a CNC sinker developed a destructive DC arc during machining, the job would have to be stopped and both the workpiece and the electrode cleaned. Sometimes they would have to be scrapped. Makino machines have sophisticated spark gap monitoring and arc prevention circuits, so there is virtually no possibility of a destructive arc developing. Even jobs that offer less than optimal surface areas of burn due to electrode / workpiece geometry can be started with unusually high current density and relied upon to continue flawlessly, promoting operator confidence during unattended running.

Makino's High Quality Surface Finish technology provides the EDAF with improved electrical conductivity for more consistent discharging and spark diffusion. It eliminates secondary discharges that waste energy while permitting increased efficiency of the sparks for a superior finish without lowering metal removal rates. A new power-saving mode automatically activates at the end of machining, reducing the machine's power consumption while idle by 70 percent.

Optional performance enhancing features include Makino's Z-axis stabiliser technology involving liquid cooling of the Z-axis ball screw and nut, allowing cavity floor surface blending to within one micron. A further option is a fine-hole configuration for precision machining of details smaller than the eye can see.

The machine can be factory ordered with the control mounted on either the left or right, facilitating easy integration of one or more machines with a variety of commercially available electrode and work pallet handling robots.

The machine can be factory ordered with the control mounted on either the left or right, facilitating easy integration of one or more machines with a variety of commercially available electrode and work pallet handling robots.

U-Series H.E.A.T. wire-cut EDM
Makino's most technologically advanced wire-cut EDM machines are the U3 and U6. Designed for ease of operation, versatility and low operating cost, the machines are the next-generation solution for improved profitability in wire EDM processes.

The new models offer enhanced performance in a design that makes competitive cycle times and high degrees of accuracy and surface finish easy to achieve. With the addition of new HyperCut technology and the Hyper-i control, even novice operators can program and produce top quality components with the most complex geometrical features. It is a significant competitive advantage for shops experiencing difficulty replacing skilled EDM operators.

The U6 offers X-, Y- and Z-axis travels of 650 mm, 450 mm and 420 mm respectively. Workpieces up to 1,000 mm by 800 mm by 400 mm with a maximum weight of 1,500 kg can be accommodated. Other features are reduced wire consumption rates and a choice of two guide configurations for the 0.1 to 0.3 mm diameter wire - conventional round or split V - to accommodate nearly all material types and flushing conditions.

Both the U3 and U6 are available in optional H.E.A.T. configuration, featuring Makino's High Energy Applied Technology. It incorporates high pressure, dual digitally controlled flush pumps and a large capacity, four-step filtration system that together provide even faster machining speeds. H.E.A.T. technology is designed to provide unparalleled wire EDM speed and accuracy in parts with geometries that make flushing difficult.

An extensive library optimises cutting using standard hard brass wires, high-speed coated wires and high-taper soft wires. The extent and versatility of the entire cutting condition library ensure that all workpieces can be machined at optimum productive levels. Makino is a long-standing industry leader in reducing wire consumption. No special settings are needed, as every cutting condition including sealed and poor flush applications is automatically optimised.

U-series wire EDM machines feature an innovative design in which the entire bed casting is used as the dielectric reservoir. The design reduces the footprint compared with previous models and eliminates the need for additional external fluid tanks. By merging all machine components into a single base structure, improved mechanical rigidity and thermal stability are provided and the stationary table design ensures sustainable long-term accuracy. Additionally, work zone access has been simplified for ease of access and maintenance.

Makino's HyperCut technology is a three-pass process developed to produce surface finishes as fine as 3µm Rz in standard tool steels. The performance enhancement represents a 20 percent reduction in cycle time and 14 percent reduction in wire consumption compared to the previous technology. Makino has also developed a proprietary Pro-Tech circuit that provides electronic galvanic protection to the workpiece to prevent or at least minimise rusting and oxidation, preserving the integrity of the part without the need for chemicals.

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From one generation to the next

When it comes to perfection and precision, Hornung in Swabia is second to none and has been aided by Mitsubishi Electric machines for generations.

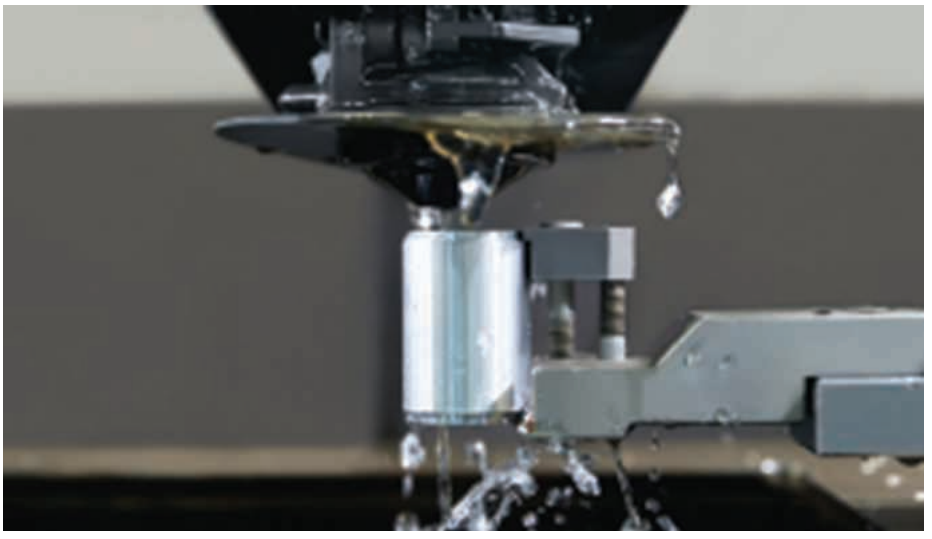
Ten years ago, Andreas Hornung joined his father in putting the company in Urbach on a new footing. While the firm had previously concentrated solely on mouldmaking, Andreas Hornung coupled his arrival with a shift in emphasis to the production of steel and cemented carbide tools and complete subassemblies.

The company's slogan of "Precision meets Perfection" suggests the importance attached to EDM technology. Although it provides all machining methods, wire EDM takes pride of place. It is here that the family-run company has acquired so much skill that it enjoys a reputation as a problem-solver well beyond the immediate region.

"We've achieved a very high degree of vertical integration, so a batch size of one is pretty well standard," explains Andreas Hornung. "We're appreciated by our customers because we handle tricky components with very complex shapes and because we deliver the finished parts quickly and often overnight."

This means that the increasing expectations of flexibility and rapid delivery have become part of day-to-day business. Time is wasted in a big way, he says, due to inaccurate drawings or the fact that design offices often lack the experience of what is technically feasible. In some cases, on the other hand, much greater accuracy is demanded than is actually needed.

"This of course takes extra time for machining," says Andreas Hornung, who is often on hand for advice in such cases. So that time is available for difficult projects, Hornung is dependent upon machines that run smoothly and for which a rapid trouble-shooting service is available in the event of a problem. "The Mitsubishi Electric service is brilliant," says Andreas Hornung, summing up his decade of experience.



Rapid re-tooling

Several wire-cutting machines from Mitsubishi Electric stand harmoniously in a row and are in constant operation. While the two FA 20s are already ten years old, they were joined in the machine park by the MV Series in only August 2015. Since very few jobs involve production series, this means that each of the three wire-cutting machines is re-tooled three to four times each day.

"This is a trouble-free process," says Andreas Hornung, who didn't take long to choose the new MV Series. "Our experience, particularly of the after-sales service, has been so positive that we didn't want to change supplier."

For the clocked machining of circular parts overnight, the company purchased an additional powered axis.

"The practical thing about this is that it has the same interfaces with the two older machines, so it can be used on all three machines," adds Andreas Hornung.

The servo-controlled B axis integrated in the machine CNC control permits wire-cutting of the rotating workpiece. Consequently, cutting a block into several parts and multi-sided machining can be carried out in a single clamping.

Dimensional accuracy

Hornung's customers mainly come from Stuttgart and its environs and include such big-name manufacturers as Daimler, Bosch and ZF, but its contacts also extend as far as France and Spain. For these customers, it mainly machines parts for the automotive sector, such as calibration measuring heads for diesel injectors. But it also regularly serves the electronics industry and medical technology, producing aids for spinal surgery, among other things. The most complicated components are now sent to Spain. The accuracy of the finished items is in the 2 µm range, despite the difficulties imposed by the often hot Swabian summers.

The new MV Series machine is quite a bit faster, which is due among other things to the automatic wire threader. Such integrated functions as the Corner Master also contribute to this. But what ultimately counts for Hornung is the machine's precision. The surface quality of the workpieces, which can be of any commonly used material, is as fine as Ra 0.13 µm.

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Sodick EDM improves cycle times and precision for die-casting specialist

A market-leading die casting shop has acquired a new Sodick AG40L die sinking machine from Sodi-Tech EDM. Installed in the company's expanded toolroom facility, the machine is not only 10 times faster than the outdated EDM machine it replaced, but also offers far better surface finish and accuracy.

Established in 1961, Daften Die-Casting Ltd is a family-run business situated beside the river Camel in Wadebridge, Cornwall. The company offers aluminium pressure die-casting, from the design and manufacture of tooling through to the die-casting of components and machine finishing, as well as powder coating in a wide variety of colours and finishes.

In short, Daften is a one-stop-shop for aluminium pressure die-castings. The ISO9001 accredited business has expanded rapidly, now employing 43 staff and achieving a turnover of circa £3 million. Exports are also growing and currently represent 26 percent of revenue. Part of the company's success can be attributed to its planned programme of ongoing investment in state-of-the-art equipment and technology at its 1500 m² facility.

In July 2016, Daften also opened an additional unit for CNC machining, toolmaking and R&D activities. This purpose-built facility extends Daften's technological capabilities to meet the demands of the 21st century. It is here that the new Sodick AG40L die sink EDM is situated.

"Our previous die sink EDM had become slow and unreliable," states toolroom director Grant Weedon. "We considered a variety of potential replacements, but the Sodick AG40L was affordable and came equipped with a tool changer and fire extinguishers as standard. Furthermore the extensive support provided by Sodi-Tech came highly recommended."

The AG40L, which was installed in September 2016, features Sodick's linear motors, the latest in no-flush EDM technology, a user-friendly control and zero electrode wear. It offers travels of 400 by 300 by 270 mm in the X, Y and Z axes respectively, along with a 600 by 400 mm work table. The machine has been set to work producing cores and cavities for die-casting tools, as well as some prototyping projects. The tools are destined for industries that include the pump, telecommunications, lighting and audio sectors.

"In essence, we are using the AG40L to eliminate the need for milling complex tooling parts to extremely tight tolerances," explains Grant Weedon. "The finish we are achieving is amazing, as is the accuracy. We've never held 0.01 mm on a die sink EDM before. In addition, I would estimate that Sodick machine is 10 times faster than our previous model, which means we have gained extra capacity. It highlights the importance of investing in the latest manufacturing technologies."

Although the AG40L is Daften's first experience of Sodick EDM machinery, the company only required two days of training to become familiar with its operation.

"Each tool we produce is a one-off, so ease and speed of programming is vital if we are to be competitive, particularly as most of the tools are complex and can be sparking for a few hours each," adds Grant Weedon. "However, our operators find the machine extremely easy to use and we have already achieved good utilisation since it was installed.

"Ultimately we have bought this machine to make our tools in-house, instead of buying them from China," he concludes. "It gives us much greater control over the whole process, which is definitely in the best interests of our customers."

Sodi-Tech EDM Ltd is the exclusive distributor of Sodick EDM products in the UK, with a wide range of Sodick wire-cut and sink EDM machines on display at the company's large showroom in Coventry, West Midlands. An experienced team of regional sales engineers who can help you decide on the right value-for-money product available, backed up by a specialist team of application engineers, are on hand to demonstrate each machine's capabilities, ensuring that your final choice will suit the type and quality of components that you wish to manufacture.

Grant Weedon with Sodick Technology installed at Daften

Sodi-Tech also boasts a high level of After Sales Service and Support, offering a comprehensive range of genuine consumable items that ensure your purchase maintains its accuracy, speed and quality of finish for the duration of its working life.

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Excetek supports the top tier at Electro-Discharge

From its impressive facilities in Dudley, Electro-Discharge Ltd provides a specialist subcontract CNC wire and spark erosion service to a diverse engineering customer base. With industry leading quality accreditations and a plant capacity list that features over 30 wire and spark erosion machines. These include the latest generation Excetek CNC wire cut machines supplied by exclusive UK agent, Warwick Machine Tools, installed to operate automatically at speed, to close tolerances in a 'lights out' environment.

Originally established in 1980, Electro-Discharge initially targeted engineering businesses in the West Midlands. However, continued growth means today its customer base is spread across the UK, and its knowledge and services are also prized by international manufacturing companies.

Since coming under new ownership, as part of the successful MJ Sections group, at the end of November 1999, many changes have taken place within the company.

"We have a management team with many years' experience in the wire and spark industry," explains general manager, Rupin Vadera. "We moved to our current purpose-built 7,000 ft^2 facility, invested in updated machines to allow for increased capacity and introduced a shift pattern to meet customer turnaround requirements.

"When I started back in 2000," he recalls, "we had a CAD system and four conventional EDM machines. Today, we use the latest Solid Works, Catia 5, and PEPS CAD/CAM programming software, so customer programs or drawings can be emailed in IGES or DXF formats and the exact sizes can be obtained. We now have over 30 wire and spark erosion machine tools installed in our facilities and, where possible, the machines are run around-the-clock, 24/7."

Around 90 percent of the company's business is aerospace related, so it is no surprise that its quality system is NADCAP accredited to AS7116, AS9100 REV:C, ISO 9001-2008 and Rolls-Royce SABRe9000. In addition, 27 highly skilled staff on the shopfloor support the high variety, tight tolerance components that Electro-Discharge's customers entrust the company to deliver to stringent deadlines. An in-house toolroom produces any electrodes required as well as bespoke fixturing where necessary, thus maintaining control over both the quality and timeframe.

Materials machined range from standard carbon steels right through to all the high end exotic alloys used for airframe and aero engine components. High performance alloy components are often 'free issue' from the customer and usually are at the end of the manufacturing process, so a high degree of value has already been added to the parts. Manufacturing procedures have therefore been developed so that mistakes that might lead to a missed delivery to the end customer are minimised.

"When we initially run into capacity issues, we had to resolve them quickly," explains Rupin Vadera. "Although we were aware of the Excetek range we didn't fully appreciate the capability and functionality offered. We arranged a demonstration at Warwick Machine Tools' showroom near Kenilworth and everyone was impressed with both the build quality and performance. The price-to-performance ratio is exceptional."

To meet the component sizes and capacity forecast, Electro-Discharge ordered two Excetek V850G CNC wire EDM machines. The large capacity 1,000 litre submerged tank of the V850G is able to take workpieces weighing up to 1,100 kg and measuring up to 1,100 x 850 x 345 mm. Standard axis travels are generous at 800 mm in X, 500 mm in Y and 350 mm in Z, although a larger vertical Z axis can be specified. Like all the machines in the popular 'V' range the V850G features a C-frame structure, designed using FEA software to provide exceptional accuracy in the linear axes movements and to minimise any thermal influence.

The AC servo motor driven C1 class ball screws are cryogenically treated to minimise the thermal effects of the machine's ambient operational environment, with high accuracy

linear scales fitted for positional feedback. A key feature for Electro-Discharge's extended operational hours is the automatic wire feed and threading (AWT) system.

Designed to provide continuous unmanned operation around-the-clock, the AWT offers the ability to thread the wire at the point of the breakage. An automated annealing system straightens the wire so that it can be threaded at the break point during machining with almost 100 percent reliability and without the need to return to the start position. Submerged wire threading is possible, which removes the need to drain and refill the tank. A waterjet assist system is available for automatic wire feeds on tall workpiece.

Other optional extras that can be specified for increased machine operating efficiency include remote monitoring via ethernet or internet and Short Message Service (SMS), which will automatically send an alarm message to a mobile phone if the machine stops cutting. For extended operation, a 50 kg jumbo wire feeder can also be fitted.

Excetek leaves nothing to chance and even the CNC system has been developed in-house, using Windows-based XP-E 64-bit architecture with a 15 inch LCD touch-screen for programming. Excetek says it is easier for operators to understand as they are already familiar with the 'look and feel' of the Windows environment. It

cuts down the training time required, so one day's training is all that is required before the operator is competent to program and run the machine. Programming can be done using standard ISO G code or Excetek's Icon Assistant conversational software, which uses the controls extensive database of cutting technologies. The control system

can also apply offsets to allow for any misalignment during workpiece loading. Before machining an edge finding operation sets the actual position of the raw material, and the control software resets its datum points accordingly.

A new design EF (AC) Electrolysis Free generator system provides improved cutting speeds that are around 10 percent faster, a maximum cutting speed of 300 mm^2/min can be achieved with 0.3 mm diameter zinc coating wire and the optional Excetek high speed cutting circuit. The generator also supports super finishing techniques using high frequency technologies on surface finish cutting, so a roughness of less than 0.2 micron Ra can be obtained with one cut and four skims.

Rupin Vadera says: "While we were waiting for delivery and installation, WMT provided us with a showroom demonstration machine on loan so that we could keep up with the initial workload that our customers had placed on us. This allowed us to maintain our on time delivery record with our customers. I know the machines are running well as they are often praised during our management meetings."

The staff at Electro-Discharge has quickly become proficient at programming the user-friendly NC system fitted to the Excetek machines.

"Like many engineering companies, we could do with more skilled people," Rupin Vadera states. "We have already inducted three apprentices and they will finish their training programme in April 2017. It is the first time we have taken apprentices on and we will look to add to this pool going forward."

As well as the aerospace sector Electro-Discharge also supports high precision general engineering companies.

"We plan as much as we can, but you never know what will come through the door," Rupin Vadera concludes. "That is why we appreciate the capacity, performance and flexibility of the Excetek EDM machines."

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Specialist EDM drilling technology

TEK4 is a world leader in the drilling technology for cooling holes as applied to jet engines and gas turbines for energy production. Established in 2002, the company doubled its premises in 2016 in Leicester to accommodate a new showroom/research centre and increased production capability to satisfy international demand.

TEK4 specialises in EDM (Electrical Discharge Machining) for fast hole drilling, combined EDM and laser machines for hole drilling and ceramic coating ablation, LASER for drilling and cutting operations and ECM for STEM drilling deep cooling holes in Gas Turbine components. All TEK4's machines are designed and manufactured in Leicester. TEK4 is able to offer customers in-house process development, turnkey solutions and process application innovation. TEK4's in-house team of design, software, mechanical, electronic and application engineers gives it the ability to offer total solutions

The recently expanded and refurbished TEK4's premises offer great facilities and location, with three international airports within one hour travel time. Machines are always available for demonstration and customer specific trials. A team of application engineers are ready to look at new applications, whileTEK4's in-house engineering team is the key to its continued growth and success, with many years of experience in special process hole drilling technology.

The 5g FHD EDM series of machines are the latest generation of fast hole EDM machines from TEK4. This 5th generation technology encompasses world-leading performance and capability. Industry leading performance and process quality have been specifically developed for aero and IGT hole drilling of blades, vanes, segments and other components.

5g FHD EDM systems are designed specifically for machining turbine components, as the machine configuration enables larger than expected components to be machined in a single setup. The option of a100 W fibre laser ablation unit can be fully integrated in the system. This allows

ceramic coatings to be removed in the drill area prior to EDM drilling combined in a single machine.

The TEK4 multi hole drilling (MHD) EDM machining centre produces multiple cooling holes in turbine blades and vanes. The system has the capability to produce straight, shaped and slotted holes. The dielectric can either be traditional oil-based fluid or de-ionised water for rapid machining rates. The Tech-Pulse EDM generator is a multi-mode output type, allowing optimised use of tungsten electrodes, graphite and brass or copper tubes. The programmable generator allows for full parameter control during the EDM cycle and the ability to change process parameters with depth, thus optimising the process in all areas of the cut.

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Lightning Machining gains from improved productivity with XYZ

Some may suggest that starting a business in the aftermath of the 2008 financial crisis may not be the best idea, but this is exactly what Pete Ivings did.

"In 2009 I was working as a contract production engineer at a leading motorsport company and they had a major project on the go that required wire erosion. As this was an area of expertise for me, I discussed it with them, put in a proposal to supply these parts and that is what led me to start Lightning Machining. It was me, with a rented wire-eroder, working early mornings and late evenings, while fitting in a day shift in between," says Pete Ivings, managing director of Lightning Machining. The success of this initial contract and the extensive contacts that he had in the motorsport field, has ensured that the company has grown consistently in the intervening years, with expansion into CNC milling and CNC turning to complement the wire eroding capability.

The business has continued to develop to service the growing demand for machined parts from not only motorsport, Formula One in particular, but also customers in the renewable energy, automotive, marine, food processing and aerospace sectors. The most recent arrival is an XYZ 2-OP portable vertical machining centre, which sits alongside an existing XYZ CT52 turning centre and an XYZ SLX 1630 ProTURN lathe.

"The XYZ 2-OP arrived in September 2016 to initially help with a new contract for a Formula One team in the build up to the 2017 season, which would be our biggest order to date. Initially I looked at buying a used vertical machining centre, but came up against two issues; one was available space on the shopfloor and the second was that the price differential between a good second hand machine wasn't big enough to overcome the reassurance of buying new, with all of the support that comes with it if required from XYZ Machine Tools."

The compact nature of the XYZ 2-OP with a footprint of just 775 mm by 1,380 mm meant that it would easily fit at the side of the existing XYZ CT52 turning centre at Lightning Machining, allowing it to be used as intended as a first or second operation machine tool to machine faces, pockets, drill holes, rigid tapping and even 3D surfacing (run from CADCAM), as you would from a stand-alone vertical machining centre. Other added advantages over the existing mill were the eight-position tool changer and 6,000 revs/min spindle on the XYZ 2-OP and the 355 mm by 305 mm by 455 mm axis travels that can accommodate around 80 percent of the work done by Lightning Machining. This work encompasses a range of materials, including titanium.

"The spindle speed of the XYZ 2-OP allows us to achieve high performance and excellent surface finishes and the toolchanger means that we can leave it running unattended for reasonable periods of time, freeing up valuable manpower to do other things," says Pete Ivings.

"By using the XYZ 2-OP as both a stand-alone VMC and also as an extra spindle for secondary operations maximises the available labour that we have. In the first six weeks since the 2-OP was installed the machine has run long days and I estimate it has machined £20,000 worth of parts. At that rate and with the added productivity gains we are getting from it the payback will be extremely short."

The XYZ 2-OP may be compact, but it is making a big impact on the bottom line at Lightning Machining

Space is at a premium at Lightning Machining, but the three XYZ machines complement each other to deliver a strong machining capability

This level of production equates to an almost doubling of the amount of milling work undertaken by Lightning Machining in the first month since the XYZ 2-OP was installed. The machine has been busy since it arrived and the added productivity will impact positively on the bottom line of the business. Enhancing the speed at which Lightning Machining started to see the benefits of the XYZ 2-OP was the simplicity of the ProtoTRAK control.

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Subcontractor chooses big capacity route to 5-axis machining

To extend its capacity in terms of both size and versatility, Sheffield-based contract manufacturer Ian Cocker Engineering has installed its first 5-axis model, a Hurco VMX84SWi. The machine is the largest in the manufacturer's VMX range and the first to be installed in the UK.

Proprietor Ian Cocker says: "The large working envelope means that we can machine parts that we previously had to turn away. We produce them cost effectively, as the machine has an integral B-axis spindle head and we have added a fifth CNC axis by purchasing a Kitagawa rotary table.

"It is a very versatile 5-axis solution, as we can use the rotary table either upright or on its back to tackle five sides of a component in one hit, or for full simultaneous 5-axis cycles. Then if we take it off the table, long components measuring over 2.1 m can undergo up to 4-axis CNC milling and drilling."

In 2014, volume production for the oil and gas industry accounted for 80 percent of the subcontractor's turnover. That figure halved due to the slowdown in the sector. Luckily, much of the shortfall was replaced by development contracts in the same field, while additional work was won from the AMRC (advanced manufacturing and research centre) at Sheffield University and also from Sheffield Forgemasters.

A batch of components for the latter customer was one of the first jobs to be put onto the VMX84SWi, which was installed in September 2015. The project involved re-engineering seven rack segments, one-meter long, for the axis drives on a Chinese-built floor-type milling machine in use at Sheffield Forgemasters. Each segment required 40 teeth to be machined at an 11 degree angle to an accuracy of ±15 µm.

Ian Cocker removing a bronze ball valve after finish machining on the VMX84SWi

The Hurco VMX84SWi machining centre at Ian Cocker Engineering's Sheffield factory has a 12,000 rpm/ 22 kW, swiveling B-axis spindle, through-spindle coolant and 40-station tool magazine

Ian Cocker continues: "Having the B-axis on the big machining centre was ideal for completing this job, as it avoided having to tilt the components to mill the teeth and also chamfer the end of each tooth.

"Another component recently completed on the machine involved 3+2-axis milling of a test equipment component requiring angled ends and slots. Previously, it took a couple of hours to set up the job on a 3-axis machine, because the part had to be tilted and test cuts made and measured before production could start.

"Setting the same job up on the new Hurco 5-axis machining centre with the help of Renishaw part probing takes about ten minutes, saving an enormous amount of time."

The 2,135 mm x 865 mm x 760 mm travels of the VMX84SWi are more than sufficient to complete all jobs coming from the subcontractor's current customer base. The machine has differentiated the firm from its competitors and allowed it to take on additional, niche work that others cannot tackle.

This advantage is about to be taken a step further. Ian Cocker has recently upgraded the company's OneCNC CAM system for off-line G-code programming to a seat of Open Mind hyperMILL 5-axis CAM software. It provides the ability to produce fully-interpolative 5-axis cutting cycles for running on the new Hurco machine, allowing the subcontractor to accept work requiring complex features and profiling. Despite the VMX 50 being of relatively large capacity, I\n Cocker says that the machine still holds very tight tolerances and that features are routinely machined to within 10 µm, even after eight years of service. The other two machining centres in use at the Sheffield site are a smaller VM3 with a fourth CNC axis and a VM10 3-axis model, installed in 2012 and 2014 respectively, which alleviated the queue of work that was invariably waiting for the VMX 50.

Two components are fixed on the table of the VMX50, one in a 4th axis and tailstock arrangement. Both are condition H900 17-4 PH stainless steel components for an oil industry development project

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Victor gets into a tight spot with new turning centre

The turning line from Victor CNC is renowned for its robust heavy duty characteristics that enable the brand to provide high performance machine tools that can last for a generation. However, such well-built and highly-specified machine tools have historically demanded a considerable floor area - until now.

Rochdale based Victor CNC has launched the new Vturn-NP16 turning centre. This new high performance narrow lathe has an overall length of less than 1.5 m. With a footprint that measures just 1,488 mm in length with a width and height of 1,956 mm and 1,775 mm respectively, even the machine shop with the most restricted space can now benefit from the productivity, rigidity, precision and longevity of a Victor CNC machine tool.

Amazingly, this compact turning centre has a Z-axis travel of 250 mm and a 570 mm diameter swing-over-bed that enables end users to turn components up to 260 mm diameter. Spacious enough to meet the turned part demands of most subcontract applications, the compact footprint certainly sets the new Vturn-NP16 apart from its rivals.

This one-piece slant bed turning centre has been designed with the chip disposal system at the rear of the machine to minimise the footprint. Victor CNC has crammed a host of technology into this small package that also includes a 12 live station servo driven tool turret, which offers the option of a C-axis BMT-45 milling turret for single-hit machining of complex components. The powerful 2.2 kW milling motor is complemented by a main spindle power of 11 kW. This makes the new Vturn-NP16 the ideal choice for heavy stock removal and also highly productive machining of difficult to process materials.

The new Vturn-NP16 is supplied as standard with a 3-step warning light, coolant flush on the Z-axis cover, tool holders, fully enclosed guarding and a hydraulic 6-inch chuck with soft jaws and a FANUC 0i-TF CNC control system. The industry leading FANUC control incorporates the Manual Guide I System for ease of programming. The control and the hydraulic chuck with soft-jaws makes the Vturn-NP16 a turning centre that can be easily mastered by subcontractors that are entry level CNC users whilst more experienced machinists can take full advantage of the capability and rigidity characteristics of the machine.

A number of options are available on the new Vturn-NP16, including a manual tailstock with power quill, manual or auto tool presetter, part catcher, oil skimmer, chip conveyor, air conditioned cabinets, high pressure coolant, bar feed interface, air blast, oil mist collector, auto-doors, C-axis and complete robotic automation. For flexible automated production, Victor CNC can integrate the EWR-03 articulated robot system that can support a maximum component weight of 3 kg with dimensions up to 120 mm diameter. With a part loading/unloading time of just 7 seconds, the EWR-03 can make the Vturn-NP16 the most productive and precise heavy-duty turning centre on the market.

For parts beyond 3 kg that require automation, Victor CNC can integrate a gantry type robot system that can efficiently feed two turning centres to improve productivity rates whilst minimising floor space requirements. With a part changeover time of less than 15 seconds, which includes door open/close cycle, the Vturn-NP16 can tick all the boxes for small to high batch volumes of turned parts.

Victor CNC Ltd, based in Rochdale, Lancashire, is an associated subsidiary company of Victor Taichung Machinery Works Co Ltd. Victor CNC Ltd is the sole distributor of Victor CNC lathes and machining centres in the UK, Eire and selected countries within mainland Europe. In addition, it supplies spare parts throughout the whole of Europe. Since its inauguration, Victor CNC Ltd has seen continuous growth and development, which is reflected in its marked increased market share. Supply, installation and commissioning of machines, as well as technical support through service, spare parts etc., are all supplied direct from Victor CNC Ltd's own base.

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Flexibility and productivity assured

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, has introduced a range of twin-spindle horizontal turning centres into the market.

The Puma TW 2600 series, which includes a machine model (the Puma TW 2600-GL) with an integrated servo-driven gantry loader, provides manufacturers with a high-productivity and flexible machining solution that enables the simultaneous machining of two of the same, similar or different parts. The Gantry Loader model also provides manufacturers with high-speed and reliable part load/unload capability.

The TW 2600 and TW 2600-GL machines are equipped with a 10" chuck as standard and boast rapid rates of 24 m/min (X- and Y-axes) for increased productivity. The machines are compact yet still offer a maximum turning diameter of 360 mm and maximum tuning length of 170 mm for the standard TW 2600 machine and 200 mm and 165 mm for the TW 2600-GL. Performance and flexibility are also assured via the machines' advanced, high-torque 404Nm spindle technology which provides power and speed up to 18.5 kW/3500 rpm and is ideal for heavy-duty machining operations.

The machines are also equipped with two 10-position servo-driven turrets that ensure fast tool indexing and minimise idle (non-cutting) time.

Whilst the TW 2600 delivers exceptional productivity, the TW 2600-GL with its integrated Gantry Loader takes this to a whole new level.

The 3-axis, servo-driven gantry loader integrated on the TW 2600-GL minimises work load and unloading times and can be configured to suit customers, requirements, for example workpiece feeding, unloading and storing positioned left, right or on both sides of the machine.

TW-series machines are also supplied with the Doosan Fanuc i control system and Doosan's Easy Operation Package (EOP) for fast and easy setup and programming.

Tony Dale, Mills CNC's technical director says: "The TW-series is a sophisticated and specialist machine tool range that provides manufacturers with an autonomous and flexible manufacturing cell solution.

The new PUMA TW 2600-GL machine from Doosan

"Manufacturers looking to seriously ramp up production and/or are machining medium-to-high volume parts will be impressed with what the TW 2600-GL can offer."

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MCS puts quality first with latest Miyano

What comes first, the chicken or the egg? Does a company invest to build the business then push to achieve quality supply, or instigate the breeding of quality standards from the outset and use this as the platform from which everything is undertaken for long term planned growth?

This dilemma was overcome by Warren Gray when he took over the day- to-day running of his father's subcontract machinist company Machined Component Systems (MCS) when 'quality first' was his mantra. Indeed, this decision has paid-off with the recent renewal of a long term contract to supply 22 different water pump components which will help take the turnover from £2.5 to £3 million for the 36 people business. This initiated the investment in the latest Miyano BNE-51MSY turn-mill centre.

Warren Gray says: "It's our view that quality should never be an issue for debate in production and we also strictly apply it to procedures involving our suppliers as well."

He outlines as a prime example the most recent installation of the Citizen Machinery UK supplied Miyano BNE-51MSY in the machine shop which has 30 CNC machines in Redditch. Here, the extensive selection procedure involving a turnkey application based proposal followed by full acceptance trials has resulted in a highly successful installation that has proven to maintain consistent production through both day and unmanned night shifts.

Warren Gray, managing director (r) and Andrew Lambert (l) take quality issues very seriously at MCS

Production manager Andrew Lambert was heavily involved, drawing on his previous plant purchase procedure experience in an automotive supplier group. Although nine Miyano fixed head and one Citizen CNC sliding head turn-mill centres are installed alongside other CNC machines, he made an initial enquiry for turn-mill bar machines up to 50 mm capacity able to fully exploit combined operations on the family of brass water pump components:

"With the confidence of a long term contract, price becomes secondary to productivity, so we based our decision on 'efficiency-to-perform', reliability and the level of application engineering involved to give us the level of consistency in production."

Each supplier was given four parts that gave MCS coverage of all the key features over the 22 part family and was told they had a clean sheet of paper with no tie to existing methods or tooling that was used in current production in the works.

Andrew Lambert describes the clean sheet approach by Citizen's application team as: "Impressive and a major factor in Citizen winning the order backed by machine build quality and the levels of flexibility available. Even finer points were considered such as rationalising tooling, the use of an IEMCA Master 80Up 3 m bar feed capable of holding enough bars for a full 12 hour unmanned run, the number of parts achievable per bar, as brass bar ends can work out expensive and the application of coolant and filtration. Very important to us over pure cycle time, was the consistency of the operation and number of parts in the box at the end of the 22 hour production day." Citizen's engineers were also able to produce the four demonstration parts using 80 percent common tools which are all held on the machine to speed change over while helping to optimise spindle utilisation.

Once the machine was selected, Citizen faced a series of staged process capability trials over a four week period attended at different times by setters, operators, and the quality engineer. Warren Gray explains:

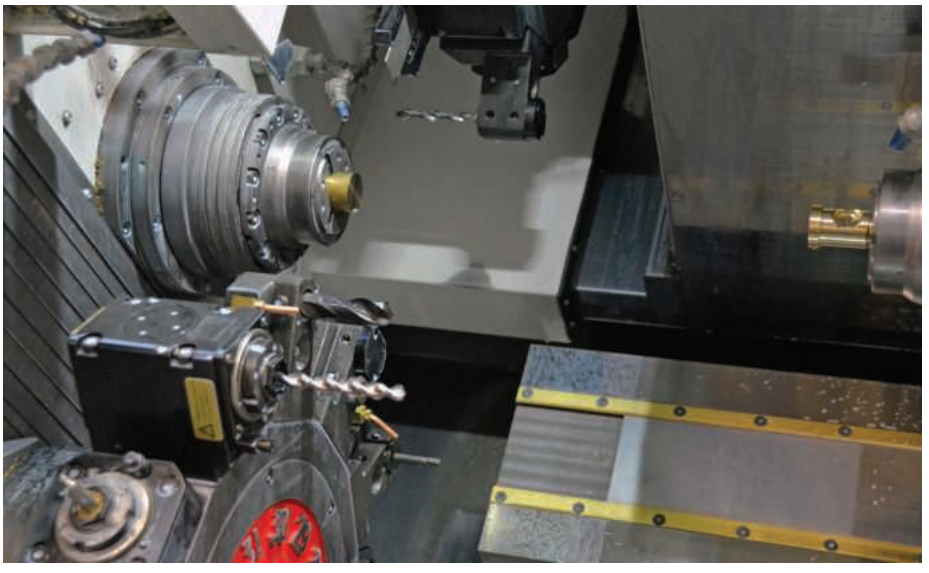
The Bar turn-mill centre Miyano BNE-51 MSY installed at MCS in Redditch

"This was not overkill. We are a small company, not a jobbing shop, but we incorporate large business practices as we produced over 4 million components in 2016. As these were primarily to the automotive sector and suppliers to assisted living technology, we also serve other key sectors such as marine, environmental and white goods, which are helping to provide our organic growth. We also have to meet their strict contract standards.

Once accepted and installed at Redditch, further trials were run under normal production conditions to meet a full uninterrupted shift for each of three most complex components. Andrew Lambert says: "We are achieving exceptional performance from the machine enabling us to confidently maintain a consistent standard even when unmanned through the night with cycle times varying between 90 secs and 220 secs."

As MCS were seeking consistency of production, the eight tonne BNE-51MSY met this need as it is built upon a single heavy slant bed casting with hand-scraped square slideways. These features maximise rigidity, minimise vibration and aid repeatable surface finish and tolerances.

The flexibility of the slant bed configured Miyano, with its two, 12-station all-driven turrets, one with 3-axes of travel, the other with 2-axes available, means it can cut with three tools simultaneously. It has a fixed main spindle with 15 kW drive and a 7.5 kW motor is used on the secondary spindle. Both spindles have a maximum speed of 5,000 revs/min, while both turrets are able to carry multiple tools and service either or both spindles with driven tools powered by 2.2 kW motors having 6,000 revs/min with 25 Nm of torque.



The tooling zone of 12 station all-driven twin turret Miyano BNE-51MSY

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Lentus Composites installs 'rising star' machining centre

For machining pattern board, aluminium mould tools and components made from composite materials, Eynsham-based Lentus Composites has installed a Sahos Dynamic bridge-type machining centre with a 5-metre X-axis. Built in the Czech Republic by Blue Ray, the 5-axis machine was delivered and commissioned in March 2016 by sole UK agent, Asquith Butler.

Simon Odling, managing director of Lentus comments: "There are a number of high-speed machining centres on the market, mainly of European origin, that are directly applicable to production in the composites industry.

"We chose the Sahos Dynamic for a number of reasons. In particular, we felt that the construction of the machine when compared to its competitors was an improvement on the industry norm, providing a stiffer, more stable machining environment.

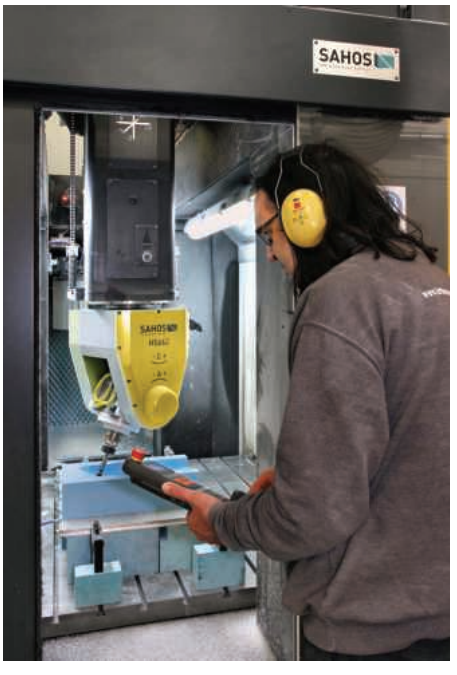
"In addition, we specified direct measurement in all axes including the 5-axis head. These provide absolute feedback and minimise time-consuming maintenance and down-time associated with aligning the axes, as well as providing significantly improved positional repeatability.

"Having tested the market with other local machine users, we received positive feedback from other Sahos machine owners in our sector. The consensus was that this Czech manufacturer is not as well known in the UK as other brands but is a rising star in the industry."

Lentus is in the ascendant as well. Part of Polar Technology Management Group, it is located on Polar's 16-acre site in Eynsham that has planning permission to be developed into a large technology campus within the next few years. Lentus was established as recently as February 2014 by Polar partners Scott Roberts and Mike Dewhirst and is managed by Simon Odling and technical director Paul Lewis. Lentus was formed initially to supply composite products for superconducting magnets used in MRI scanners manufactured in the UK.

The following year, the firm achieved a £2.6 million turnover with 35 staff and has more than doubled the size of its business in 2016 through diversification into industrial, marine, aerospace and automotive applications. Lentus regularly develops and manufactures new composite products for the motorsport sector, from GT and World Rally to Formula 1, as well as for high performance car and electric vehicle producers.

The Blue Ray Sahos Dynamic FC5000 5-axis machining centre at Lentus Composites produces mainly one-off patterns, composite components and aluminium moulds



The machining area of the Sahos Dynamic, showing the A-surface of a pattern for an F1 component being machined from epoxy tool board

Part of last year's success was also down to winning a partnership contract with Cervélo to design, manufacture and test frames for bikes, ridden with great success in track events at the Rio Olympics. The ultra-stiff, laminated carbon fibre frames were machined to close tolerances on the Sahos Dynamic. To improve the performance of the bikes further, Lentus designed and manufactured other weight-saving composite and metallic components.

The rationale for the Sahos machine's purchase was to further develop Lentus' vertical integration, as the ability to deliver the complete supply chain solution, often in compressed timescales, was important. There were already two turn-mill lathes and a mill-turn machining centre with a carbon management package on site, all of which continue to be used, but a dedicated, large-capacity machining facility was needed for composite components and the manufacture of patterns from tool boards.

Lentus has grown rapidly and machining is still split between in-house and sub-contract capacity. Internal capacity on the Sahos machine is used for critical products and short-lead-time projects.

In 2017, a target industry for Lentus will be aerospace, underpinned by legacy experience of the directors in the sector and the company's participation at the Farnborough Airshow 2016. High speed rotating shaft components made from composites is one area of development and a major contract is imminent.

The model chosen by Lentus from Blue Ray's compact, modular range of Sahos Dynamic travelling-gantry, 5-axis machining centres is the FC5000 High 5X. It has a fixed, 5-metre, cast iron table that allows either one long component to be processed, or tandem machining whereby a smaller part is set up at one end while machining of another component is in progress at the other.

Close-up of the 2-axis CNC spindle head on the Sahos Dynamic

A 2-axis, liquid-cooled head, which carries a 24,000 rpm/12 kW spindle motor, provides the two rotary CNC axes, ± 110 degrees in A and ± 400 degrees in C. Control is by a TNC530HSCI from Heidenhain, whose TS640 touch probe for workpiece datuming and TT140 measuring probe for tool wear and breakage detection to minimise spindle downtime are also in use. A 12-position disc magazine is installed for HSK-F63 tools.

The machine is presently operating a single shift at Lentus plus two to three hours unattended at the end of the day. Addition of a second manned shift will be instigated soon and 24-hour operation with a 10.00 pm to 6.00 am ghost shift is planned.

Lentus designs, manufactures and qualifies a broad portfolio of composite products using a range of manufacturing technologies including autoclave/pre-preg, RTM (resin transfer moulding) and resin infusion as well as being experts in the field of filament winding of products such as hydraulic accumulators, pressure vessels, rings, tubes, sleeves and shafts. The company gained ISO 9001:2008 quality management certification in September 2014 and is currently audited under a UKAS accredited scheme by TUV.

Lentus production manager Rupert Truman inspecting a superconducting magnet coil after OD milling in the Sahos Dynamic

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New 5-axis 30-taper mill-turn centre

Brother, the Japanese manufacturer of very high speed machining centres, has introduced an uprated version of its Speedio M140X1 5-axis, 30-taper mill-turn centre. The Speedio M140X2 was launched at Jimtof 2016 last November and is available in the UK and Ireland through sole agent, Whitehouse Machine Tools.

A video of the machine demo-cutting an aluminium component from a solid billet can be viewed at: **https://www.youtube.com/watch?v=_JogzBxM7uA&app=desktop**

Improvements include an integrated, high output, direct drive motor in the C-axis to replace the previous roller drive powering the 2,000 rpm turning table. The A-axis trunnion rotates through a 50 percent larger angle, from +120 to -30 degrees, allowing machining of features at the rear of components and facilitating loading and unloading of parts at the front of the machine.

Furthermore, the A-axis is now tilted by a backlash-free roller drive, promoting high accuracy metalcutting. A holding force of 400 Nm without the need for a mechanical clamping mechanism delivers high speed indexing combined with rigidity when milling parts at an angle or turning them in the horizontal plane.

A new option is a 16,000 rpm BIG Plus face-and-taper contact spindle, which can be specified in place of the standard 10,000 rpm spindle. X/Y/Z travels of 200/440/305 mm remain the same, but the distance between the table surface and the spindle nose has been increased to 455 mm, providing more space for the fixture, workpiece and cutting tool and hence extending versatility of production.

Brother has removed every conceivable element of non-productive time. For example, not only are speeds fast during non-cutting motions, but they also take place simultaneously in X, Y, Z, A and C, together with tool change. The spindle motor's rapid acc/dec and a highly responsive servo control enable a 0.2 second start/stop time. Start-up time of the turning table from zero to 2,000 rpm is less than 0.3 second.

The specification of the Speedio M140X2 includes 0.9 second tool change from the 22-position magazine, giving 1.4 seconds chip-to-chip time. Rapids of 50 m/min in the linear axes help to minimise non-cutting times further, while 30 m/min cutting feed rate maximises metal removal rate. Synchronised tapping is world-leading at 377 m/min peripheral tap speed.

Accessibility for workpiece transfer is ergonomic and the generous door opening can be automated for high production environments or to automate load/unload. Swarf management measures are comprehensive, as befits a machine that is likely to handle large volumes of aluminium chips.

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Protecting your production with Kraft & Bauer

Many engineering companies may not have heard of Kraft & Bauer and yet most are end-users as their fire prevention equipment may be found protecting machines of all types. Major machine tool companies such as Index, Traub, Tornos, Walter, Ewag, Rollomatic and Reishauer fit these systems as standard and every year Kraft & Bauer UK retrofits their fire prevention units to machines of all kinds such as those made by Mazak and DMG MORI.

All UK engineering companies are urged to ensure that their machines are protected against fire risks as demanded to comply with the law and to make sure that the fire systems are then serviced annually, as again required, by Kraft & Bauer UK's specialists. These fire systems are not serviced as part of annual service checks carried out by the OEM machine tool companies' engineers and in the event of a fire incident or insurance check a validated certificate for each machine needs to be provided.

The consensus on risks of fire on machine tools is that any machine that uses oil, machines a self-combustible material such as titanium or magnesium alloys, or produces a spark; proposes a direct risk of fire and this must be protected against. End users of machines can access the "you and the law" pages on Kraft & Bauer's website to learn more

Besides injuries to persons, the consequences to engineering companies in the event of a machine tool fire may be high due to production stoppages leading to insolvency. Many engineering companies think that insurance is sufficient, but don't take into account that unless annual service certificates for the fire systems can be provided any insurance policy is likely to be invalid and even if it is, and a claim is settled without delay, it would take many months before factories and machines may be replaced. Their customers will probably not be prepared to wait and would instead go and find alternative suppliers whilst they were still trying to recover from a fire incident.

Starting from a legal basis, the aim is to protect workers as comprehensively as possible against fire and explosion hazards during the use of machine tools and

manufacturers of machinery and also users of machine tools have key legal obligations. When using flammable metalworking fluids, the employer has the duty to determine within the framework of a risk assessment if a hazard caused by fire or explosions on machines is possible. For this purpose, when purchasing any machine tool, he should firstly ensure that the machine is compatible with the metalworking fluids intended to be used.

So what are the causes of machine tool fires? Most incidents are connected with the generation of incandescent chips, high-energy sparks or hot surfaces, which act as ignition sources. Root causes included broken or worn milling cutters, drills, turning inserts and grinding wheels. As a consequence of technical developments concerning machine tool feeds and speeds together with the trend towards low-viscosity metalworking fluids used at

very high pressures, then the fire risk has increased dramatically in recent years.

In the immediate vicinity of the machining zone a reactive mixture of metalworking fluids and air is formed, which may be ignited by the above mentioned ignition sources. The resulting fire propagates very quickly through the whole interior of the machine tool. The pressure increase accompanying ignition is less important than in the case of an explosion inside a totally enclosed machine. However, due to the pressure increase inside the machine, flame ejections may occur through gaps, pressed-open enclosure doors, feeding and chip removal openings and pressure relief openings, if no relevant provisions are taken.

For the protection of machine tools, automatic fire extinguishing systems with gaseous extinguishing agents, commonly either carbon dioxide or in case of machining titanium or magnesium Argon Gas are used. The legal requirements for fire protection is that if a machine is ran automatically then a fully automatic fire system must be used and if a machine can only ever be ran manually then the fitment of a manually activated system is otherwise sometimes acceptable. However, in both cases the system must be fully integrated

within the machine tool itself and having hand-held or externally used systems is not acceptable.

It also has to be ensured that a fire is detected as early as possible (automatic fire detection) and that the fire extinguishing system is activated without delay and the fire detection elements are a key criterion for fire protection. They must guarantee the safe detection of fires in a fast and reliable way and activate the extinguishing process via the control system. For automatic activation of the extinguishing system thermal heat detection elements are used in conjunction with optical fire detection elements (Infra-Red or Ultra Violet light systems). These are placed within the machine and at other places, where fire hazards exist, e.g. mist extraction systems, chip conveyors, tool changers etc. The sensors are linked to both optical and acoustic alarms that must be at least 5 dB louder than the background noise to alert operators to the fire incident and to warn them to vacate the area.

Mandatory annual maintenance tests have the purpose of the timely detection and repair of damage as well as ensuring safe operation and these are also required by insurance companies.

Machine tools must be tested for fire safety prior to initial commissioning, recurrently thereafter in accordance with the supplier's maintenance specifications (at least annually) and after any maintenance work which may affect safety. For the testing of working equipment, the qualification of the person to be appointed to carry out the test must be validated, with certification

from the fire system manufacture available, and the service company must record the test results. The person carrying out the routine checks must be a "competent person". The records shall be kept for an appropriate period of time with both the end user and the service provider holding copies.

Under the latest legislation the nominated person must carry out the fire risk assessment and then take whatever action is required and to carry out works and install any fire precautions that the assessment recommends. If the assessment fails to take into account any machine tools that may be on-site, and/or then fails to recommend that suitable fire protection equipment is fitted, then it is doubtful that the necessary fire safety recommendations will have been met. In this case anyone not complying with the new regulations faces anything from a fine of £5,000 in a magistrate's court up to an unlimited fine and or two years in prison if the case is held in the high court.

Enforcement of these new regulations is carried out by the local fire authority, that appoints inspectors to enter premises to inspect records and ensure that compliance with the new regulations is being made. Anyone thinking that it's OK as "the company" will foot the bill in the case of an issue is sadly mistaken as in practice the health and safety officer, factory manager, head of maintenance or the owner/directors will more than likely be held personally responsible.

The checks on the correct functioning of the extinguishing system should be carried out at least once a year or as needed (e.g. after fire damage). In practice, the test is generally carried out within the framework of servicing and maintenance work by the installing company. The results of the tests must be recorded in a test book or a test report. The records of the tests should ideally be stored over the whole operational lifetime of the extinguishing system but for at least four years.

Additional information on fire detection and extinguishing systems for machine tools is available from:

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www.kraftandbauer.co.uk

White paper explains machine guarding requirements

The Provision and Use of Work Equipment Regulations 1998, usually abbreviated to PUWER, are UK regulations that are intended to ensure the safety of people at work who are using 'work equipment.' This encompasses everything from scissors to CNC machining centres.

One particular emphasis is on machine guarding, as this is often not understood fully and the consequences of inadequate machine guarding can be very severe or, in the worst cases, fatal.

When is a PUWER assessment required?
Today, standards and regulations tend to take a 'lifecycle' approach. As far as PUWER and machine guarding are concerned, you therefore need to think about all aspects of the 'use' of the machine, from the commissioning, operation, adjustment, cleaning and maintenance, through to the end-of-life decommissioning and disposal.

Clearly if the machine is PUWER-assessed at the commissioning stage or when it is first put to use, that is not the end of the story. Periodic assessments must be conducted to ensure that the safety-related aspects are continuing to perform as required.

For example, guards may sustain damage due to impacts from forklift trucks, or they may be the subject of unauthorised modifications that have the unintended consequence of compromising the safeguarding function. Periodic inspections can identify these situations and others so that rectifications can be carried out in a timely manner before an accident occurs.

Depending on the type of machine, the hazards present, any history of issues coming to light during assessments, and the likelihood of deterioration, PUWER assessments should generally be carried out

every six or 12 months. There are no formal guidelines on this, but 12 months is typical and six months may be more appropriate in some circumstances. On the other hand, little-used, low-risk machines could justifiably be inspected at longer intervals. At the end of the machine's life, the instructions need to be consulted and a risk assessment conducted prior to decommissioning and disposal. Generally the guards will not pose a significant problem during these phases of the machine's lifecycle, but care needs to be taken if parts of the machine are still hazardous when they are exposed by removal of the guards, such as sharp blades, and the guards themselves can be large, heavy and unwieldy.

Which safeguarding measures need to be applied?
For preventing access to dangerous parts of machines, PUWER provides a hierarchical list of measures that can be summarised as follows:
1. Fixed guards
2. Other guards or protection devices
3. Protection appliances (jigs, holders, push-sticks, etc.)
4. Information, instruction, training and supervision

PUWER and CE marking
New machinery in the UK should be CE marked by the manufacturer or supplier, even if the machinery has been designed and built in-house for the company's own use. Bear in mind that the CE mark only indicates a claim of compliance and not all suppliers are as diligent in their CE marking procedures as others. A PUWER assessment of a new machine will often highlight areas of non-compliance, so a close inspection of the machine, including the guarding, is essential.

PUWER assessment documentation
Documenting the PUWER assessment is very important, as this provides the evidence to show that the assessment has been conducted correctly. If photographs are included, these can help to identify whether a machine or its guards have been modified since the previous assessment or if anything has altered externally that could influence the machinery safety, such as low-level barriers being installed adjacent to perimeter guards.

Machine guarding compliance surveys
Procter Machine Guarding offers free Machine Guarding Compliance Surveys of standalone machinery and assemblies of machines, old or new, to support companies' PUWER assessment regimes. After an initial telephone consultation, Procter's safety engineers can make an appointment to undertake a site visit and assess the machinery safeguards. As part of the free survey, the safety engineers provide a short written report that identifies areas of non-compliance and actions that can be taken to reduce risk, improve safety and comply with PUWER. Importantly, rather than just leaving a list of 'problems', the company can also provide 'solutions' in the form of a quote and, if requested, work can be carried out to make the machinery compliant.

The complete PUWER White Paper can be read online at www.machinesafety.co.uk or by contacting:

Procter Machine Guarding
Tel: 02920 855758
Email: guards@procterbedwas.co.uk
www.machinesafety.co.uk

Safety locking of moveable machinery guards

SICK has introduced the TR10 Lock for highly-reliable mechanical locking of moveable safety protection on machinery, such as guards, hoods, flaps, doors and screens.

The SICK TR10 Lock is a safety locking device providing PLe (EN ISO 13849) SIL3 (IEC 61508) protection for personnel and processes through physical locking of moveable safety equipment such as guards and screens to prevent access to, or interference with, machinery in a hazardous area.

Equipped with two Output Safety Switching Devices (OSSDs), the SICK TR10 Lock is a type 4 device (EN ISO 14119) and offers a choice of universally-coded or unique-coded variants. The unique-coded variant accepts only previously taught-in actuators, which means it has a high coding level and therefore removes the need for additional measures for protection against manipulation during mounting (EN ISO 14119). It can be cascaded in series with up to 30 devices in large installations with minimal cabling and connection costs.

"The TR10 Lock features an RFID-triggered solenoid locking bolt that extends into the actuator for physical prevention of opening, or movement, of a safety guard," explains SICK safety specialist, Dr Martin Kidman. "The holding force of 1300 N ensures effective protection and the TR10 can be mounted in several different ways to make it easy to integrate with the machine design.

"The TR10 Lock is especially useful in situations where fault masking may be an issue, since they can be connected in series quickly, easily and independently of control units. The safety level (PLe/SIL3) is not lost because the OSSD semiconductor outputs reliably detect any errors."

"The TR10 locking bolt is only extended when the correct solenoid actuator is detected. It can be used with a universal code for all the actuators in an installation, or coded uniquely to one actuator.

"The RFID transponder OSSD is only triggered when the bolt is fully extended or withdrawn, to eliminate unsafe situations. The high coding level of the actuator means that all of the requirements of EN ISO 14119 can be met without additional measures."

The TR10 Lock is equipped with a bi-stable solenoid, so it uses only a small amount of power and does not produce heat, whether locked or unlocked. Both power-to-lock and power-to-release versions are available. LED indicators signal device status providing fast diagnostics

With four different approach directions for the actuator and a very versatile mounting, the TR10 Lock can be installed in a wide variety of machine situations for proven protection.

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Control machine security protects machine tools

Consequential damage after a collision frequently amounts up to five-digit sums in Euros. This is accompanied by long machine downtimes and unsatisfied customers, because delivery deadlines must be postponed considerably.

BRANKAMP CMS is a simple but highly effective tool for reducing such damage to a minimum or to even avoid it completely. In case of sudden and unexpected collisions the response time of a machine operator lies in the range of a few seconds. Approximately 1 to 10 seconds will elapse before the emergency stop is actuated. CMS reduces this response time to 1/1000 of this time. Valuable time is gained, the stop command is executed much quicker and, last but not least, the damage is limited.

The benefits are determined by the manufacturing task, but include: immediate detection of rapid force changes; minimising subsequent damage caused by programming, setup and operating errors; extending the expected lifetime of your machine; increasing the availability of machine tools; simple retrofitting on existing machines; enabling multi-machine operation and operation during breaks; precautionary measure accepted by property insurances.

For example, if a wrong tool has been inserted, for example an end milling cutter was used instead of a countersink, without BRANKAMP CMS, the wrong tool makes contact with the workpiece. It slowly jams, but the spindle continues to rotate. The force rises suddenly. Further along the line, the end milling cutter is completely destroyed, the spindle clamped and the motor current increased. The machine is switched off by the motor current overload switch. With BRANKAMP CMS, this could have been avoided, as with the optimal limit setting for the tool the machine would be switched off, even before the NC-program started working, but at the latest when exceeding the upper safety limit. Quite expensive machine damage could have been avoided.

The BRANKAMP CMS unit can be installed in the control cabinet or used as a stand-alone device. It can also be integrated into new controls. The shut-down counter shows the total number of standstills. This shows you at a glance how often a crash was detected and how often standstills were prevented. Up to 99 shut-down events are automatically saved with date, time, shut-down value and shut-down limit, without any possibility of manipulation.

With this additional limit BRANKAMP CMS provides protection against consequences from collision damages caused by setup or operating errors. After a shut-down, the machine can only be restarted again by an authorised person.

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ITC sculpts a great future for Digital Fabrications

Before, during and after graduating from the University of Falmouth with a degree in sustainable 3D design, David Forsyth always had a keen eye for turning the most creative of designs and concepts into a reality. Along the path to setting up Digital Fabrications Ltd, the entrepreneur spent time designing and building surfboards, campervan conversions, trophies and much more. Prior to setting up Newquay-based Digital Fabrications, the business owner spent the time teaching students how to use 3D milling machines; a time that also educated him in the value of high quality cutting tools from Industrial Tooling Corporation (ITC) Ltd: "We used high quality cutting tools

from ITC at the university and we always had excellent technical support, so when Digital Fabrications started with its first AXYZ routing machine, ITC was the natural choice for cutting tools," says David Forsyth.

In the three years since its inception, the Cornish business has manufactured mouldings for yachts, bespoke coffee tables, sculptures and signage for retail and exhibition displays. More recent and prestigious projects have involved working with George Clarke on his amazing spaces television series and also sculptor Ben Barrell.

The most recent project with Ben Barrell is the creation of two 7 m high and 1.8 m wide sycamore leaf sculptures for 'The Address Downtown Dubai' hotel in Dubai. 'The Address Downtown Dubai' hotel faces the iconic Burj Khalifa, the world's tallest building. The Ben Barrell sycamore leaf sculpture that is manufactured by Digital Fabrications will be centre stage at this prestige location. When completed, the sycamore leaf sculptures will be planted on a

10 m granite base with an infinity waterfall feature.

Commenting on the unique project, David Forsyth says: "We started with a 30 cm model that Ben designed. We laser scanned the profile and used our Rhino 3D architectural software and Arcam additive manufacturing to build a model for visual reference. The next step was to scale the design up to the full 7 m size. We sliced our model up and fitted it all back together like a 3D puzzle and this was how the full size sculpture was manufactured, in layers."

The layers were machined on the AXYZ 2.4 by 1.2 m bed routing machine. This workhorse was cutting high density foam for over 12-15 hours a day, for almost six weeks. At the sharp-end of this machining process was the ITC Brit Cut range of long series end mills. The creative Cornish business employed an ITC Brit Cut 20 mm 4-flute AlTiN coated square end milling cutter for rough machining the complete profile of the 7 m model. The remarkable scale of the sculpture required the long series Brit Cut 204 Series tool to use its full 75 mm flute length to expedite the rough machining process.

David Forsyth explains: "All our routing tools are supplied by ITC as the technical support from Sally Hunt is second-to-none. In this instance, the long series 20 mm diameter Brit Cut was recommended as the complete flute length could be used for machining whilst the overall length of 150 mm gave us exceptional tool reach for completing each panel in a single setup. Additionally, the rigidity of the Brit Cut eliminated vibration, improved surface finish and more pertinently, the tool life was exceptional tool life as a single Brit Cut tool completed the roughing of the 7m structure."

Once the rough machining process was complete, Digital Fabrications then finish machined the profile of the sycamore leaf sculpture with a 20 mm diameter Brit Cut 204 series ball nose end mill. Like the square end tool, the ball nose used its 150 mm length to reach difficult-to-access features and surfaces whilst the tool geometry and coating technology delivered impeccable surface finishes.

To put the tool life of both cutters into perspective, one 7 m sycamore leaf required three weeks of machining at 15 hours a day. This equates to over 220 hours of machining, something that was completed with just one square-end roughing tool and one ball-nose finishing cutter.

Industrial Tooling Corporation (ITC)
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CoroTurn® Prime and PrimeTurning™

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SANDVIK Coromant

New and innovative coating increases tool life by up to 200 percent

Walter's Tiger.tec gold process revolutionises carbide insert performance

Tooling expert Walter GB has developed a new and innovative titanium aluminium oxide (TiAlN) coating process that revolutionises carbide insert performance by offering life increases of up to a staggering 200 percent.

Compared to inserts that are coated using the conventional chemical vapour deposition (CVD) process, Walter's new Tiger.tec Gold inserts additionally boast higher wear resistance on flank faces, reduced hairline cracking, a greater resistance to plastic deformation, and improved process reliability.

The inserts will initially be available in the WKP35G grade for milling steel and cast iron; other grades will follow.

Recognising that CVD-coated aluminium oxide (Al2O3) inserts had reached a performance plateau, Walter AG set about developing a new TiAlN coating process. By using TiAlN with a significantly high aluminium content of 85 percent, considerably higher than usual, in combination with a new 'ultra-low pressure' CVD process, the company has been able to 'separate' TiAlN for use as the main gold-coloured coating, which is ideal for tool wear indication.

Titanium nitride (TiN) is used as both a key between the carbide base substrate and the TiAlN coating and as the top, textured layer (above the main coating).

In numerous tests at cutting speeds between 120 m/min and 320 m/min on various grades of steel and cast iron, the Tiger.tec Gold WKP35G inserts not only demonstrated extended tool life but also higher wear resistance on flank faces and improved resistance to plastic deformation.

This, says Walter, is attributable to applying the TiAlN coating by the 'low pressure' CVD procedure, which subjects the inserts/coatings to compressive residual stress rather than tensile residual stress.

Walter's new Tiger.tec Gold inserts are initially available in WKP35G grade for milling steel and cast iron.

The construction (above) of the Tiger.tec Gold inserts, shown below in a Walter Blaxx M3024 milling cutter

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High-feed milling - the key to increased productivity

Seco Tools provides one of the widest ranges of high-performance high-feed milling cutting tools on the market, covering an impressive diameter range from 1 mm to 208 mm.

This range of high feed milling tools is always being refined, upgraded and improved. As part of this continuous improvement programme the company has introduced two new ranges to its high feed milling tools' portfolio.

The range comprises a number of Seco's proven and most popular milling tools and holders that include Jabro™ solid end mills, Combimaster®, Minimaster® and Minimaster® Plus, Easy Shrink® and Highfeed 2, 4 and 6.

High feed milling is a roughing method designed to help manufacturers achieve higher metal removal rates and, as a consequence, reduce component cycle times and optimise productivity.

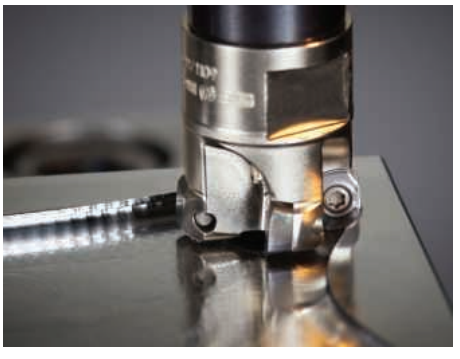
JHF181 provides a specific high feed geometry for machining hardened steel, super alloys and titanium. JHF181 is available in diameters ranging from 2 -16 mm and is ideal for machining small workpieces and cavities.

The HF6 range consists of shell end mill bodies with fixed pockets and strong negative inserts with six cutting edges. HF6 tools have a wide application range and are especially suited for the machining of P and K materials.

Even though high feed milling is principally described as a 'roughing strategy', with the right cutting tools, it is possible for manufacturers to create near 'net' shapes in fewer passes and move from roughing to fine finishing - negating the need for, as well as the time and expense associated with, semi-finishing operations.

The process can be applied to good effect when machining a wide range of materials and offers particular advantages when machining difficult-to-machine materials (i.e. ISO M, S and H). As such, high feed milling is used increasingly in the aerospace, medical and mould tool and die sectors.

High feed milling is a generic 'catch-all' description that includes a range of specific milling operations, i.e. face milling, copy milling, pocketing, helical interpolation, slotting, copying, plunging etc.



The process itself is particularly beneficial when machining deep pockets with long tool overhangs, because employing a shallow depth of cut results in low radial cutting forces and virtually zero vibration. which, together, ensure high process stability, increased tool life and improved productivity.

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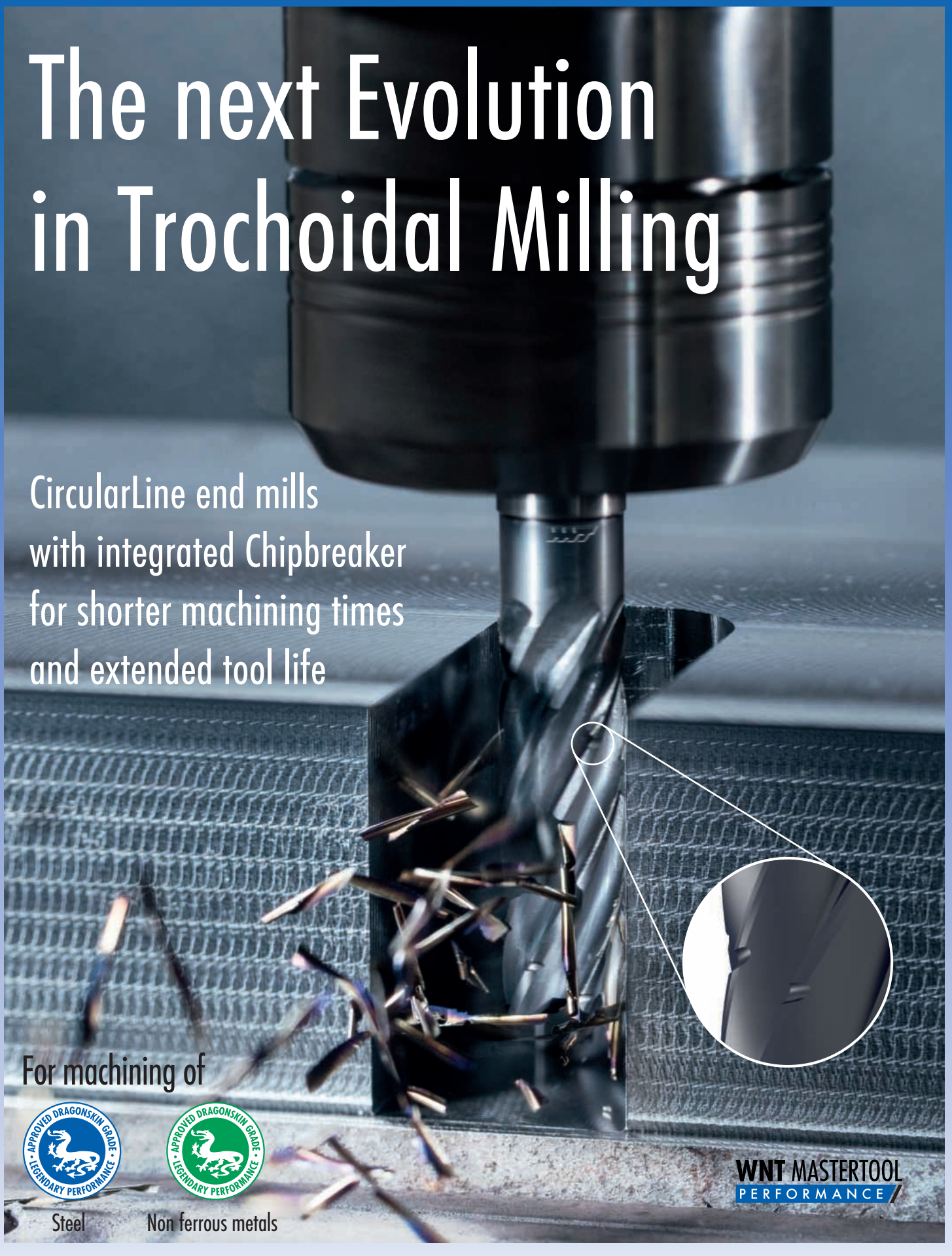
The next Evolution in Trochoidal Milling



CircularLine end mills
with integrated Chipbreaker
for shorter machining times
and extended tool life

For machining of

Steel

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WNT (UK) Ltd. • Sheffield Business Park • S9 1XU Sheffield • Tel. 0800 073 2 073 • wnt-uk@wnt.com • www.wnt.com

Investment and WNT (UK) expertise pave the way to success for SPE

With over 30 years of steady, managed growth under its belt, Staffordshire Precision Engineering had expanded to such an extent that its manufacturing was spread over three separate buildings in Stoke on Trent. So when in 2014 the new premises in nearby Newcastle under Lyme became available, brothers Gary and Phil Smith took the decision to relocate under one roof. Following an extensive refurbishment of the building, they moved lock, stock and barrel in January 2015. This was the start of a new chapter in the business that would see it develop, both in size and diversity of customer.

With Gary and Phil Smith now heading the business, started by their father Stan back in 1981, the relocation provided a perfect opportunity to restructure the business. In addition to the £1,250,000 cost of the building, refurbishment and relocation, partly supported by a Regional Development Grant, the company also invested in new machine tools, spending £900,000 to bring its total number of machines to 50 with the addition of two Mazak CNC lathes, a Star sliding head lathe and two Mazak 5-axis machining centres, including a 3 m bed Mazak VTC 800.

Major investment in machine tools has taken place at SPE Ltd

This new capacity helped with the existing markets that SPE Ltd worked in, such as aerospace, where it is AS9100 approved and the scientific and medical equipment sector, where it focuses on lower volume, high value speciality engineering. The larger capacity also created opportunities in the automotive arena, where it is now a Tier One supplier to two prestigious car manufacturers. Since the relocation turnover has grown to £3.7 million, an increase of 20 percent, and it has been recognised as the Manufacturer of the Year 2016 by the Staffordshire Chamber of Commerce.

"This was a serious investment, but one that started to pay off almost immediately. The additional capacity of the 3 m machining centre opened up new doors for us," says Gary Smith. "We have never had a machine that has brought in so much work. It is now at capacity and a second machine will be ordered in the very near future. The investment we made wasn't just about buildings and machines, though."

The move gave SPE Ltd the platform to win new business, which has come from the automotive and motorsport sectors, where it counts two Formula One teams among its customers. This new business brought new demands, however, as materials such as carbon fibre and titanium became regular projects for machining.

"While we have a highly skilled workforce, enhanced by our apprentice scheme which has produced 50 percent of our workforce and our first apprentice is still with us after 34 years; we recognised that we needed to bring in new ideas in order to maximise the better workflow and working environment that we now have," explains Gary Smith.

WNT tools are available 24 hours a day via the Tool-o-Mat vending service units

One of those changes was the appointment of Lee Sambrook as technical director, who was given the brief of improving OEE (Overall Equipment Effectiveness) develop processes and streamline manufacturing. Tooling was a major part of that responsibility and he called on WNT (UK), as he had worked closely with it before to assist in reducing overall tooling costs and improving metalcutting performance.

"In my previous experience with WNT, I was confident that they were a leader in the machining of titanium and stainless steel and we have worked together on specific components and projects. Overall we are seeing a 35 percent improvement in productivity on these materials and in some cases this is as high as 80 percent," says Lee Sambrook. Assisting with this are WNT application sales engineer Steve Warner, who spends one day a week at SPE Ltd and technical sales engineer Derrick Jones, who helps oversee the consignment stock of tooling in the two WNT Tool-o-Mat vending service machines.

Prior to Lee joining SPE Ltd, it had around 15 different tooling suppliers. Now, with the technical support that it is receiving from WNT and the regular visits from Steve and Derrick to look at process improvement, it is standardising all tooling to WNT and managing tools using the Tool-o-Mat vending service.

"The vending and consignment stock is a significant advantage when it comes to component lead times, we can be machining parts within an hour of the program being written as stock is constantly monitored and updated, allowing it to evolve with the projects that we get involved with," says Lee Sambrook. "Operating 24 hours a day, five days a week, we need to know that tools will be available when we need them and with the Tool-o-Mat vending service we never have any issues. We can also monitor tool costs through our systems and allocate costs to jobs."

WNT's involvement with SPE Ltd goes beyond providing technical support and new tooling. It also provides a regrind service on its solid carbide tooling and from the beginning of 2017 will also handle the recycling of all of its indexable insert carbide.

Lee Sambrook concludes: "Reducing our tooling supplier list from 15 down to, effectively one with WNT (UK), has streamlined our activities and delivered significant efficiencies to the business. The ongoing technical support is also a major factor in us winning new business as we are confident that the cycle times we are quoting are achievable and highly competitive."

Technical support at the machine from WNT has delivered significant productivity gains at SPE Ltd

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CoroMill 390 Silent Tools bring security to titanium pocket machining

In response to both the growth in quantity and complexity of structural aerospace components, an updated range of CoroMill® 390 Silent Tools™ has been developed by cutting tool and tooling systems specialist Sandvik Coromant. The upgraded Silent Tools dampening technology will allow machine shops to machine deep pockets on titanium aerospace frame parts with greater security and higher metal removal rates.

"Driven by increasing passenger travel demand and accelerated asset replacement cycles, the commercial aerospace sector is expected to continue its decade-long trend of above-average growth rates," says Thomas Wikgren, product manager Shoulder Milling at Sandvik Coromant. "In tandem with more advanced component design, including the increased deployment of deep pockets in structural parts (to save weight and fuel), there is a corresponding need to produce these features as efficiently as possible while maintaining the highest quality levels. As a result, CoroMill 390 end mills with integrated damping Silent Tools technology have been updated to take pocket machining to the next level."

The CoroMill 390 is now available with improved Silent Tools technology, for more efficient machining of parts such as engine mounts as well as deep pockets on titanium frame parts for the aerospace industry

Pockets are the most common feature in titanium structural parts for aircraft, often featuring depths of more than four times the diameter of the cutter, which is significant in such a challenging material. For this reason, there are high demands for process stability and quality, as well as metal removal rates.

With these factors in mind, the development of an effective cutting tool offers machine shops the opportunity to achieve genuine competitive gain. CoroMill 390 Silent Tools provides light-cutting insert geometries and high performance grades that deliver low cutting forces and vibration-free machining for secure, cost-effective milling.

The new CoroMill 390 Silent Tools can be ordered in diameters from 20 to 32 mm. It is available for both the new insert size 07, as well as insert size 11, with options for either cylindrical shank or Coromant Capto® coupling.

Find out more at:
www.sandvik.coromant.com/en-gb/products/silent_tools_milling/pages/default.aspx

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Horn expands production and administration facilities

Tübingen-based Paul Horn GmbH ended 2016 by moving into two new buildings for production and administration, doubling the German precision tool company's manufacturing capacity. The investment amounted to more than EUR 70 million.

Managing director, Lothar Horn says: "We are investing in our future. It will be especially beneficial for our customers as we continue to focus on speed of response to orders, top quality and precision."

Covering an area of 3,500 m² across six floors, the new administrative building houses not only offices but also seminar rooms for customer and staff training. 120 employees moved into the building in December 2016.

The new, 20,000 m² production facility is located next to the existing factory. Completed and occupied in the summer of 2016, the two-storey structure houses tool holder manufacturing, the tool coating department and logistics.

The new production building has 1,100 m² dedicated to the coating department, twice as much as before. To supplement the nine coating systems it already had in place, Horn has invested in three new stations featuring HiPIMS technology. They are used to manufacture more complex coatings, to generate coloured layers and top coats and to increase coating productivity.

The new production building at Paul Horn GmbH in Tübingen

Horn has 75 machining centres, turning machines and other machinery for in-house production of all its toolholders and additional equipment. Automated guided vehicle systems are to be introduced in spring 2017 to transport materials, production orders and tools around the site, signalling a move towards Industry 4.0.

With its capacity tripled, the new logistics centre is able to process customer orders quickly and deliver tools even faster. The fully automated handling system in the finished goods warehouse enables orders to be picked and despatched quickly. The new warehousing system for high-speed storage and retrieval of products underpins Horn's need to process approximately 96,000 production orders annually. The standard product catalogue currently includes more than 20,000 different tools. In addition, over 120,000 custom-made tooling solutions are available.

Machinery on the ground floor of the production building

An active supporter of BlueCompetence, the sustainability initiative of the German Mechanical Engineering Industry Association (VDMA), Horn is integrating modern systems for saving and recovering energy into the new production building. A combined heat and power (CHP) plant has been installed to recycle unused waste heat for cooling in summer and heating in winter. The CHP facility also generates electricity from gas at an efficiency of 90 percent. Energy-saving LED lighting is used throughout the building.

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ITC extends popular aluminium milling line

As a best-selling cutter in the portfolio of aluminium machining end mills from Industrial Tooling Corporation (ITC), the 3081 Cyber Series has now been extended with a variety of corner radii. The development engineers at ITC have worked closely with end users to further enhance this already exceptional line of solid carbide line of end mills.

Until now, the three fluted centre cutting 3081 Series from ITC was available in diameters from 3 to 20 mm with an optimised cut length from 12 to 40 mm. The enhanced tool geometry and cut length combines with polished high-helix flutes to demonstrate impressive material removal rates, chip evacuation and tool life. For customers that wanted to extend tool life further, the 3081 Series also has the option of a DLC coating for more abrasive applications.

The Tamworth manufacturer has now extended the range by adding a series of corner radii to each diameter increment. The market leading series is available in diameters of 3, 4, 5, 6, 8, 10, 12, 16 and 20 mm. While the new additions retain the same diameter range; the series has been more than quadrupled in size to accommodate at least four corner radii for each tool diameter. Tool diameters from 3 to 5 mm are now offered with a 0.25, 0.5, 0.75 and 1 mm radius. Tool diameters from 6 mm and above also incorporate these radius increments, while extending the radius options with 0.25 and 0.5 mm increments up to a maximum radius of 5 mm on the 200 mm diameter end mill.

The extension of the 3081 Cyber Series demonstrates ITC's commitment to evolving its product portfolio to meet the ever changing needs of the end users. The additions to the 3081 Series now makes this industry leading range of end mills the tool of choice for all your aluminium machining needs. You can take a look at the huge portfolio of ITC aluminium machining cutters at **www.itc-ltd.co.uk** or by contacting:

Industrial Tooling Corporation (ITC)
Tel: 01827 304500
Email: sales@itc-ltd.co.uk

MAPAL launches new drill for high performance steel drilling

The latest addition to the MEGA-Drill Series from MAPAL, the new MEGA-Drill-Steel-Plus drill, launched at the recent AMB Show, is now available for the UK market. This new drilling line is the ideal choice for reliable cost-effective drilling of steel.

As the next generation of this drill, the MEGA-Drill-Steel-Plus offers users a significant boost in wear resistance and performance through its modified cutting edges, chip flutes and twin cutting edge geometry. Utilising new optimised chip flute geometry and a newly developed coating, this combination with the modified cutting edge preparation can deliver tool life improvements of 50 percent. In addition, the new series can increase cutting speeds and feed rates by more than 15 percent compared with its predecessor. The result is a lower cost-per-part and greater cost-effectiveness for the user.

MAPAL has an extensive line of MEGA-Drill options that include individual series for inconel, aluminium, hardened steel, Inox, composite materials and much more. However, the new MEGA-Drill-Steel-Plus series has been developed with a material composition, a new TiAlN coating technology and geometry that will undoubtedly exceed existing performance levels for end users when machining steel.

Incorporating a 140 degree point angle and a side rake angle of 30 degrees, the drilling line is available with 3 X D, 5 X D and 8 x D options to ensure customers optimise rigidity and performance for all their steel drilling operations. The drills are available in a diameter range from 3 to 25 mm with drills from 3 to 12 mm offered in 0.1 mm increments. Larger diameters are also available in a variety of diameter increments. Offered in HA and HE shank forms, the MEGA-Drill-Steel-Plus has through coolant facility to improve swarf evacuation and prevent re-cutting of chips.

Depending upon the chosen drill diameter, the 3 X D series is available with an overall length from 62 to 153 mm with a drill flute length from 20 to 96 mm, while the 5 X D drill provides an overall length from 66 to 153 mm with a flute length from 22 mm to 101 mm. The extended 8 X D series has an overall length from 72 to 243 mm with a flute length from 34 to 190 mm. Each of these drill and flute lengths has been scrutinised and optimised by the development engineers at MAPAL to maximise drilling performance, tool life and hole concentricity and precision.

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A strengthened partnership and new acquisition

HAIMER signs a cooperation agreement with DMG MORI, becomes its Premium Partner and acquires Microset GmbH

The cooperative partnership between the HAIMER Group and DMG MORI has been further strengthened. Both companies signed a cooperation agreement which sets the standards for a premium partnership of HAIMER products. Furthermore, on the 1st of January 2017, HAIMER acquired the DMG MORI Microset GmbH company, which is now operating under the name HAIMER Microset.

Successful machining requires both powerful machines and highly-precise tool holding technology, which ensures that the precision is transferred from the spindle right to the cutting edge. That is why the business relationship between the HAIMER Group, an international leader in high-precision tool holding, and DMG MORI, a global leader in machine tool manufacturing, has been very successful and trustworthy for many years.

With the acquisition of DMG MORI´s Microset Tool-Presetting Technology, the HAIMER Group, a family-run company with nearly 600 employees, complements its existing product portfolio. In addition to high-precision tool holders in all popular interfaces and lengths, the current product portfolio includes a variety of shrinking and balancing machines.

Claudia Haimer, CEO of HAIMER, explains: HAIMER Microset GmbH, with about 35 employees, will remain in Bielefeld, Germany. This will be our second HAIMER production site, including our main headquarters in Igenhausen, Augsburg, Germany. The Bielefeld facility will be further expanded to become our Northern Germany sales and marketing hub, where we will be able to present the complete process chain that surrounds the machine tool to current and prospective customers. We are looking forward to the long-term development of the new HAIMER facility together with the employees in Bielefeld and an intensified partnership with DMG MORI."

The cooperation agreement establishes an even stronger relationship between the two companies with a Premium Partnership. Henceforth, DMG MORI will purchase all products related to tool presetting, balancing and shrinking including shrink fit holders as well tool rooms exclusively from HAIMER. All DMG MORI technology and solution centres and production plants worldwide will be equipped with HAIMER products.

"We are looking forward to a successful cooperation together with HAIMER as a Premium Partner," says Christian Thönes, CEO of DMG MORI AG. "We will present our first joint products regarding the Smart Tool Management as early as the 2017 EMO show in Hannover."

The cooperation agreement additionally means that DMG MORI will continue to display HAIMER Microset products during exhibitions and Open Houses and will continue to distribute these products through their worldwide sales and service companies.

Andreas Haimer, managing director and president of the HAIMER Group, further added, "HAIMER Microset tool presetting technology complements our existing portfolio of high-precision tooling, shrinking and balancing technology perfectly, thereby making us a system provider for tool management around the machine tool.

"HAIMER Microset tool presetting technology complements our existing portfolio of high-precision tooling, shrinking and balancing technology perfectly, thereby making us a system provider for tool management around the machine tool."

The partners are looking forward to the Microset-Deal and Cooperation Agreement: (from left to right) Dr. Maurice Eschweiler, member of the board DMG MORI AG, Claudia Haimer,CEO of HAIMER GmbH, Christian Thönes, chairman of DMG MORI AG, Andreas Haimer, managing director and president of the HAIMER Group

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Outside, a slim heat shrinking contour, inside, clever hydraulic expansion technology

With the SCHUNK TENDO Slim 4ax hydraulic expansion tool holder, it is now possible to combine the complete outside geometry of heat shrinking mountings according to DIN 69882-8 with the proven qualities of SCHUNK hydraulic expansion technology. The slim precision mounting makes it ideal for use in series production, particularly in the automotive industry. It was particularly designed for axial operations and shows its strength during milling close to interfering contours, countersinking, and reaming in 5-axis centres and the die and mould industry.

Test series prove that the mountings with the vibration-damping properties of the hydraulic expansion technology have considerably improved the process during milling operation. The hydraulic expansion tool holder design reduces peak cutting amplitude of the force progression in Y-direction, which results in less deflection of the tool. By reducing the load of the cross cutter and the cutting edge, considerably longer service life can be achieved. Additionally, the user benefits from having exact gauges for holes and maximum precision at the workpiece.

Easy exchange via Plug & Work

As with every SCHUNK TENDO hydraulic expansion tool holder, the SCHUNK TENDO Slim 4ax also has permanently high run-out accuracies, perfect vibration damping, and a fast tool change with a wrench. Even narrow shape and position tolerances can be met precisely, therefore investments in high-priced peripheral devices are not required. Since the precision mounting can replace conventional heat shrinking toolholders by Plug & Work without having to reprogram the machine, the benefits can be tested in a real application.

The SCHUNK TENDO Slim 4ax can be used without expensive peripheral devices. The MQL-capable mounting is dirt-resistant and is extremely low-maintenance. In contrast to the heat shrinking toolholders, it has a permanently high run-out accuracy of < 0,003 mm at an unclamped length of 2.5 x D and a balance grade of G 2.5 at 25,000 rpm, the SCHUNK TENDO Slim 4ax seamlessly fits into the proven hydraulic expansion toolholder program from SCHUNK. In the first step, the mountings are available for the interfaces HSK-A63 with ø 10 mm/L1=120 mm, ø 12 mm/L1=90 mm, ø 12 mm/L1=120 mm, ø 14 mm/L1=90 mm, ø 14 mm/L1=120 mm, and ø 20 mm/L1=90 mm. Further variants with ø 6 mm bis 32 mm and L1-dimension of 90 mm, 120 mm, and 160 mm are already planned.

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Thame Workholding Inoflex chuck aids Micron Precision

Based in an impressive, 5,000 sq ft manufacturing facility in Brixworth, Northamptonshire, Micron Precision Engineering Ltd has earned a reputation for supplying its customers with high-quality components at a cost-effective price and in a timely fashion.

To enable the efficiencies that allow economical prices to be quoted, and to facilitate the prompt production of high quality parts, the company has made regular investments in advanced machine tools. Micron Precision Engineering Ltd now boasts an impressive range of highly efficient 3-, 4- and 5-axis CNC milling, 3- and 4-axis CNC turning facilities.

To release the full productive potential of the company's new 5-axis (DMG Mori DMU75 Monoblock) machine tool, Micron Precision Engineering Ltd recently invested in an advanced InoFlex concentric and compensating 4-jaw chuck from Thame Workholding.

Stuart Denton-Beaumont, general manager of Micron Precision Engineering Ltd, explains: "Our new, large capacity 5-axis DMG Mori / DMU75 machine tool has the capacity to machine components of up to 840 mm diameter, 500 mm long with a maximum weight of 600 kg and is capable of producing a wide range of work including round, rectangular and geometrically irregular parts. As standard chucks are somewhat limited, we searched for a secure, fast and flexible workholding method to help ensure the new machine's efficient operation. A visit to an exhibition provided the answer we were looking for.

"Gareth Barnett, the sales manager of Thame Workholding recommended and demonstrated the capabilities of the Inoflex 4 jaw self-centering chuck. As the Inoflex is able to securely hold a wide range of odd shapes and is extremely versatile, we were happy to place an order.

"Now fitted, our VD050 Manual closed centre 4-20 inch capacity Inoflex chuck, has proven to be easy to use, fast to set up and very repeatable. Although most of all, we have been impressed by its adaptability and ability to securely hold any shape of component. Now, our new machine tool and the use of our Inoflex 4 jaw self-centering chuck have enabled us to take on a range of additional work.

Stuart Denton-Beaumont says: "When purchasing new equipment, we look to deal with companies who are able to deliver technical support and to adapt their products to our own specific needs. We have been impressed by the advice and the service we have received from Thame Workholding, in addition to help in other areas, Thame has designed and manufactured bespoke jaws for our Inoflex chuck to suit a particular application."

Gareth Barnett, Thame Workholding sales manager, says: "In the past, companies have used rigid concentric 3-jaw chucks for clamping round parts and worked with two-jaw vices for rectangular and geometrically irregular parts. Now, the current trend is towards combined turning and milling machines for the production of round, rectangular and geometrically irregular parts. Thame Workholding has reacted to these developments by offering the first universal clamping tool for clamping circular, rectangular and also asymmetrical shaped parts."

Available exclusively in the UK from Thame Workholding, the Inoflex concentric and compensating 4-jaw chuck is unique, in that it is able to securely hold such a wide variety of dissimilar shaped parts.

The use of this cost-effective all-rounder, means that users no longer need expensive special clamping solutions as, in addition to securely clamping round, cubic and geometrically irregular parts, the Inoflex also delivers high levels of repeatability and roundness accuracy on deformation-sensitive workpieces. The ingenious chuck, is available in a manual format from Ø 160-1200 mm, and as a power chuck from Ø 210-1000 mm, and can be used on all modern machine tools.

Based in Long Crendon, Buckinghamshire, Thame Workholding manufactures and supplies a wide range of cost-effective standard and bespoke workholding products to its global customer base. In addition, the company provides a range of highly efficient workholding solutions from leading manufacturers such as Lang Technik, Horst Witte, Samchully and HWR Spanntechnik, on an exclusive UK agency basis.

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ETG gets a grip on clamping

Coventry-based ETG Workholding has been appointed the exclusive UK supplier for the German Spreitzer range of precision tools, specialising in the development and manufacture of standard and complex solutions in the field of clamping and measuring.

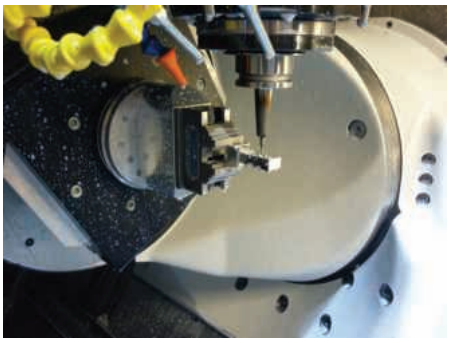
Established in 1983, Spreitzer's areas of expertise range from modular clamping systems and modular construction systems for machining centres to manual quality control and bespoke equipment including mechanical clamping systems. Spreitzer is also an innovator and a product range that ETG Workholding will be particularly promoting will be the MZR range of mechanical centre vices which uniquely, offer the ability to securely clamp raw material workpieces without the need for pre-stamping.

ETG Workholding's Product Manager Rob Beckett explains: "There are many options for raw material clamping but the vice is only part of the solution. Raw materials mostly need pre-stamping, which adds further cost over and above the purchase cost of the vice and adds time to what is essentially a very straight forward operation.

"MZR vices are ideal for working on multi-axis machining centres," he adds "as they are a compact design with a small trunnion footprint yet still offer maximum access and the ability to enlarge the clamping width with reversible jaws."

Raw part machining (first setup) uses the grip jaw option with the second setup for finish machining using the smooth jaw option, all without pre-stamping. Depending on the jaw clamping width selected (4 options between 70 and 195 mm), a maximum clamping force of 40,000 N is achievable. This exceptional grip contributes further to reduced cycle times enabling raw workpiece materials to be rapidly positioned, clamped and positioned ready for machining.

Rob Beckett concludes: "Our agreement with Spreitzer is exciting as it brings a whole new range of high quality German manufactured equipment to the UK at very competitive prices. It fits perfectly with ETG Workholding's philosophy of only offering quality products and we will be adding to the Spreitzer portfolio throughout 2017 to create a highly comprehensive workholding range."



MZR vices are ideal for use with multi-axis machines

ETG Workholding experts have first-hand experience of a wide range of clamping and fixturing techniques and can be contacted to discuss specific requirements or undertake demonstrations.

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FARO's speed and accuracy gives OAL 'food for thought'

Peterborough, UK-based OAL has been involved in designing, implementing and automating innovative engineering solutions for the world's food industry for more than 20 years. The company boasts a unique range of competencies, including automation, design, mechanical capabilities and product development. The scope of the company's in-house skills allied to two decades of in-depth experience means that OAL's specialists have a thorough understanding of the majority of systems that are used in a food manufacturing facility.

OAL counts some of the world's largest food producing corporations as customers and has delivered a range of projects, including advanced materials handling solutions, to some of the largest installations in the UK. To ensure that the company continues to be regarded as a leader in its chosen field, OAL makes regular investments in advanced technology that helps guarantee the quality of its work and enables the efficient completion of its projects.

The requirement to speed-up the laborious measurement and drawing process that takes place prior to embarking on a plant installation or system modification recently prompted the purchase of a Focus3D X 30 laser scanner from FARO UK.

Jake Norman, OAL innovation and marketing manager explains: "In an ideal world every factory would have accurate, fully dimensioned 2D/3D drawings of every aspect of each facility, so that proposed plant modifications could be easily assessed and defined. In reality, the first steps when considering remodelling a plant to meet the demands of new products, often involves an extremely time-consuming measurement and drawing process.

"We believed that for complex plants these crucial procedures were taking too long and that at times it was difficult to achieve the desired levels of dimensional accuracy. This lack of visual dimensional information often meant that initial discussions related to new layouts, at a senior level, were delayed or made more difficult by relying on inaccurate layouts.

"We have since transformed our measurement and drawing processes with the purchase of a FARO Focus3D X 30 laser scanner.

"The use of our Focus3D, purchased from FARO UK for 3D factory scanning, now provides us with fast, precise 2D/3D drawings and layouts. We can now quickly and deliver a complete 3D "walk-through" model of the factory with full point measurement to an accuracy of 2 mm. Our specialist team can visit a facility and rapidly and precisely scan a single area or the entire site.

"Depending on the facilities' equipment complexity and size, sometimes we need to make multiple scans. At each position the scanner captures an impressive 976,000 measurement points per second in a full 360° data capture. Once multiple scans for a single area have been finished, the team completes a post processing routine to register millions of data elements, enabling the creation of a scanned 'point cloud.' At this stage a full '3D walk through' of that area is available. We then repeat the process for other areas of the factory under measurement with post processing, including joining individual 'point clouds' together, creating a 'project point cloud' of the entire site.

"The key benefits of using the Focus3D X 30 include the creation of 3D layouts to the required accuracy, the ability to dimension and annotate any 3D element and to create an accurate, realistic 3D 'walk through' of the 'as installed' plant.

"Now, all plant remodelling is based on accurate data so the entire design process is much quicker, whilst accurate information is available for optimal reverse engineering. Finally, at the project installation stage, the availability of accurate data ensures that our new parts fit first time."

Combining the highest-precision scanning technology with true mobility and ease-of-use, the FARO Focus3D X 30 laser scanner, as purchased by OAL, enables fast, straightforward, and accurate measurements of objects and buildings. It precisely records architectural and as-built features, complex structures, production and supply facilities and large-volume components and delivers realistic and true-to-detail scan results.

Paul Woolner, OAL lead designer, adds: "Prior to our laser scanner purchase, we used a laser tape measure to measure facilities prior to designing and installing new plant or modifying existing plant. Although this system was able to provide fairly good results we felt that a laser scanner would be able to considerably improve our accuracy capability and slash the time taken to capture the required results. Now in regular use, our FARO Scanner has delivered in both areas. Also, given the size and complexity of many of the plants that we need to measure, our ability to now remotely scan them, rather than access them physically, is proving much safer.

"Following the on-site training provided by FARO UK staff, our team soon became familiar with the equipment's basic functions. As the device is very easy to use, through the course of our work we soon became proficient in its more advanced functions. The personnel who had the initial training have been able to pass on their knowledge to other colleagues. Now 20 OAL staff are able to use the FARO scanner.

"Although the scanner is also used in-house, it is easy to transport and quick to set up it is used predominantly onsite. In addition to its practical use, when employed at our customers' premises, our FARO equipment gives our customers assurances related to OAL's professionalism and our quest for high levels of accuracy."

FARO develops and markets portable CMMs (coordinate measuring machines) and 3D imaging devices to solve dimensional metrology problems. Technology from FARO permits high-precision 3D measurement, imaging and comparison of parts and compound structures within production and quality assurance processes. FARO devices are used for inspecting components and assemblies, production planning, documenting large volume spaces or

structures in 3D, and more. FARO's 3D measurement technology allows companies to maximize efficiencies and improve processes.

The fast and accurate Focus3D X Series laser scanners offer all of the advanced features expect from professional 3D laser scanners, with FARO's established and well-known level of simplicity. As the smallest and lightest laser scanners on the market the robust and quick to set-up Focus3D X Series are ideal portable measuring tools for both indoor and outdoor applications.

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Force measurement on the move

Starrett to introduce portable and hand held force measurement at Control 2017

Metrology and measurement specialist, Starrett is exhibiting at Control 2017 at the Stuttgart Exhibition Centre, Stuttgart, from 9-12th May. The company will be showcasing its wide range of force and material testing solutions and video measurement machines, as well as introducing a line of portable and hand held force measurement tools at stand number 6536.

Starrett has exhibited at the show for many years, and will be using the platform of Control 2017 to introduce a new addition to its force measurement range.

The Jedburgh-based company will showcase its well-established force and material testing systems, that have been specifically designed for high volume production and quality control testing at the event. The latest product to be added to the force measurement range will expand the company's offering by supporting quality assessors who need force measurement on the move with portable and hand-held machines.

"While force measurement machines that perform batch testing are vital, there is a need for QA testing on a much smaller, more portable scale," said John Cove, Starrett marketing manager. "A QA inspector on the shop floor needs force measurement at his fingertips for efficiency and research and development professionals need to be able to test on a small scale. In these situations, relying on a large, immobile machine is impractical. This is why we have developed a range of hand-held and portable devices that will provide highly accurate data on the go.

"Control 2017 is the ideal platform to unveil our new products, as it brings together QA professionals from all around the world. The exhibition always provides excellent business and networking opportunities for Starrett, and we're looking forward to developing new client and distributor relationships at this year's show."

In addition to its force and material testing range, visitors to Starrett's stand can also see its metrology machines in action. To find out more, or to arrange a meeting with Starrett's experts at the show, contact:

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Aberlink CMM passes 'Xtreme' shop floor test

The remarkable sales success of Aberlink's recently launched Xtreme coordinate measuring machine has justified the company's contention that industry needed a cost-effective, robust CMM that could provide accurate measurements at the point of manufacture. In addition to satisfying the needs of accurate shop-floor measurement, the speed of Aberlink's advanced new CNC driven CMM allows parts to be inspected within machine tools' cycle times.

Typical of the early users of the unique Aberlink machine is Holtex Engineering Solutions, a precision engineering firm based in Holmfirth, West Yorkshire. Having been attracted by the publicity related to the CMM, Holtex Engineering Solutions' director, Ben Robinson requested a demonstration.

In anticipation of high levels demand for Xtreme demonstrations and given that many potential users are unable to visit Aberlink's regional demonstration facilities, Aberlink produced a number of small, portable versions of the CMM. These quarter size machines allow Aberlink sales representatives to carry the technology demonstrators in their cars, to visit potential customers' premises and to prove the outstanding capabilities of the Xtreme CNC CMM on potential customers' own parts. The 'plug and play' nature of the Xtreme demonstration units makes any visit and demonstration a very quick process.

Ben Robinson explains: "We manufacture a large variety of high-end, high-precision complex components, as one-offs and in small batches. Previously we used manual metrology equipment, although a growing order book and rising pressure on our quality control facilities meant that we needed to automate as many of our inspection tasks as possible. In addition, the demanding nature of our work meant that we needed a CMM that would provide the required levels of precision.

"Although we considered other brands, we were aware of Aberlink's excellent reputation and had also received recommendations from several Aberlink users that we know. As we were too busy to travel to an Aberlink facility for a demonstration, it helped that our local Aberlink representative was able to bring a small Xtreme demonstration unit to our premises.

"A thorough in-house demonstration was able to prove the Aberlink CMM's capabilities and to convince us that the Xtreme was perfect for our needs. We were therefore happy to place an order.

"Now located on our shop floor, the Xtreme CMM has proven very easy to use, extremely accurate and, due to its CNC nature, extremely fast. As our machine operators have responsibility for the quality of their own output, they have quickly mastered the use of the Xtreme and make regular use of the new CMM. Typically our personnel will use the Xtreme to measure first-offs before commencing on production runs, and to make occasional in-process checks.

"Our new Aberlink CMM is also used for final inspection tasks by our quality personnel. As we have written programs for repeat work, we are now able to load multiple parts on to the machine, recall the applicable program and to perform fully automated final inspection routines.

"The use of the new Aberlink Xtreme has increased our inspection precision capability and speeded-up both our production and inspection routines. Our new CMM can be seen as a commitment to help preserve our reputation for the quality of our work."

The advanced new 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. In addition, the CMM's integral temperature compensation function ensures that accuracy is maintained even when the surrounding ambient temperature is not controlled.

Ensuring greater user productivity and profitability, the Xtreme utilises Aberlink's popular 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.

Now the largest UK-owned CMM manufacturer, Aberlink's comprehensive range includes 29 standard sizes of both CNC and manual CMM variants. Aberlink CMMs enable the precise measurement of the smallest of components, to parts of over 3 m long and up to 6 tonnes in weight. Customers are able to select from a wide range of probing and non-contact measurement options and on-machine fixturing. The company's wide range of available solutions allows Aberlink to offer high quality CMMs and vision measuring systems to suit all applications and budgets. Based in Eastcombe, Gloucestershire, Aberlink has established a global reputation for the company's metrology products which are innovative, easy-to-use and competitively priced.

Aberlink Innovative Metrology LLP Tel: 01453 884461 Email: chris.davies@aberlink.co.uk www.aberlink.com

New laser scanning technology for portable measuring arm systems

The latest ROMER Absolute Arm from Hexagon Manufacturing Intelligence features a newly developed integrated high-speed laser scanner.

Long established as the world's leading portable measuring arm that combines integrated probing and scanning functions, the ROMER Absolute Arm with Integrated Scanner (SI) now features the brand new RS4 scanner.

With completely new optics and electronics, the RS4 scans more than 60 percent faster than its predecessor, with performance particularly improved when measuring difficult object surfaces such as carbon fibre or machined steel. The RS4 has an ultra-wide laser line that is almost double the width of the previous model, as well as a lower point resolution, giving users greater point cloud detail in significantly less time than before.

"The new RS4 laser scanner has been designed to stay one step ahead of the rapid growth in laser scanning that we've seen over the last few years" says Anthony Vianna, product manager for the ROMER Absolute Arm range. "We want our customers to be able to scan more and scan faster, so we've looked to improve our performance on all fronts, while keeping all of the qualities that made the previous model stand out from the competition."

As with every ROMER Absolute Arm model, scanner warm-up and time-consuming scanner calibrations remain unnecessary. The longer stand-off of the RS4 also allows users to scan more deeply into difficult to reach cavities than before, with no reduction in accuracy performance.

The RS4 laser scanner will now be fitted to every 'SI' model ROMER Absolute Arm, and will also be available as a retro-fit product for existing ROMER Absolute Arm SI owners looking to upgrade their scanning performance.

The ROMER Absolute Arm SI featuring the new RS4 scanner is available to order worldwide from today via local Hexagon Manufacturing Intelligence sales offices and dealers. Shipping will commence immediately.

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, Hexagon's expertise in sensing, thinking and acting, i.e. the collection, analysis and active use of measurement data, gives its customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

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Ford tests large scale 3D printing with light weight and personalisation in mind

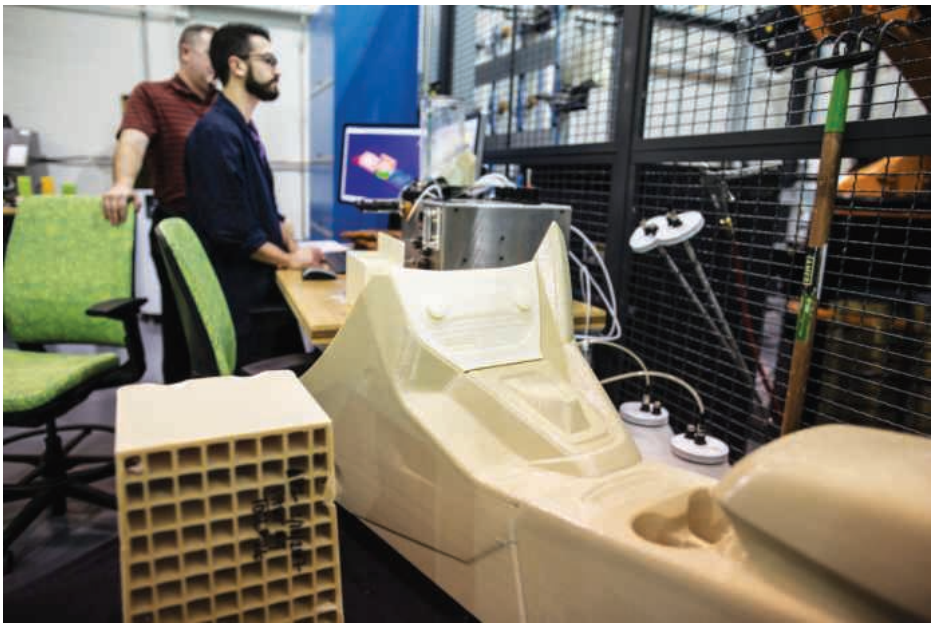
Ford Motor Company is testing the 3D printing of large scale car parts using the Stratasys Infinite Build 3D printer. Ford is the first automotive company to trial this technology with Stratasys and is currently exploring potential applications for future production vehicles, like Ford Performance vehicles or for personalised car parts.

Increasingly affordable and efficient, 3D printing of large car parts, like car spoilers, could benefit both Ford and consumers. Parts that are printed can be lighter in weight than their traditionally manufactured counterparts and may help improve fuel efficiency.

Capable of printing car parts of practically any shape or length, the Stratasys Infinite Build system could be a breakthrough for vehicle manufacturing, providing a more efficient and affordable way to produce tooling, prototype parts, or components at low volumes.

"With the Infinite Build technology, we are now able to print large tools, fixtures, and components, making us more nimble in design iterations," says Ellen Lee, Ford technical leader for additive manufacturing research. "We're excited to have early access to Stratasys' new technology in order to help steer the development of large scale printing for automotive applications and requirements."

The new 3D print system is located at Ford's Research and Innovation Center in Dearborn.



An emerging technology for manufacturing

As 3D printing becomes increasingly efficient and affordable, companies are employing this emerging technology for manufacturing applications in everything from aerospace, to education, to medicine. Wider adoption in 3D printing has been driven by recent technology advances, new areas of application and government support, according to Global Industry Analysts Inc. By 2020, the global market for 3D printing is expected to reach $9.6 billion, the organisation reports.

In the future, 3D printing could have immense benefits for automotive production, including the ability to produce lighter-weight parts, which may help improve fuel efficiency. A 3D-printed spoiler, for instance, may weigh less than half of its metal-cast equivalent.

Additionally, 3D printing is a more cost-efficient way to produce parts only needed at low volumes, like prototypes and specialised parts for race cars. Further, Ford also may use the technology to make larger printed tooling and fixtures as well as personalised components for customers.

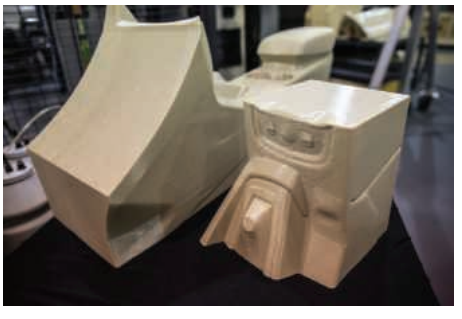
How it works

Specifications for the part are transferred from the computer-aided design program to the printer's computer, which analyses the design. Then, the device goes to work, printing one layer of material at a time, in this case, plastic, and then gradually stacking the layers into a finished 3D object. When the system detects that the raw material or supply material canister is empty, a robotic arm automatically replaces it with a full canister. This allows the printer to operate for hours or days while unattended.

Benefits of 3D printing

Although 3D printing isn't yet fast enough for high-volume production manufacturing, it is a more cost-efficient way to produce parts only needed at low volumes, like prototypes and specialised parts for race cars. In addition, when not limited by the constraints of mass production processes, components can be designed to function more efficiently.

Using traditional methods, an engineer would create a computer model of the part and wait for months for prototype tooling to be produced. With 3D printing, Ford can print the same part in days at a significantly reduced cost. For example, a prototype for a new intake manifold could be produced over a couple of days as opposed to several months, at an order of magnitude lower cost.



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DMG MORI helps Sheffield Hallam University develop its advanced manufacturing capabilities

Investment in DMG MORI machines at Sheffield Hallam University brings the latest CNC turning technology to the over 700 students each year who study engineering in all its forms, including aerospace, mechanical, manufacturing and materials.

Ian Broome, senior technician, engineering in the Faculty of Arts, Computing, Engineering and Science at the university says, "We needed to update the machinery in our workshops to provide the best and most up to date facilities for our students. Investing in DMG MORI turning centres makes us compatible and in line with much of the technology currently used in industry. Not only will this give our students an advantage in finding employment once they have completed their courses, but it will also give employers increased access to the type of skills that are most relevant to their businesses."

Sheffield Hallam University invested in two DMG MORI turning centres, one with Y-axis, driven tooling, a maximum turning diameter of 400 mm and part catcher, the second, a 2-axis turning centre with a maximum turning diameter of 200 mm and 30 m/min rapid traverse on all axes. Both machines have optimised cast iron beds for the best stiffness and vibration characteristics. Ball screws of the highest quality and linear roller bearing guideways are combined to meet the highest standards in production. The Siemens controls on the two machines are compatible with the other CNC controls used at the university, maintaining continuity for teaching.

Ian Broome adds: "Having the right equipment attracts students and is an important part of ensuring they get the best value for their investment in training. For us the training we received from DMG MORI made it easy for us to get running and demonstrated that programming Y-axis complex parts was straightforward."

Around 40 percent of the available machine time is used for teaching. The remaining time is used for the production of prototypes for students in design and engineering, to manufacture their final and midterm projects. It also supports research within the university and in the manufacture of complex components for the Formula Student racing car competition.

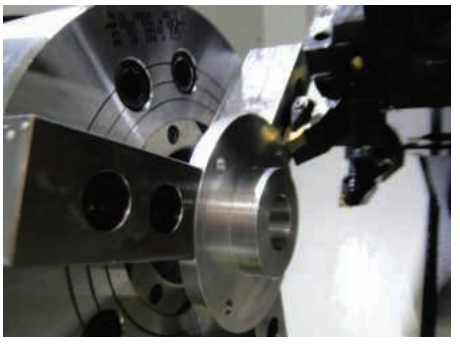
Machining parts on the DMG MORI turning centre at Sheffield Hallam

Previously, much of this work was subcontracted as was the manufacture of tensile testing samples and compression platens. Moving the manufacture in house reduces costs, speeds up the response time for part manufacture and increases skill levels and learning opportunities.

Ian Broome says, "During our Open Day, we made over 200 parts, which featured turning and impressive rigid tapping operations. The parts were perfect every time, demonstrating the possibilities opened up by the technology, for more advanced manufacturing within the university and its courses."

When choosing which machines to invest in, Sheffield Hallam University wanted to include as much advanced technology as possible in each machine. The DMG MORI machines provided the optimum solution, comprising reliability, Y-axis and driven tooling, considerably more power than their previous machines, high pressure coolant, a futuristic aesthetic design and large viewing window, ideal for a teaching environment.

Ian Broome continues: "The advanced design of these machines will future proof the workshop. They are easy to programme on the control, including any complex rotary milling or drilling operations, and the simulation gives us absolute confidence in



the machining results. The power of the machine is exceptional, enabling us to perform cutting operations which would have been impossible on our old machinery."

As part of their courses, students participate in work placements with local industry in a knowledge transfer partnership. The two DMG MORI machines will play an important role in the development of these partnerships, benefiting both the company involved and the university and contributing significantly to student development.

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Revolutionary adjustable spectacles benefit from FANUC alliance

Getting a product from the drawing board to production can be a daunting task, especially when it is a new product from an early-stage company with little volume manufacturing experience.

In instances such as this, manufacturers require a lot of advice, support and guidance from suppliers to help them make informed decisions on the materials, technologies, processes and concepts needed to get the product to market.

Identifying and establishing a close working relationship with a supplier(s) that can fulfil these requirements are essential. However, working with a company that is recognised as one of the world's leading suppliers in several of the required disciplines and that boasts a longstanding partnership with a plastics automation specialist can be a huge bonus.

Adjustable spectacle manufacturer, Eyejusters was founded with a simple objective: to create affordable, innovative, adjustable glasses. A pair of glasses is potentially one of the most life-transforming products available. Sadly, hundreds of millions of people in the developing world live without the glasses they need because there are no optometrists to measure and provide prescription glasses. Eyejusters believed there had to be a way to address this problem and make this product available to everyone, hence the development and subsequent launch of the Eyejusters range of adjustable spectacles.

The journey from this simple objective to a quality, production-ready range of spectacles would draw heavily on FANUC's expertise in injection moulding and robotics. It would also use automation partner Hi-Tech's skills in 3D simulation and its experience in defining a robust production automation concept.

At the heart of the Eyejusters product is its revolutionary SlideLens™ Technology, a lens with a special profile containing both positive and negative power areas. When two of these lenses are placed together, the positive and negative power areas cancel each other out. When one lens is then moved across the other, the amount by which they cancel each other out varies, changing the focus.

EYEJUSTERS SlideLens technology comprises of two movable optical lenses, a protective rear cover and an adjustment dial. All parts are injection moulded.

A focus on moulding

Injection moulding optical lenses is always a challenging process, but the Eyejusters design presented unique challenges that could only be overcome through ongoing product and process development by both Eyejusters and FANUC. The key objective was, of course, to produce optically perfect lenses. However, in order for the Eyejusters design to work it was critical that they were also as thin as possible, so that the two lenses, plus the protective rear cover, remained aesthetically neat and compact.

Because the unique Eyejusters lens design has special varying thickness profiles, it is almost impossible to mould the lens with conventional injection moulding techniques. This is because the injection melt front tends to move around the thicker sections before completing the fill at the thin sections, which, in this case, are located in the centre of the lens. Using conventional techniques, it is highly likely that problems with quality, such as hairline marks and air traps, would be present. - These characteristics are clearly unacceptable in an optical lens.

To eliminate problems such as these and develop a robust production solution, FANUC supported Eyejusters over an extended period, running a series of moulding development tests. At the same time, Eyejusters themselves strove to perfect the tool design so that it could work in combination with the unique CNC ROBOSHOT special functions, gradually calculating the workable boundaries to achieve the thinnest possible and highest quality lens product.

The outcome of this process development exercise was a final production solution comprising a special patented mould design, combined with ROBOSHOT's precision 'Pre Injection / compression' function. The material was injected into the tool under reduced clamp force. At a precise injection point, full clamp force was then applied to compress the moulding as injection completed. The precision nature of the ROBOSHOT CNC control meant selected positions to control the process were repeatable within 0.001 mm.

Developing the production solution

With the lens moulding techniques and processes fully defined, the next stage was to consider the integration of the injection moulding process within a production cell.

Hi-Tech Automation was tasked with developing a working specification, selecting the technologies for each of the production processes and steps and building the production cell shown here

This would also need to contain the additional technologies and processes required to assemble and finish the lens modules. It was at this point that the long-standing partnership between FANUC and Hi-Tech Automation became an essential element of the finished product. Hi-Tech Automation has amassed years of experience within the plastics sector and, as a certified FANUC Strategic Partner, the company has an intimate knowledge of FANUC's robot range, making Hi-Tech a valuable addition to the overall project team. This effectively seamless partnership between the different FANUC business areas, ROBOSHOT and Robotics, together with Hi-Tech, proved to be highly beneficial to Eyejusters, as all of the expertise required for the project resided within this close-knit team.

As the "product" was the only fully-defined element of this project, Hi-Tech's initial task was to develop a working specification for each of the production processes and steps. This would require day-to-day liaison with Eyejusters personnel to review each step and make decisions on processes, specifications and parameters.

The first step was to determine how best to remove the individual mouldings from the tool. In this instance, the team decided it would be beneficial to have the individual moulded parts attached to a runner / sprue for handling and orientation purposes. This would allow the parts to be removed, transported and handled safely through subsequent processes, without the need to touch the critical optical surfaces. The robot gripper systems were therefore designed, manufactured and integrated into the robots.

Now that the first task in the automation process had been resolved successfully, the team could turn its attention to the subsequent processes which needed to be considered, evaluated and fully defined, including: lens coating, component de-gating, ultrasonic welding and final packing into thermoformed trays.

Hi-Tech turned to FANUC's unique ROBOGUIDE simulation software to design, model and create the layout virtually. Using ROBOGUIDE, the various elements of the system could be tested and developed before any equipment was ordered or manufactured. Further benefits included the ability to evaluate and determine accurate cycle times and to generate the robot programmes offline.

As with any optical product, cleanliness was a key consideration and the techniques used for de-gating and welding would have to eliminate the potential for the contamination of the lens components by particulate matter. Hi-Tech selected laser de-gating and ultrasonic welding processes to perform these delicate operations because they were clean and precise.

The finished and assembled product is placed into a thermoformed tray by one of the robots in the production cell

With the automation cell built and operational, a Class 5 Clean Room needed to be built around the cell before production level components could be produced. Hi-Tech specified a solution that met all cleanliness standards and incorporated full air handling through entry and exit air locks, thus allowing the cell to begin production.

This partnership approach has proven to be highly successful for Eyejusters, allowing them to get the product into volume production, while safe in the knowledge that all of the key parameters such as quality, performance and predictable productivity levels have been met.

Each of the partners in this venture has since been recognised for its individual contribution and commitment at the Plastic Industry Awards. FANUC received the award for Supplier Partnership – Prime Machinery and Hi-Tech received the Automation for Supplier Partnership – Ancillary Machinery award. Eyejusters also received the award for Best Business Initiative of the Year.

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EOS "Additive Minds" supports Audi with systems, processes and knowledge building

AUDI and EOS develop partnership focused on holistic approach for metal-based additive manufacturing

AUDI AG based in Ingolstadt, Germany, one of the leading manufacturers of premium automobiles, has started a development partnership with EOS, the global technology and quality leader for high-end Additive Manufacturing (AM) solutions. The EOS consulting division "Additive Minds" is supporting Audi in the holistic implementation of this industrial 3D printing technology and the development of a corresponding 3D printing centre in Ingolstadt.

Güngör Kara, director of Global Application and Consulting, comments: "The aim is to not only supply Audi with the right additive systems and processes but to also support them during applications development, when building up internal AM knowledge and training their engineers to become in-house AM experts."

Toolmaking and casting technical centre to drive development forward

Very early, Audi recognised the potential of additive manufacturing for the automotive industry, and now promotes the application of the technology, working closely with EOS. On the part of Audi, the sectors of tool making and the casting technical center for planning have a leading position. Industrial 3D printing is first being applied to equipment and prototype building at Audi, as well as motor sports, where the technology is already in use today. Based on industrial 3D printing, Audi can revolutionise the process of tool manufacturing. When the component geometry or assemblies are very complicated, the technology will make possible the production of geometries that would have to be joined in conventional manufacturing. Here, 3D printing has an advantage. The design determines the production; not the other way round.

Dr. Stefan Bindl, team manager Innovation Center, Additive Minds, comments: "Audi was looking for a reliable development partner and has found that in EOS. We are very happy about that. The close cooperation concerning application and process development as well as internal knowledge building makes a significant contribution, which is why Audi can quickly achieve substantial effects for their own business by applying our technology.

"Obviously, the geographical proximity to one another facilitates our close cooperation significantly."

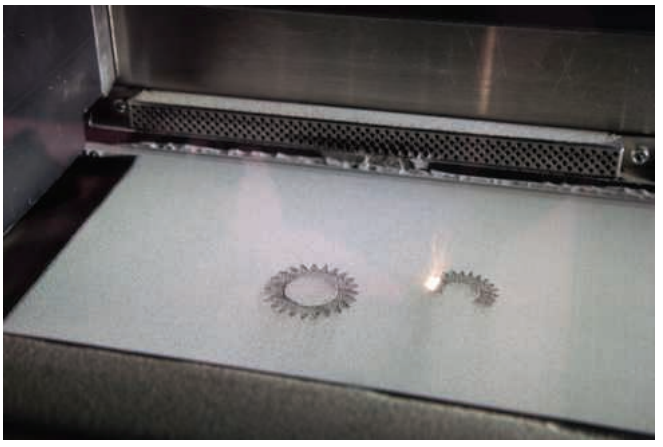
Jörg Spindler, head of toolmaking at Audi, says: "We have set up our own competence center for 3D printing in order to gain experience with the materials and the process, and to further develop them for series production. A close cooperation with AM solution providers such as EOS, who can support innovation in technology development, is essential for these aims. With this technology we are able to integrate internal structures and functions in

tools that we have not been able to create so far with conventional manufacturing methods. Especially with components in small batches, we can now produce components using lightweight construction, quickly and economically based on this technology.

Manufacturing parts and vehicle components additively and more cost-effectively

In application of additive manufacturing, Audi is also focusing on the production of inserts for die casting molds and hot working segments. The company can positively influence the process of series production by conformal cooling, producing parts and vehicle components more cost-effectively. This is made possible by using highly complex, additively manufactured cooling channels, which are tailored to the component and could not be implemented conventionally before.

Specifically, the optimised cooling performance leads to a reduction of the cycle time by 20 percent which has a positive effect on the energy consumption and cost efficiency of the components at the same time.



EOS is a global technology leader for industrial 3D printing of metals and polymers. Founded in 1989, the independent company is a pioneer and innovator for holistic solutions in additive manufacturing. Everything EOS does is founded on the cornerstones of corporate responsibility and sustainability, both inward- and outward-facing, whereby EOS embraces a deep commitment to customers and their needs.

EOS is mastering the interaction of laser and powder material. Additionally, EOS provides all essential elements for industrial 3D printing. System, material and process parameters are intelligently harmonised to ensure a reliable high quality of parts and thus facilitating a decisive competitive edge. Furthermore customers benefit from deep technical expertise in global service, applications engineering and consultancy.

EOS nurtures a vibrant ecosystem of partners and, by means of venture investments, helps incubate promising start-ups. It is this interaction along the whole industrial value-chain that enables the development of extensive solutions for 3D printing, thus contributing to the further digitisation and automation of manufacturing.

EOS Electro Optical Systems
Tel: 0049 89893 362134
www.eos.info

HK3D introduces new low-cost metal 3D Printer to the UK

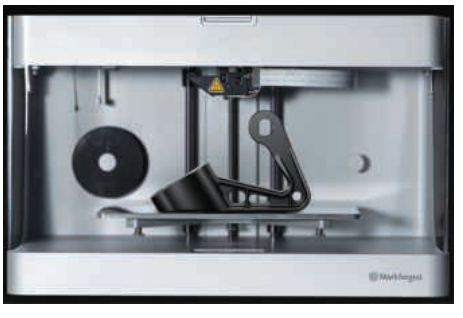
Unlike existing 3D print technology, the new Metal X from USA company Markforged uses a ground breaking new printing process that has the unparalleled benefits of rapid material changeovers, health and safety benefits from the elimination of powder consumption and a price entry point below £90,000, something unheard of in the metal-printing sector. All this is backed by expert service, support, training and consumable sourcing from HK3D.

The new Metal X machine introduces a new Atomic Diffusion Additive Manufacturing (ADAM) process that prints parts using a bound metal powder rod that transforms into a dense metal part in one easy step. Bulk sintering provides crystal growth through all axes giving your parts excellent mechanical properties in all directions. The ADAM process also enables the creation of unique geometries such as closed-cell honeycomb infill, which are not possible using traditional subtractive manufacturing processes or DMLS. Furthermore, this ADAM process eliminates the requirement for metallic powder consumables and the subsequent health and safety concerns. Using nylon reels infused with metallic powders, the Metal X can be used in the office environment alongside your PC.

The Metal X greatly accelerates innovation, delivering metal parts overnight using a new technology at a fraction of the cost. The Metal X can currently print with 303 and 17-4 stainless steel with beta testing underway for 6061 & 7075 aluminium, A2 & D2 tool steel, Inconel 625 and Titanium Ti-6Al-4V. The diverse composition of these materials makes the Markforged Metal X the only 3D printing machine you will ever need for designing and developing prototypes and small batch production of all your complex parts.

With a 50 micron resolution layer height, the Metal X has a work envelope with a width of 250 mm, a depth of 220 mm and a height of 200 mm, delivering sizeable parts for most industry sectors.

The Metal X gives customers complete control with in-process inspection that enables users to scan parts 'mid-print' using Markforged's cloud-based Eiger software and a laser displacement sensor that is fixed to the print head. This guarantees dimensional accuracy and permits in-print inspection of the most critical tolerances at any point in the print process.



This remarkable new technology is now available to order for September 2017 delivery from HK3D.

A brief video can be viewed at:
https://www.youtube.com/watch?v=QANmSuO5Jcl

HK3D
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PSL Datatrack provides complete production control to Sub-CNC

Sub-CNC Precision, a privately owned subcontractor specialising in the machining of high quality turned and milled components, has invested in PSL Datatrack production control software to provide greater control over the business, improve efficiency and save time, whilst maintaining a highly reliable service to all customers in terms of both product quality and customer service.

Over the last five years, Sub-CNC has invested in the latest production technology, remote monitoring services including CCTV and machine diagnostics to support unmanned machining. Investment in PSL Datatrack software for stock control, work in progress and scheduling control, as well as other administration tasks, is now making a major contribution to the company's continuing success.

Sub-CNC supplies turned parts in high volumes and provide a stock holding service for its customers. This has proved popular, particularly over the last 18 months, helping the company to secure longer-term orders and giving customers the benefit of next day deliveries and cost reductions for higher volumes. State-of-the-art Citizen & Miyano machine tools enable Sub-CNC to achieve competitive cycle times whilst PSL Datatrack enables efficient workload planning throughout the workshop.

Prior to investing in PSL Datatrack, Sub-CNC used a combination of Word and Excel files to manage the administration of the business. This approach required a lot of repetitive data entry, had become very time consuming and, as the business grew, was prone to error even for simple tasks such as producing delivery notes and certificates of conformity.

George Dingley, director of Sub-CNC, recalls: "By the end of 2014 the order throughput and document management of our thriving business had become a handful using our existing in-house system and we took the plunge to get on board with PSL Datatrack.

"The facility to have accurate data, a complete component stock list, and a stream-lined delivery process was very appealing. I had used a different system at a previous company and also had an online

demonstration of another, but we felt that neither of the other systems focused on what we were trying to achieve. We wanted a system designed for our business, not some huge management system with every bell, whistle and a long learning curve for our staff."

Both PSL Datatrack and Sub-CNC Precision are members of the BTMA. Informal preliminary discussions had already taken place, but it was at a MACH exhibition where PSL Datatrack were exhibiting that George's eyes were opened to the flexibility that PSL Datatrack manufacturing software could offer. Sub-CNC Precision was attracted by the flexibility of being able to add features and modules to the system as and when a need arose or their business developed further. PSL Datatrack was very helpful in assisting Sub-CNC to gain grant funding towards the project.

Sub-CNC invested in modules to control Quotations, Sales and Purchase Order-processing, Works Orders, Material Stock, Component Stock, Delivery Notes and Invoicing. Having total control and traceability over every aspect of putting a job through the workshop is a major advantage. There are time savings at every corner and ISO 9001 recertification, which is vital to the company, is now "a breeze by comparison."

The flexibility and timesaving from using the Quotations module is a major benefit.

Converting quotations into job cards has been another huge time saving tool. These used to be manually generated in Word and invariably would wait until there was a window of spare time for someone to devote to the task. In extreme cases, this could have eaten two weeks into a four-week lead-time on an order before the job card was available on the shop floor, becoming quite stressful during busy periods. Orders are now processed within minutes of them arriving and are acknowledged to the client so that they know it is being dealt with promptly.

PSL Datatrack provided comprehensive support to Sub-CNC at all stages of the purchase and implementation process, particularly to ensure that external documentation was clear and well presented.

PSL Datatrack
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Materialise enhances 3D printing options at the MTC

Global 3D printing software and services provider Materialise is bolstering the Additive Manufacturing (AM) offering at the Manufacturing Technology Centre (MTC). Materialise is providing its world-leading Magics 3D Print Suite software to the MTC, home of the National Centre for Additive Manufacturing in Coventry, after becoming one of the MTC's newest members.

The Materialise Magics 3D Print Suite is pioneering technology driving forward new solutions across a range of industries such as automotive, aerospace and manufacturing, which complements a number of the markets the MTC work in. Founded in 1990, Materialise joins a growing number of MTC members involved in AM, and will bring its years of expertise in delivering AM solutions to the MTC.

Materialise has brought together the largest group of software developers in the industry and one of the largest 3D printing facilities in the world. Its end-to-end software and manufacturing services act as the backbone of the 3D printing industry, helping its customers unlock the full potential of 3D printing from design concept to production. Additive Manufacturing will play a major role in digitising manufacturing, as it enables new and better designs to be realised with enhanced productivity and greater sustainability. The MTC, part of the High Value Manufacturing Catapult which is supported by Innovate UK, has been at the forefront of developing new technologies and providing manufacturing systems solutions since opening in 2011.

Ross Trepleton, group technology manager for component technology at the MTC, says: "The MTC uses Materialise software to produce build files efficiently and accurately for right first-time AM component manufacture. The software suite enables high control of the 3D printing process from enhancing the design to streamlining production and analysing machine behaviour, upskilling our customers' understanding of the entire AM process chain."

With the move in the AM industry towards production, quality, repeatability and process control become increasingly important. Now, the MTC will have access to the Control Platform and Inspector software, tools that allow the user to analyse data coming from all stages of the production process in order to improve and guarantee part quality. Users can experiment with print styles and other research parameters, as well as predict and detect errors with less effort.

Materialise UK Ltd
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www.materialise.com

Introducing the ORLAS CREATOR 3D metal

O.R. LASER unveiled its new direct metal additive manufacturing platform and ecosystem, developed and designed for small and medium enterprises, at Formnext 2016.

With a production strategy in place and a well-earned reputation for meeting its machine production commitments, O.R. Laser plans to begin shipping the ORLAS CREATOR during 2017.

When O.R. LASER first began researching direct metal AM more than three years ago, the main focus quickly became to make the technology capabilities more accessible. Considerable market research demonstrated that metal AM had tremendous potential for small and medium sized enterprises (SMEs), particularly in the jewellery, dentistry, and medical sectors, as well as for smaller engineering firms and laboratories. However, until now, this size of organisation has been priced out of the metal AM market with no commercially viable options available to them.

This is precisely the type of organisation that O.R. LASER had in mind when developing the ORLAS CREATOR and the ecosystem around it.

With an impressive and contemporary design, the ORLAS CREATOR is a contained hardware system. The build platform is original in design and functionality, an innovative blade design ensures smooth operation and increased build speeds that produce parts up to 30 percent faster.

In terms of safe operation in smaller facilities, the ORLAS CREATOR utilises a cartridge materials handling system. Filled cartridges can be supplied by O.R. LASER, but the company keenly recognises the need for an open material system, and operates accordingly. Moreover, parts produced on the ORLAS CREATOR offer resolution comparable with higher spec machines on the market.

O.R. LASER has also worked hard on developing the right operating ecosystem for the ORLAS CREATOR, with sophisticated software and interface developments. This means that no third party software is required to run the machine and eliminates additional costs of running. In fact, O.R. LASER intentionally minimises dependence on third parties across its operations. The company is not a machine integrator, but rather a machine producer with more than 80 percent of the hardware produced in-house as well.

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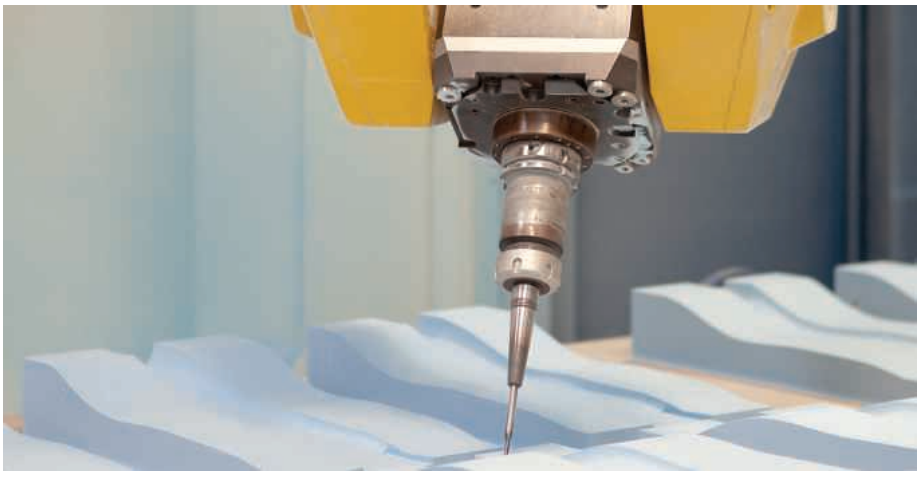
Formaplex tools up to support expansion programme

Leading UK manufacturer reduces machining times with Autodesk

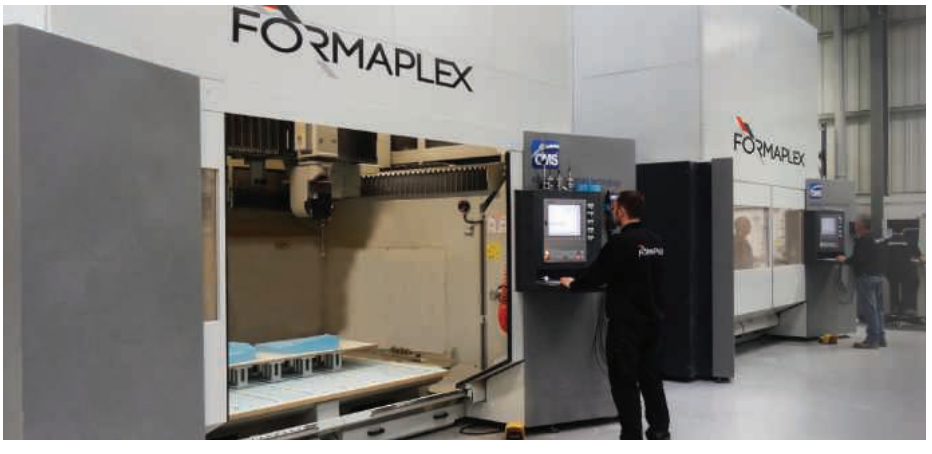


Steady growth and rising customer demand led to Hampshire-based Formaplex requiring quicker and more advanced manufacturing processes to meet time critical deadlines, maintain quality and improve efficiency.

Formaplex employs a skilled workforce of over 400 people and is a world renowned manufacturer of injection mould tooling, composite tooling, thermoplastic and composite components for automotive, F1, aerospace, defence and other leading industries. Founded in 2001, Formaplex started out as a machining company for F1 and has since experienced strong growth, evolving into a tier one supplier for global, blue chip customers. Over the years, Formaplex has extended its operations to include, 44 x 5-axis and 3-axis machines, with machining envelopes up to 8 m x 6.2 m x 2 m.

The demand for Formaplex's services has grown considerably, due to its reputation for producing high quality tooling and components within extremely short lead times. Production planning is often a live exercise with bespoke, complex and last minute requests regularly being added to the schedule. As a result, Rob Carter, group machining support manager at Formaplex and the team are used to planning work in real-time. For Formaplex to consistently deliver to its high standards, the most agile machinery, tooling and design processes were required to support increased production levels. Formaplex's engineers work with 5-axis and 3-axis machines, which require the best technology for cutting precision mould tools, advanced patterns and also for manufacturing processes. After approaching its previous CADCAM supplier, it found that the software required to support 5-axis-machinery would be a third-party add-on rather than a fully integrated package. Formaplex researched various technology partners and quickly realised that it could find the support and shared values with Autodesk to achieve all of its objectives.

"Some of our customers see us as an emergency service. The demands are extremely high to deliver on both speed and quality and we required more advanced and agile processes to support this. We have to 'play Tetris' in terms of organising jobs across different machines with the capacity hours available to us. We operate around the clock, 24/7 to ensure we meet tight delivery schedules. After investigating Autodesk's manufacturing portfolio we agreed that it offered everything we needed to advance our machining processes," comments Rob Carter.



Cutting down production time

Formaplex uses its 5-axis CNC machines to create complex shapes that were beyond the capabilities of its existing CAM solution. With Autodesk PowerMill, the machines can safely move around the material with ease, reducing machining times significantly.

The engineering team prides itself on achieving excellent levels of machine utilisation. PowerMill performs a key role here by enabling the calculation of high-quality toolpaths in super quick time, ensuring machines are kept running day and night. Increasing automation in this way has improved operational efficiency by speeding up processes and freeing up capacity.

PowerMill's automatic collision detection and avoidance functionality, also means operators can work safely and in confidence, even when machines are running overnight with offsite monitoring. Programs can be checked prior to cutting and the parts are cut at a faster rate with improved utilisation during the production process.

"Our customers trust us to deliver and by investing in PowerMill we've noticed greater

efficiency from our CNC machines. We can increase our capacity with confidence and are able to take full advantage of our investment in the new machinery. If we have something particularly complicated to create, the Autodesk team will offer support on request and assist with the programming. It's a great partnership and Autodesk helps us to progress and push the boundaries of what we can do," comments Rob Carter.

Since working with Autodesk, Formaplex has incorporated Autodesk PowerShape into the design process. Rob and his team review the data and design process for each component and tool to ensure compatability with their tooling capability for ease of manufacture.

PowerShape and PowerMill work hand in hand with each other and parts are created in a more efficient and fluent manner. Parts that are complex to machine can have elements modified and new surfaces and patches can be introduced to aid the machining process. The team at Formaplex are now able to design molds and patterns with PowerShape and then use PowerMill to perform the cutting, streamlining the entire manufacturing process.

"With such a large investment in 5-axis

machines, we needed the right advanced software to optimise and achieve the best ROI. Having PowerShape and PowerMill all under one roof provides a seamless CADCAM package," explains Rob Carter. "We're able to extend surfaces for the aid of machining and deliver faster results for our customers. If an engineer has to go back to the CAD designer to ask for changes, our production is slowed. PowerShape and PowerMill working together provides the agility and flexibility that we need for maximum efficiency."

Formaplex's commitment to precision, quality and customer satisfaction is paramount. The company recognise the value of introducing part measurements to the manufacturing process and by using Autodesk PowerInspect combined with portable inspection arms, engineers can check the machined parts for dimensional accuracy at any time during machining. This speeds up the process by ensuring that parts are fully machined to exacting standards before they are removed from production.

Planning for the future

Formaplex is continuing to expand its manufacturing facilities and now operates from four sites across the south coast, covering 270,000 sq ft. More than £6 million has also been invested in a state of the art facility aimed at increasing injection moulding capacity, with additional component assembly and finishing areas and a semi-automated paint line.

"The new 120,000 sq ft facility will help increase our capacity and support our future growth. We've invested in Autodesk as a part of this development to help us achieve higher manufacturing output for our customers. Advanced scheduling will always be a challenge, but with Autodesk and the right tools at our fingertips, we have the confidence to deliver," concludes Rob Carter.

Autodesk Ltd
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GibbsCAM 2016 certified for Autodesk Inventor 2017

Certification enables higher productivity and accuracy in CNC programming from CAD models and provides the highest level of interoperability with Autodesk Inventor 2017, R3

3D Systems has announced that its suite of GibbsCAM 2016 software for programming CNC machine tools has been certified by Autodesk for Autodesk Inventor 2017 mechanical CAD software. Among other benefits, this certification assures that engineers and CNC programmers can use GibbsCAM 2016 to program complex and simple parts for machining on all kinds of CNC lathes, mills, turning centers, machining centres and multi-tasking machines, directly from Inventor and Inventor CAD models.

GibbsCAM 2016 is certified for Inventor 3D mechanical design software under the Autodesk Certified Apps Program, marking the sixteenth consecutive year that GibbsCAM has been certified under the program. Certification demonstrates that GibbsCAM 2016 is of high quality and provides interoperability with Autodesk's latest release, Inventor 2017, R3.

Meeting the requirements of the Autodesk Certified Apps Program demonstrates a commitment to shared Inventor-GibbsCAM customers and ensures that these customers can achieve the highest productivity from Inventor resources with the latest features of GibbsCAM 2016. Integration with Inventor, combined with GibbsCAM's automation features, makes the preparation for machining much simpler and faster, providing huge time savings for Inventor users. GibbsCAM's short learning curve and unique, shop-friendly user interface provide additional productivity from ease of use, reliability, and speed of programming.

Interoperability with Autodesk Inventor

GibbsCAM seamlessly reads Inventor Part Model (IPT) and Inventor Assembly (IAM) files, preserving all CAD, color information, hole features and attributes assigned within Inventor, to provide continuity in recognising and communicating part and feature attributes. Alternatively, with the GibbsCAM Autodesk Inventor Add-in, Inventor users can transfer files directly into GibbsCAM on the same workstation with the "Transfer to GibbsCAM" menu option.

Once machining processes are defined in GibbsCAM, they are automatically updated when the Inventor model is revised. Users can additionally employ the GibbsCAM Plug-in for Autodesk Vault software to allow interaction between GibbsCAM and the Autodesk data management software. The combination of GibbsCAM 2016 and Inventor cover the range of design, manufacturing and product data management across multiple industries.

Whether parts have simple geometry requiring general machining, or complex geometry requiring multi-axis milling, multi-task machining, or Swiss-style turning, GibbsCAM 2016 easily accommodates the Inventor production environment.

3D Systems – GibbsCAM is an authorised member of the Autodesk Developer Network, and is an Autodesk Authorised Independent Software Vendor. GibbsCAM 2016 software is a Certified App for Inventor.

3D Systems provides comprehensive 3D products and services, including 3D printers, print materials, on-demand manufacturing services and digital design tools. Its ecosystem supports advanced applications from the product design shop to the factory floor to the operating room. 3D Systems' precision healthcare capabilities include simulation, Virtual Surgical Planning, and printing of medical and dental devices as well as patient-specific surgical instruments. As the originator of 3D printing and a shaper of future 3D solutions, 3D Systems has spent its 30 year history enabling professionals and companies to optimise their designs, transform their workflows, bring innovative products to market and drive new business models.

Autodesk Inventor 2017 Certified App - GibbsCAM 2016 seamlessly reads Autodesk Inventor 2017 IPT and IAM files, preserving assigned CAD and hole features, so the GibbsCAM user can use the data for CNC programming and machining parts on all types of turning, milling and multi-tasking machines

UK Distributor:
Tech CADCAM Ltd
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www.techcadcam.net

Mastercam 2018 available for global public testing

Mastercam 2018 PUBLIC BETA

Mastercam 2018 Public Beta is now open to all currently maintained Mastercam customers. Users all over the world, from small job shops to Fortune 100, get a chance to test-drive Mastercam 2018 before it is released and provide valuable feedback to help shape the final product. Participants in the Public Beta get an early look at dozens of powerful new tools for simple to complex jobs.

Here are a few things you'll see in Mastercam 2018 Beta:

New 2D/3D milling features improve toolpath efficiency and control with variable stock to leave, feed rate control, undercut support, and stock awareness enhancements.

Design Improvements simplify CAD for CAM and deliver greater practical design tools for shop-floor programmers. Mastercam 2018 provides improved model creation tools, streamlined editing of models and assemblies, expanded Undo support, and more.

Expanded Multiaxis makes it even easier to program complex parts, and improves workflow and usability while adding new projection strategies, improved tool axis control, and safety zone features.

Lathe focuses on efficiency with new toolpath and chip control features, as well as adding tool inspection and part transfer stock model enhancements.

Mill-Turn inherits all improvements to Mastercam Lathe, in addition to improved center and tailstock support, greater flexibility, and automation for part transfers.

Machine Cloud and CoroPlus support improves tool management, creation, and use of tool assemblies and parameters.

Other features include streamlined workflow with improved plane management selection, toolpath analysis, graphic enhancements and much more and many other productivity improvements.

For more information on Mastercam's Beta release, contact:

UK Distributor:
4D Engineering Ltd
Tel: 01285 650111
Email: sales@mastercam.co.uk
www.mastercam.co.uk

Vero optimises Georges Pernoud's IT System for Industry 4.0

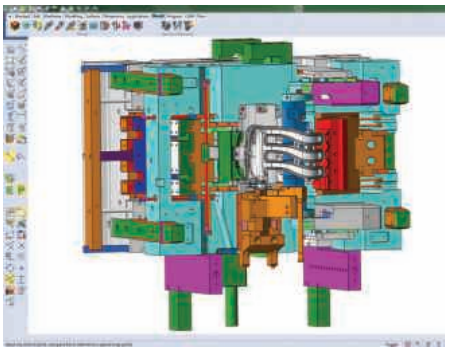
Preparing for Industry 4.0 was so important to an injection mould manufacturer that it tasked CADCAM provider Vero Software with optimising its IT system to cut the time taken on non-value-added CAD tasks by 35 percent.

Based at Oyonnax in France, George Pernoud is a family-run business with around 100 employees, producing moulds for the automotive, domestic appliance and construction industries. CEO Gilles Pernoud says that Vero's involvement has meant the approach to digitising their design and manufacturing aspects ensured end-to-end digital processing and represents a global company project rather than just an IT scheme.

The company has worked with Vero products for 17 years. "We rely on innovation and productivity, and started digitising our systems in 2000. At that time we were looking for a 25 percent reduction in the price of our tooling equipment to remain competitive," adds Gilles Pernoud.

The most recent digital investment involved replacing the CAD system to cut time taken on tasks such as data recording, file transfer and translating, alongside the creation of technical documentation.

"This led to Vero Software optimising I.T. and integrating the VISI CAD solution for 3D tool design. We reorganised our processes to digitise each phase, and, above all, link them by eliminating any discontinuity in the digital workflow. This enabled us to remain competitive, and sustain design and technical engineering in France, while



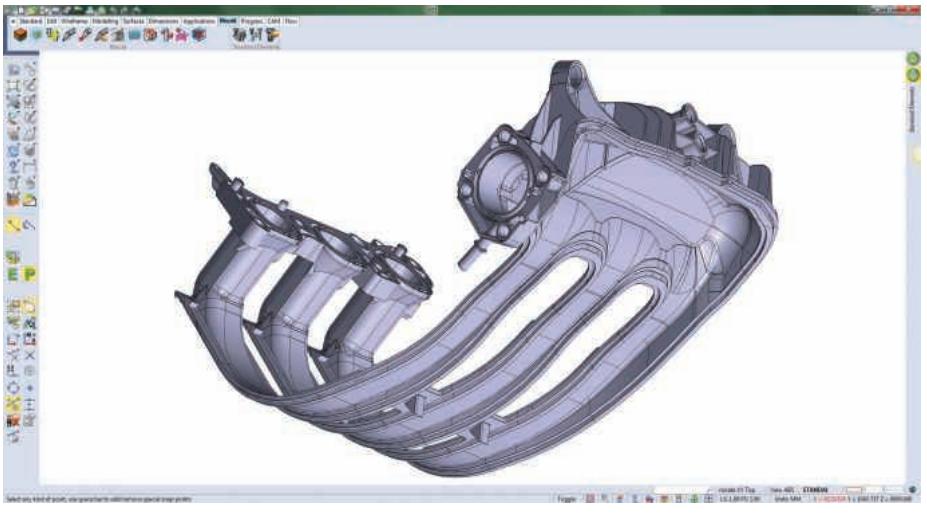
continuing to sell our moulds at the same time."

The VISI product suite is just one of four Vero Software packages currently in use by the company, as Gilles Pernoud explains: "After receiving data from our clients we use WorkXplore to analyse the geometry and rapidly supply a tooling feasibility report to the prime contractor. Then we move on to the actual project phase, using the VISI applications to design the tool and manage associated documentation."

Using the WorkPLAN CAPE module allows Pernoud to link data both from the workshop and the CAD platform.

"Once the design is complete, we recover all relevant CAD data, whether this has been generated internally, from our engineering office in India, or from the subcontractors." He says that they then have other procedures in place for recovering files originating in other CAD systems.

"Finally, we generate CNC programs for our machines with WorkNC using a native data transfer from VISI."



The whole process means data can be accessed from any of the company's sites.

"This includes Slovakia, where we have 25 staff providing after-sales service for moulds sold in Eastern Europe. They can access all project data from our headquarters in France and the same process applies to our subsidiary in the United States."

Gilles Pernoud says that not only did Vero help implement the system, it also provided security access and database duplication, ensuring operational continuity in the case of network failures.

"After using this system for two years, we achieved a 35 percent reduction in time spent on non-productive CAD tasks. We believe we can do even better by integrating the metrology branch, following Vero's acquisition by the Hexagon Group."

Finally, he says incorporating VISI into the IT system has enhanced the company's reputation as it enables their prime contractors to access up-to-date technical elements of projects on their FTP site.

Vero Software's sales manager for France, Antonio Parisse, says: "We have established a fully collaborative relationship with the Pernoud company. We consolidated everything for efficient communication between the engineering department and the workshop, and later with production control allowing us to adapt each of the different software solutions to meet their specific requirements and ensure full interoperability."

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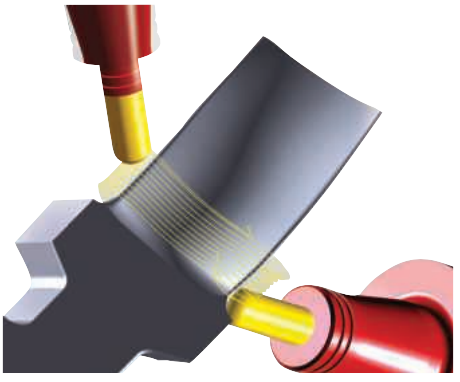
Total Turbomachinery solution with hyperMILL

SoftInWay Inc. and OPEN MIND Technologies AG has announced a cooperation agreement to provide a complete solution for the design, development and manufacturing of gas turbine components and other types of turbomachinery. Both companies are known for their best-in-class software platforms that provide component developers the needed productivity tools to accelerate the product development and production process while maintaining a high level of accuracy.

The AxSTREAM® Software Platform provides an integrated and streamlined approach to turbomachinery design. The software consists of a number of different modules to perform preliminary design, meanline and streamline analysis, CFD and FEA, blade profiling, and rotor dynamics, bearings analysis, and rotor design for compressors, pumps and turbines. These tools are used to produce optimal components, considering speed, power, range, and life. The interactive and user-friendly design process enables these conditions to be achieved efficiently and reliably.

hyperMILL® is a modular complete CAM solution for 2.5D, 3D, 5-axis, HSC/HPC, and mill-turning processes, as well as its special applications and highly efficient automation solutions. The CAM software provides technology-leading geometry analysis and tool path calculations. There are specialised routines designed for efficient programming and machining of these components on 5-axis milling or mill-turn machines. The multi-blade and single-blade turbomachinery solutions are embedded within hyperMILL that is applied to more broad-based milling, drilling and turning applications, allowing an all-in-one CAM system for turbomachinery developers. Robust CNC postprocessors are also provided to assure strong communication to machine tool controllers.

This partnership between SoftInWay and OPEN MIND brings product, services, sales and technical teams together for a complete software solution. Customers can work with each company to obtain tools, training and



services from these industry experts. Both companies are well represented with direct employees and authorised resellers in America, Europe and Asia and look forward to collaborating together to contribute towards the advancement of the turbomachinery industry.

OPEN MIND Technologies
Tel: 01869 290003
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www.openmind-tech.com

New features extend performance of exocam powered by ModuleWorks

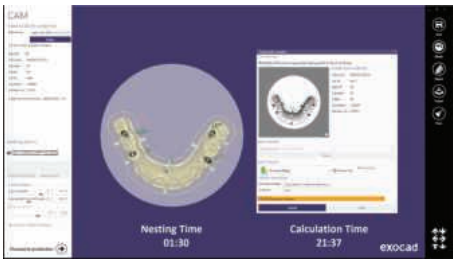
ModuleWorks, a leading supplier of CADCAM software components for machining and simulation, has announced a major new update for "exocam powered by ModuleWorks".

"exocam powered by ModuleWorks" combines the exocad nesting module with an advanced dental CAM-engine that performs toolpath calculations and outputs the corresponding NC file. The seamless integration of exocam into exocad, its easy-to-use workflow, and the powerful and configurable integrated dental CAM-engine from ModuleWorks optimise efficiency, quality and productivity in dental labs and milling centres.

The latest update contains new features and enhancements that further boost the performance, quality and application range of the software:

• Configurable add-on CAM packages (machining templates, post processor) for all Roland and imes-icore CNC machines

• Configurable pre-mill abutment libraries within exocad-exocam or directly in exocam Support for angulated screw-channel



abutments and hybrid screw-channel abutment-bridges

• Support for denture and denture-teeth preform libraries

• New stabiliser libraries and new stabiliser shapes

• Enhanced machine-dependent configuration, including a dedicated blank library for each machine, single-/multi-slot holders for each blank and support for multiple machines, each with their own CNC-strategy

• Enhanced multi-layer visualisation for blanks

• OEM configurable user interface and "Help for CAM" button in the action bar

ModuleWorks is a software component provider for the CADCAM industry. ModuleWorks' expertise in toolpath creation and simulation is recognsed throughout the CAM industry and its software components and development services are used by the majority of the leading CAM vendors for industry focused solutions across diverse business sectors. ModuleWorks Dental Framework brings these benefits to the dental CAM industry. Already used by many leading Dental systems, the advanced 3-axis, 4-axis, 5-axis and Simulation technology provides rapid toolpath calculation times, fast machining times and high quality results.

Further information on the ModuleWorks Dental CAM toolpath generation technology is available from:

ModuleWorks GmbH
Tel: 0049 241 9900040
Email: info@moduleworks.com
www.moduleworks.com

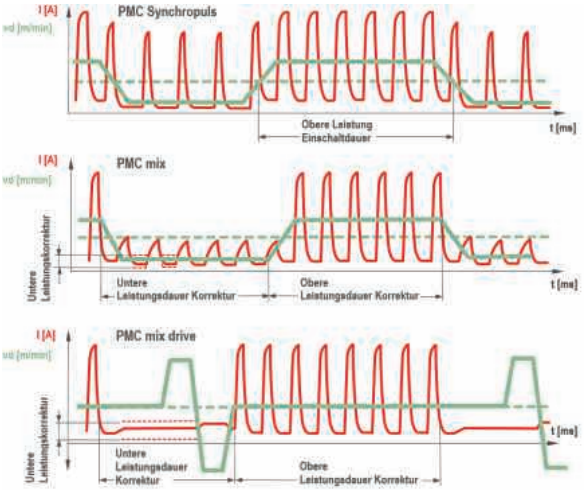
Some don't like it so hot

New combinations of processes allow for the precise control of heat input when welding

The most exact control over the heat input as possible, especially when welding vertical-up seams or joining different thicknesses of sheet metal, such as with pipe-to-flange joints, is essential. PMC mix drive, the new welding process variant, now allows the most precise heat input setting of any process to date in which high and low energy phases are alternated at a low frequency (e.g. SynchroPulse).

Welding vertical-up seams using a standard MIG/MAG power source requires a lot of skill on the part of the welder. In order to prevent the weld seam from sagging, the welding torch needs to be guided in an open triangle (also referred to as a fir tree) so that the weld pool is cooled down by this weaving motion. Innovative power source manufacturers have therefore used the increasing performance capabilities of digital power sources to develop functions that no longer require this weaving motion, thus simplifying the welding of vertical-up seams or joining of sheets of different thicknesses.

Several years ago Fronius was already using this technology to develop its SynchroPulse function, whose activation involves the welding power jumping back and forth between two operating points of the selected characteristic. Achieved by increasing and decreasing the wire speed, the user can set the scope of this fluctuation between 0 and 2 m/min and the frequency between 0.5 and 5 Hz. While the root pass is reliably formed during the high current phase, the process stabilised in the low current phase and the base material cools down. This discontinuous heat input has recently proven to be particularly cost-effective and capable of achieving the weave pattern typical of TIG welding, but without any of the time-consuming weaving motions. The impact is especially pronounced with the robot-assisted welding of aluminium.

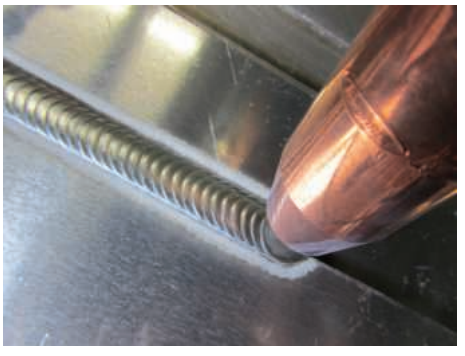


With the new PMC mix and PMC mix drive process variants, the heat input during welding can be controlled even more effectively than with the solutions that have been available to date

A realistic test setup has clearly shown that PMC mix drive can be used to weld up at speeds of up to 30 cm per minute in aluminium and is therefore considerably more cost-effective than ever before

With the launch of the latest MIG/MAG power source, the TPS/i, Fronius has once again expanded significantly on this function and introduced additional parameters. Among the benefits of this has been a dramatic increase in the stroke (the gap between the high and low current phases). Furthermore, the length of the high current phase within a cycle can be set as a percentage using the Parameter Duty Cycle, and is no longer restricted to a ratio of 50:50. This allows the heat input to be regulated more accurately over a larger range and independently of the wire speed. Due to these developments, welding vertical-up seams with the SynchroPulse system has become even easier.

Fronius has now gone a step further and used the extensive resources, such as the large memory, high computing power and the internal high performance communication bus (SpeedNet), to create even more significant innovative approaches to controlling the heat input.



An optimally weaved and spatter-free weld seam produced in aluminium using PMC mix drive is visually indistinguishable from a TIG seam

The best of both worlds: PMC mix

Fronius has developed a completely new algorithm for the PMC mix, whereby the welding process does not just simply jump back and forth between two operating points of a characteristic, as with SynchroPulse, but switches between an impulse (PMC) and a dip transfer arc process (LSC).

LSC (Low Spatter Control) is renowned for its very steady arc and minimal tendency to produce spatter. Within the new PMC mix approach, the LSC ensures that the weld

pool is stabilised and supported (i.e. it is the "cold" process phase). PMC (Pulse Multi Control) is the most advanced pulsed arc available from Fronius. It guarantees a high welding speed with optimal droplet detachment during pulse welding and is responsible for the necessary penetration.

This allows PMC mix to encompass an even larger power range than SynchroPulse and enables higher welding speeds than a pulsed arc process in combination with SynchroPulse or a TIG process can achieve. PMC mix is thus the ideal solution for automated welding applications too.

Alongside the familiar arc length and pulse/dynamic correction functions, Fronius has also developed new correction functions for PMC mix that enable precise control over the heat input. Using "upper power time correction", the user can set the duration of the hot process phase in a mixed process. Likewise, the duration of the cold process phase in a mixed process can be set using "lower power time correction". "Lower power correction" allows the energy input of the cold process phase to be varied in a mixed process, such that even a small power correction leads to a noticeable change in the input. This allows for even more precise control of the heat input than has been possible in other methods available to date.

PMC mix drive

Fronius has once again expanded its range with the PMC mix drive. This process offers more precise control over the heat input in comparison to SynchroPulse and PMC mix. It is characterised by a low power phase, which is generated with the help of a push-pull welding torch: the welding torch's drive unit performs a reversing wire electrode movement during the cold process phase. Reversing means that the wire electrode is moved backwards after every short circuit. The powerful process control "recognises" the short circuit point and aids droplet detachment by pulling back the wire. The practically currentless material transfer that follows, as well as the broken arc, delivers a stronger supporting function during the cold process phase.

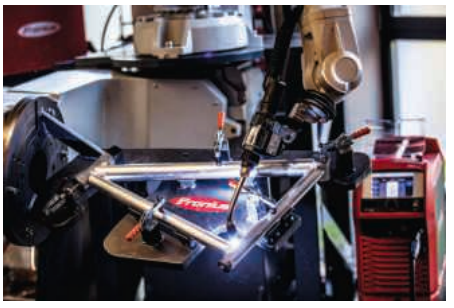
Additionally, the arc length is precisely and extremely quickly corrected via mechanical means in every cycle, thanks to the TPS/i's powerful control loops, meaning that the PMC mix drive is especially reliable and low-spatter. The same correction functions as for the PMC mix are also available.

PMC mix drive harnesses the possibilities offered by a powerful PullMig welding torch, such as the Robacta Drive, to control the heat input even more precisely when welding aluminium, CrNi or vertical-up seams in steel

PMC mix drive or PMC mix – a system comparison

Whether the PMC mix drive or the PMC mix is the better choice depends on the application and the existing or intended device configuration. Thus, PMC mix lends itself to welding applications where steel is to be joined by hand or semi-automatically. In general, push wirefeeder systems and manual welding torches without integrated wirefeeder motors are used here. However, if aluminium materials are to be welded using the MIG process, PMC mix drive is recommended, as push-only wirefeeder systems are unable to deliver the required level of performance here.

Even with a welding system like the TPS/i platform, which boasts an especially precise wirefeed function (i.e. innovative feed rollers and contact tips, optimised plastic hosepack liners, powerful drive motors), the aluminium wire electrodes, which are much softer than their steel alternatives (especially when it comes to pure aluminium or Al-Si alloys), can become clenched in the hosepacks, making it very difficult for them to be fed properly by push-only systems. As a result, push-only systems tend only to be suitable for manually welding aluminium with hosepacks of just a few metres in length. With mechanised or automated



Cheaper alternatives to TIG welding for the joining of aluminium are currently in high demand. For this reason, Fronius has developed the new process variants PMC mix and PMC mix drive

welding, the maximum length is significantly shorter.

In the interest of problem-free operation, however, the use of pull or combination (push-pull) wirefeeder systems is recommended with these hosepack lengths. When there is a larger distance between the welding torch and the wirespool or drum, they are a must. For mechanised or automated welding of softer (aluminium) or thinner (CrNi) wire electrodes in particular, it is recommended to use the PMC mix drive in combination with a pull welding torch such as the Robacta Drive. This allows aluminium to be welded considerably more quickly and, above all, more economically in comparison to TIG welding. It also has a positive effect on the cost balance: the welding torch with direct drive that was specially designed for robot applications is generally able to feed the wire directly from the drum without the need for additional drive units.

In general, wire can be fed for distances of up to 6 m without the need for special measures. If all the components of the wirefeeder system are used optimally and tailored to each other, e.g. with the aid of PowerLiner equipment, this distance can even be increased to 8 m.

Vertical-up welds, joining sheets of different thicknesses, lap joints and TIG-esque weld rippling can be realised more quickly and cost effectively than ever before thanks to the PMC mix and PMC mix drive.

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A bright future for lasers in sheet metal welding

Welding thin sheet metal using traditional processes can often be challenging. Good penetration is essential to fuse the individual components together. However, it can be all too easy to burn right through the material because it heats up very quickly as you weld. Another drawback is that in many cases the components may need to be tacked together to stop them moving during welding.

Lasers however, offer the optimum welding solution for sheet metal welding due to their high welding speed, narrow welding seams and low thermal distortion. These attributes have led to a rise in the uptake of the ALPHA LASER range offered by Bromsgrove based TLM Laser.

With laser welding, the rapid fusing of the material in the laser pulse process combined with very low heat input make this the ideal process for almost distortion-free joining of thin sheet metal. The precise control of the energy input to suit the material and the ability to shape the pulses also prevent the formation of cracks. Even components produced from differing material types and / or thicknesses can be welded easily.

Other distinct advantages include the high density of the finished weld seams and the fact that the laser welding process almost completely eliminates the time consuming and costly finishing processes associated with traditional welding techniques. Laser welded seams also meet all of the requirements for food industry or clean room applications.

The advantages of laser welding, which include high quality seams, dimensional stability, low thermal effect on materials and high levels of repeatability, mean that the process is ideally suited to both the production development and volume manufacturing phases of a project. In addition, the power, precision and flexibility of lasers have initiated many new concepts in component design.

Andy Toms, director at TLM Laser comments on the growing uptake of lasers for sheet metal applications: "The spectrum of applications where lasers are now being successfully applied is vast. Miniature components with a material thickness of just 0.1 mm can be processed equally as well as complete assemblies measuring 1 m or more. In addition, experience shows that laser welding can deliver a cost reduction of up to 30 percent when compared to the traditional arc welding process. Add to this a product line that includes both stationary and mobile laser welding systems covering traditional lamp-pumped lasers with power up to 500 W, as well as the latest fibre laser technology that puts out up to 900 W, it is clear to see why lasers are growing in popularity within sheet metal applications."

TLM Laser has seen a significant uptake in the use of lasers for sheet metal welding.

All of the ALPHA LASER systems distributed by TLM Laser in the UK and Ireland are easy to operate and do not require costly setup or programming to get started. Repetitive welding tasks in volume production require no additional CNC knowledge and take just seconds to teach into the system.

One example is the mobile, flexible and programmable ALFlak laser welding system. With its unique arrangement of traversing axes, this mobile system makes it possible to process very large sheet metal parts in situ, or weld small components on a separate workbench. Weld seams up to 500 mm in length are easily achievable without having to re-position the workpiece.

Circular seams are achieved using a rotating axis. The process is monitored through a stereo microscope and for volume production this can be enhanced with the incorporation of a camera. ALPHA LASER systems have been also developed with ergonomics in mind, to minimise fatigue for the operator.

The growing range of applications where TLM has seen the introduction of lasers for sheet metal production include the manufacture of components for a widely recognised German automotive manufacturer and the repair of safety critical parts for large vehicles, where laser welding was selected following lengthy evaluation of other processes.

Those considering the use of lasers for sheet metal welding can explore the benefits specific to their application by contacting:

TLM Laser
Tel: 0845 2602220
Email: sales@tlm-laser.com
www.tlm-laser.com

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TPS/i IS THE CORONATION OF WELDING. BECAUSE WE INTEGRATED CMT.

TPS/i was the intelligent revolution in welding technology and has set new standards in terms of improvement, individuality and interaction. By integrating our legendary Cold Metal Transfer welding process, we are now taking a huge leap forwards. The TPS/i combined with the CMT welding process is a highly flexible welding system. It enables multi-platform production operations to be performed with the best welding processes for every application.

TPS/i with CMT not only ensures your production plant is equipped with the cutting edge technology of today, but of tomorrow too. Want to know more? Call us on 01908 512300

Interested?

www.tps-i.com

More about the Open House event: www.froniusevents.co.uk

New Rebel welder provides the most power and portability in a single-phase machine

ESAB introduced its new series of Rebel™ welders at the recent EuroBLECH 2016 exhibition in Hanover. The Rebel EMP 215ic MIG/TIG/Stick welder offers primary power and location flexibility and some of the most innovative welding technology available today.

The Rebel EMP 215ic is a 120V - 230V, CC/CV welding system that offers true multi-process arc performance, location flexibility, lightweight portability and a groundbreaking operator interface with LCD/TFT display.

The Rebel provides ESAB's unique sMIG ("smart MIG") function, which enables users to begin MIG welding with an extremely stable arc, simply by setting metal thickness and wire diameter. Unlike competitive units, there is no need to enter information for shielding gas mix. Both units can weld dual shielded flux cored wire up to 1.2 mm, perfect for small fabrication shops, construction sites and shipyards, particularly where it makes sense to run short welds with a portable machine and finish the length of the weld with a stationary unit.

Operators interact with the Rebel EMP 215ic using a unique control that combines traditional weld parameter adjustments with the functionality of a smart phone (in fact, the 110 mm colour display uses the same thin-film transistor (TFT) LCD technology found in smart phones). No other welder combines this level of simplicity, performance and control. The TFT user interface offers 21 languages, covering all of Europe, offering important information beyond weld parameters, such as part numbers for easy reordering.

For easy replacement of the torch, both machines contain EASB's Euro connector, allowing operators to quickly step up to a heavier-duty torch for additional feedability and current transfer, such as for aluminum or flux cored welding. Both units come standard with an MXL 200 torch.

The Rebel EMP 215ic provides an industrial quality arc for MIG, flux-cored, Lift TIG and MMA welding, including excellent performance with MMA electrodes up to 4 mm.

When connected to 230V primary, the unit provides a MIG output of 20 to 220 amps, a Stick output of 30 to 160 amps and a TIG output of 5 to 240 amps. When connected to 120V primary, the unit provides a MIG output of 15 to 130 amps, a Stick output of 5 to 110 amps and a TIG output of 5 to 140 amps.

The unit comes ready-to-weld for all welding processes and includes a professional-grade MIG gun, a stick electrode holder, drive rolls, contact tips, all required hoses and cables and a spool of ESAB´s innovative, non-copper-coated wire AristoRod 12.50.

New Renegade es 300i MMA/Livetig Welder offers more power in a portable package

ESAB also unveiled its new Renegade ES 300i MMA (SMAW)/LiveTIG (GTAW) welder at EuroBLECH 2016. The inverter-based MMA/TIG machine offers extreme power in a compact format: it weighs 15 kg, measures 460 x 200 x 320 mm and produces a top output of 300 amps at 40 percent duty cycle. Easy-to-grab front, rear and top handles give the operator maximum flexibility for lifting the machine.

For added location flexibility, automatic voltage detection enables the machine to accept three-phase primary power input ranging from 230V to 480V ±10 percent.

The Renegade's unique handle design offer built-in storage and security for the welding cables so operators can quickly pack up and go by wrapping the cables around the handles and locking them in with a dedicated shoulder strap. Renegade's rugged composite casing was designed to withstand the roughest environments and more mechanical impact than any other machine on the market.

The Renegade has an amperage output range of 5 to 300 amps, including LiveTIG for TIG welding where HF ignition can't be used. The Renegade can weld with electrodes up to 6 mm has gouging capabilities with carbons up to 4.8 mm diameter, making it the most powerful welder in its weight class. Performance features include Adjustable Hot Start, a process that provides optimal energy during the starting sequence, improved strike performance and reduced sticking. Similarly, the Adjustable Arc Force function enables the operator to adjust the arc characteristics to find the right balance between arc control, penetration and weld bead appearance. Preferences can be stored in one of three memory functions.

ESAB Tel: 0800 3893152
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World standard Weld Purge Monitor

Weld purging is the act of removing, from the vicinity of the joint, oxygen, water vapour and any other gases or vapours that might be harmful to a welding joint. Such gases may combine with the metal to form undesirable compounds that may reduce corrosion resistance or may be instrumental in creating cracks or other structural defects in metals.

To ensure non-oxidised, zero colour welds are achieved when welding metals such as stainless, duplex and chrome steels, titanium and nickel alloys, a Weld Purge Monitor® (oxygen monitor) must be used to measure the oxygen level before and during welding.

The World Standard PurgEye® 100 IP65, designed and manufactured by Weld Purging Experts Huntingdon Fusion Techniques HFT is available at a low cost, avoiding the requirements to fill entire tubes and pipes with expensive inert gas and avoiding the need to guess when the oxygen level is low enough to begin welding.

A customer in the UK recently said: "When working with medium to large diameter exotic pipework, using the PurgEye 100 can prevent you from having a very bad day. Previously, I only ever used the older model and the introduction of the PurgEye 100 was a godsend. Anyone, from the welder who has had to carry out weld repairs due to root weld oxidisation or coking on such materials, to the directors facing an expensive bill for re-work and possible tarnished company reputation, or the client with their project now running behind schedule, will know exactly what I mean. Weld Purge Monitors are a necessity."

The PurgEye 100 is IP65 rated and comes with leak-tight push buttons, auto calibration features, vacuum-sealed leak-tight probe assembly, wrist/neck strap and tripod mount. The extra-long life sensor provides approximately 18 months life before it requires changing. A low sensor indicator will appear on the screen, warning that a new sensor is required. Once that icon appears, it provides the user with adequate time to obtain a new sensor, which can be fitted like changing a battery, while the monitor can be re-calibrated easily by the user.

The PurgEye 100 has a clear, easy-to-read LCD screen with a 24 mm high display. The display also shows a low battery icon. When the monitor is not in use, an automatic sleep mode activates to conserve battery life.

A PurgEye 100 video can be viewed at: **https://youtu.be/quw_xtSZDAw**

Huntingdon Fusion Techniques
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Process diversity perfection

At the EuroBLECH 2016 exhibition, CLOOS presented the new Root Penetration Control (RPC) welding process for the first time. The controlled short arc process is particularly suitable for the special requirements of pipe constructions, for root welding or thin plate welding. The RPC process is characterised by a stable, low-spatter arc which is resistant to external influences by the welder. Due to the low heat input, the energy requirement and the component distortion reduce considerably. This brings the costs for possible reworking down to a minimum.

CLOOS also presented the new functions of the tandem weld process for automated welding. Since 1996, CLOOS has been a global market leader in tandem welding and has continuously developed this process. A total of several thousand tandem weld applications by CLOOS are in use. New synergy characteristic curves allow higher deposition rates and thus higher welding speeds. Besides, the new robot functions facilitate programming. The robot uses the wire orientation vector function to recognise the position of the welding torch and the welding direction automatically which also reduces the programming expenditure.

High-quality power sources for versatile applications

During live-demonstrations of manual welding trade visitors experienced the wide model range of the CLOOS welding power sources from entry to premium. Visitors discovered the new TIG GLW 502 welding machine and also the new QinTron pulse for MIG/MAG welding with a pulsed arc. The QINEO Pulse for manual and automated welding was also highlighted. The main advantages of the powerful multi-process system are particularly versatile application possibilities and perfect welding characteristics. The QINEO Pulse is available in three capacity classes and combines five different welding processes in one machine. The QINEO Champ high-tech welding power source meets the highest demands and complex requirements in automation.

Individual automation solutions in all industries

With the QINEO welding machines, QIROX robots, positioners and special purpose machines CLOOS develops and manufactures customer-specific automated welding systems so users are able to meet the growing requirements of the automated welding technology. The portfolio comprises simple, compact systems as well as complex, chained systems with automated workpiece identification and loading and unloading processes.

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Kemppi innovation

Welding is becoming more and more challenging as new materials have greater strength, higher corrosion resistance and other performance-enhancing properties. Leading welding solutions provider Kemppi unveiled a number of new innovative products at EuroBLECH 2016.

Kemppi's new GAMMA GTH3 respirators for welders offer premium levels of protection and comfort for welding and related tasks. Even in demanding, low light conditions, the GAMMA GTH3 delivers the solution, lighting the way while safely shielding the wearer from harmful airborne contaminants. All GAMMA GTH3 models offer the highest TH3 level of respiratory protection and integrate new Comflex system technology.

The GTH3 improves the wearer's everyday work conditions and enhances productivity and personal safety. Innovative and practical work-based solutions include integrated LED BriteSafe work lights, LiFE+ color ADF welding lenses, fast-charge SD and HD Li-Ion batteries, Hypolite face seal fabric, and ClickLenz visor protection Connecting the X8 MIG Welder to the WeldEye cloud service gives access to Kemppi's unique management tools for both the welding work and documentation.

Digital WPS is a smart feature of the system which ensures that the welder always has the relevant and latest version of WPS at hand by providing detailed WPS information on the Control Pad's display. This revolutionises WPS management in welding production from both the welder's and the welding coordinator's point of view.

The Minarc Cordless 150 C portable and cordless welding machine has been designed for the most demanding welding tasks to bring freedom and the joy of working to maintenance welding. The

Minarc Cordless 150 C is a battery-powered, cordless welding machine that neatly packs your welding power to a convenient, portable solution.

Ready-to-weld anywhere anytime, the Minarc Cordless 150 C MMA cell pack frees site welders from the restrictions and safety issues of main power voltage cables and engine-powered generators. Weighing less than 10 kilograms, you can carry everything you need to the work site in one easy trip. But if you need to get to workshop-based welding tasks, just clip the Minarc Cordless 150 C into the Fueldock charging station and weld in the HYBRID mode – simply magic. Adding this new solution in your welding kit makes the freedom and safety of welding 'off-grid' possible.

For welding management, Kemppi has recently introduced WeldEye, a unique, cloud-based welding management software. WeldEye enables the use of digital WPS, eliminates welding with incorrect parameters, provides full transparency into welding production and reduces the time spent on welding documentation dramatically. This increases the overall quality of welding and streamlines production management.

WeldEye is a universal solution to manage welding production. It dramatically decreases the time spent on documentation and gives everyone involved in welding processes unprecedented insight into the work being done. The cloud-based software gives real-time insight into the performance of welders and the progress of projects as well as 100 percent traceable compliance with welding procedures, regardless of which brand's welding equipment is being used.

The WeldEye software has the widest coverage of different welding-related processes in the market, regardless of industry. It has proven its performance in shipbuilding, oil and gas, automotive, construction, and machine manufacturing.

Finally, for automated welding, Kemppi's state-of-the-art solution, the A7 MIG Welder 450, is a complete, perfectly balanced process package which can be integrated with any robot brand. It is suitable for use in any industry that uses robotic welding for thin and thick mild steel, stainless steel and aluminium.

Kemppi Wise software provides added value with many productivity benefits, and adapts A7 MIG Welder 450 for a variety of welding tasks. In addition, the system's enhanced arc ignition functionality, Touch Sense Ignition, stabilises the arc immediately after ignition and minimises the risk of spatters.

For improved usability, A7 MIG Welder 450 features a modern browser-based user interface that allows easy access to the power source from a standard computer via ethernet. This enables significant time savings in setup time and provides quality control benefits.

The A7 MIG Welder 450 consists of a welding gun, wire feeder, power source (available also as 350 A model), and cooling unit. The system is connected to the robot controller via easy-to-install fieldbus hardware modules.

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Email sales.uk@kemppi.com
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Weld monitoring devices support quality system requirements

Amada Miyachi Europe has introduced powerful high performance weld monitoring equipment ideal for process development, production monitoring, data collection and analysis to support quality system requirements. Amada Miyachi Europe weld monitoring devices can be smoothly integrated into the production process, providing precision real-time dynamic measurement of all welding variables. Available options include the MG3 Digital Weld Monitor and the Advanced Data Analysis Monitoring (ADAM) system.

With increased emphasis on accountability, the MG3 Digital Weld Monitor offers the tools required for process development, production monitoring, data collection, and analysis to support ISO, GMP and TQM requirements. The high-performance MG3 Digital Weld Monitor offers all the tools required for micro resistance welding applications, including process development, production monitoring, data collection, and analysis to support ISO, GMP and TQM requirements. Featuring two independent measurement channels, the MG3 Digital Weld Monitor offers oscilloscope functions with zoom and cursor modes, full on-screen SPC capability, and an integrated clock and date for weld reporting and traceability.

Representing the very latest technology in resistance weld monitoring, Amada Miyachi's Advanced Data Analysis Monitoring (ADAM) allows the operator to measure current, voltage, force, displacement, and cover gas flow/auxiliary input. It features a modern PC infrastructure to conveniently import and export saved data. Equipped with a large 22-inch colour widescreen monitor, ADAM allows users to view several charts conveniently. Users know what happens during the weld, as well as what happens before the weld is triggered. Sophisticated statistical process control (SPC) capabilities, including an integrated database and Minitab 15® statistical software, enable customers to analyse and collect data.

Other key features include high resolution sensors; pre-and post-trigger viewing; envelope limits; and Ethernet communi-

cations capability. ADAM also supports ISO, GMP and TQM requirements.

Amada Miyachi Europe is a leading manufacturer of equipment and systems for laser welding, laser marking, laser cutting, resistance welding, hermetic sealing and hot bar reflow soldering and bonding. Products are customised around specific micro-joining applications for customers around the globe.

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www.amadamiyachi.eu

TransLux Rigid Screen material for mobile protection screens

The TransLux Rigid screens from SINOtec are mainly used for machinery, eye and welding protection, as well as a dividing screen to separate the different production areas. In addition to high impact protection the polycarbonate material also protects the machine operator against impacts from flying particles and splashes from harmful radiation, coolants, lubricants, petrol and oils.

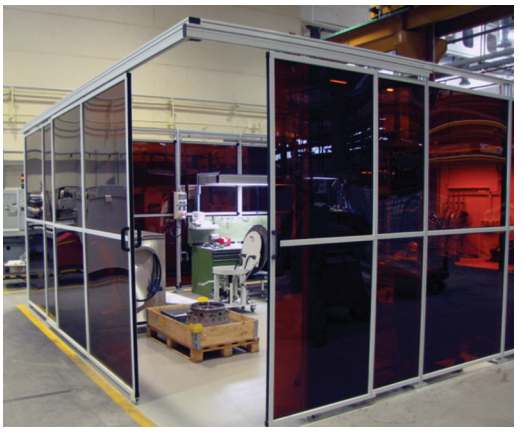
A combination of mobile partitions: TransLux sheets in dark green (T90) fixed into a mobile aluminium frame, together with a mobile OPTAC noise protection partition

TransLux Rigid Screens offer: very high resistance to impact; high robustness (elongation at tear > 80 percent); resistance against oil, petrol and grease; are non-electrically conductive; can be formed and bent without heating; have a constant operable low temperature range down to -40°C; have a constant operable high temperature range up to 115°C.

TransLux rigid screens are available in the following colours: T90 (dark green), T75 (dark green), T55 (euro green), T50 (red brown) and T40 (red orange). They are certified according to DIN EN ISO 25980:2015-01 und DIN EN 1598:2011-12.

Mobile TransLux screens can also be fixed into an aluminium frame. This screen can easily be placed to areas where protection against hazardous ray during welding, grinding and splashes is necessary.

Special features include: anodised aluminium frame; mobile frame, depth 720 mm, with four castors, two of them with



A robot partition: a combination of TransLux protective plate in T50 (red brown) and aluminium frame

brakes; floor clearance approx. 125 mm; standard width 1,310 mm/2,580 mm; standard height 1,865 mm/2,305 mm/ 2,705 mm; special dimensions on demand.

SINOtec Sicherheitssysteme GmbH
Tel: 0049 6074 85220
Email: info@sinotec.de
www.sinotec.de

HBE Dynamic Series on route for success

The new HBE Dynamic series from Behringer has been a resounding success since its launch in 2013. The series has now being lifted into a whole new league in terms of performance level with an array of features provided as standard.

"The HBE Dynamic series addresses increasingly stringent market demands for ever more efficient, more economical and more precise sawing machines. Increased performance coupled with reduced energy consumption, lower space requirement without compromising occupational safety or handling simplicity," says CEO Christian Behringer, as he describes some of the stipulations followed in the development process.

The new HBE Dynamic series is available in five model types 261A, 321A, 411A, 511A and 663A with corresponding cutting ranges, covering an extensive field of applications in the steel trade, machine and tool building and in high-end metalworking businesses.

Smart features for the flexible all-rounder – as standard

In a new departure, Behringer GmbH is providing the HBE series complete with features designed to significantly enhance sawing process reliability as standard. The AFC (Auto-Feed-Control) is just one example: a computer-controlled high-performance cutting pressure control system supplies the data for cutting speed and servo-regulated downfeed. This provides an effective protection for tools against overloading, by tracing the back of the sawblade in real time while sawing is in process.

"With this facility, we are offering our customers premium technology otherwise only available in high-performance sawing machines," says Christian Behringer.

Impressive economy and quiet running

With a superb service life of well in excess of 400 sawing cuts in 42CrMo4 200 mm dia. material, for example, the HBE321A Dynamic has significantly more to offer than comparable sawing machines, meeting even the most challenging of assignments without hesitation. A sturdy saw frame made of vibration-damping grey cast iron and double band wheel bearings work together to ensure quiet running and cutting precision. Trials confirmed a 30 percent longer service life of bandsaw blades alongside visibly better cut surface quality. The slight inclination of the band wheels helps prolong the life of bandsaw blades by reducing fatigue due to cyclical bending.

Minimum rest piece length with optimum fixing

Given the rising price of materials, achieving smallest possible rest piece lengths can also be a major benefit. Because achieving this key benefit should not be allowed to compromise clamping safety, the HBE Dynamic series from BEHRINGER comes with a double vice as standard. The less movement occurs during machining, the better the alignment and angular accuracy. More even clamping also means a more precise cut. Material bundles and packages in particular, but also thin-walled pipes, are ideally fixed while a mechanical stop enables rest pieces to be almost completely sawn, so saving costly material.

No compromise energy efficiency

Resource-saving production, sustainability and energy efficiency are currently on everyone's lips. The rising cost of energy is driving manufacturers to rethink their existing processes and make use of technological innovations to develop new solutions which will enable higher output to be coupled with lower energy input.

"With the new HBE Dynamic series, we have proven that energy efficiency and high-powered hydraulics are not a contradiction in terms," explains Christian Behringer.

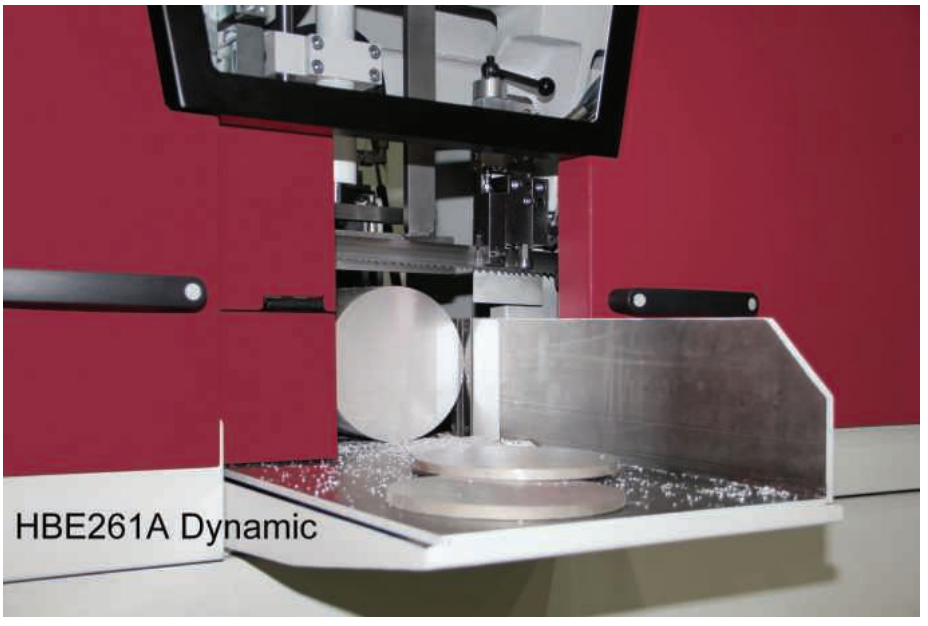
The use of modern frequency-controlled drive systems from renowned manufacturers and gearing ratios specifically configured for purpose mean that simply specifying the kW output of a motor is far from being a guarantee of high cutting output nowadays. In the HBE261A Dynamic, for instance, a sawing drive of 2.6 kW enables a high machine throughput while requiring minimal energy input – which adds up to efficient production.

The HBE Dynamic's feed gripper is designed in a rugged gantry version and mounted in floating bearings. It moves along a closed roller conveyor, a key benefit when machining shorter cuts. As re-gripping is only necessary in this machine after a 600 mm cutting length, this saves valuable non-productive time.

Proven process reliability

Lowering the saw frame prior to the cut is performed in the HBE Dynamic using a proven technology which ensures the utmost process reliability. Instead of an electronic sensor or manual entry of the height information, the height is detected by a mechanical T-bar which brings the rapid lowering movement to a stop as soon as it

senses the upper edge of the material. The engineers gave process reliability clear priority over the use of susceptible electronic systems, as these machines are frequently automated and need to guarantee trouble-free operation when operating unattended.



No-risk chip disposal

Because a carefully considered chip disposal system is vital following on from sawing cuts, this aspect was taken into consideration right from the design phase of the HBE Dynamic series. The funnel-shaped machine base enables good access for cleaning and maintenance. The chip conveyor itself can be supplied as a paddle style conveyor or worm and can be simply pulled out. To guarantee the most effective possible cleaning of the saw blade, the HBE Dynamic features electrically driven double chip brushes which clean the bandsaw blade of adhering chips synchronously while sawing operation is in progress. A quick-change device permits the brushes to be exchanged without excessive loss of time.

Functionality and design

Because the machine is fully enclosed, it not only complies with current CE directives but also addresses growing demands for user-friendly design, occupational safety and environmental protection. The benefits are evident: No contamination of the work environment, reduced noise coupled with an optimum view into the machine through the generously dimensioned viewing window. The easy-maintenance concept enables simple saw blade changeover and good access for repair or cleaning work.

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UK's first Prima Power eP 1336 variant press brake installed

Kings Lynn-based Dale Sheetmetal Ltd provides a wide range of precision sheet metal services, mainly to the food service and catering sectors but also to a growing variety of diverse industries. Established for more than 40 years, the busy family-run concern serves businesses mainly based in East Anglia, although a growing list of customers throughout the UK take advantage of the company's nationwide supply and installation service.

Dale Sheetmetal offers precision CNC punching, cutting, folding and bending of ferrous and non-ferrous sheet metals and is able to handle sheet up to a maximum of 4.0 m x 1.5 m with a thickness of 6 mm.

To increase the company's bending capacity and to further improve its capabilities in this area, company proprietor Dave Dale recently purchased an advanced Prima Power Servo-Electric Press Brake. Although smaller versions of Prima Power's eP series have previously been installed in the UK, the large eP 1336 variant, with a press tonnage 135 and a bending length of 3,655 mm, as purchased by Dale Sheetmetal, is the first of its kind installed in the UK.

Explaining the purchase, managing director, Dave Dale says: "Over the past two decades, Dale Sheetmetal has earned a reputation for delivering high quality work, on time and on budget. We are able to achieve these objectives by employing a strong team of dedicated and highly skilled engineers and fabricators and also by using the best available production and design technologies.

"We use the latest state-of-the-art CAD design/drawing software, which is fully integrated with our CNC punching, laser cutting and bending machines. Once the design has been input into our system it is sent directly via our wireless network to the control console of the appropriate machine.

"Each stage in our company's development, for instance, our recent large factory expansion, has been driven by growing customer demand. Having identified bespoke bending as a pinch-point to help satisfy rising customer requests in this area, we recently investigated the latest press brake technologies. Rather than investing in a conventional hydraulic press, in accordance with our philosophy of installing the best available technology, we only looked at next generation, all electric machines. Although a couple of alternative options would have provided many of the qualities we were looking for, Prima Power's eP 1336 proved to be the ideal machine for our needs.

"Now installed and fully operational, the speed and precision of the eP 1336 ensures that it produces high levels of consistently high quality work. In addition to satisfying existing customers' needs, the high-quality features and extra capacity created by our Prima Power servo electronic press brake will allow us to enter new markets."

Prima Power has been a true pioneer in applying servo electronics in sheet metal working. The company's first punching machine with 'green' e-technology was introduced as early as 1998. Today this technology is offered across a wide range of company products.

Prima Power has now applied a servo-electric drive system to the new eP-Series of press brakes, resulting in a fast, accurate, non-hydraulic bending solution. The innovative machine concept combines productivity, accuracy, flexibility and reliability.

The series adheres to Prima Power's ecological code 'Green Means'. Green means is a win-win policy, as sustainability and social responsibility go hand in hand with manufacturing efficiency, competitiveness and productivity. Greater versatility, lower power consumption, reduced maintenance and the absence of oil to purchase or dispose of, delivers tangible benefits. In addition, easy programming and outstanding accuracy eliminate wasted

production and allows users to make better sheet metal components at lower costs.

The eP 1336 range uses an advanced pulley belt system that is actuated by Prima Electro servo drives, distributing the bending force over the whole bending length. The system consists of fixed and moving rolls spread out over the total working length of the upper beam. The belt itself has a steel wire reinforced, maintenance free construction. It is not a tooth-belt, nor is its function based on friction, but the entire force is transmitted through tension – a simple and reliable solution. Servo motor drives offer superior movement control and accuracy, whilst thermal influences on precision are eliminated through the absence of oil.

The Prima Power eP-Brake is based on a rigid O-frame. This arrangement ensures tool alignment, even under stress deformation, as there is no horizontal displacement. The position of the upper beam, in relation to the lower beam, is measured by dual Y1 and Y2 linear encoders that are attached independent of the machine frame. This design isolates ram positioning accuracy from any deflection in the side frames under load and maintains accurate positioning even during off centre bending operations. Ram repeatability on the eP-Series is an impressive ± 0.005 mm.

The eP-series utilises the Prima Group's know-how in control technology and features the Prima Electro Open Control. For maximum processing speed this MSWindows based control has two separate processors, one for real time operations and one for bending application tasks.

An operator friendly 17" Touch Screen user interface leads to a significant improvement of data input rates and a considerable reduction in programming time. 2D graphical programming, with automatic bending sequencing, assist in making even first time operators productive.

The Prima Electro Open Control has a large hard-disc, two USB ports, a network connection and it offers access to all control functions over teleservice. Most bending applications are easily programmed by using 2D graphical on-line programming with auto sequencing. As demands may change in the course of time, it may be necessary to use 3D off-line programming and 3D visualisation of the parts in the machine control. The Prima Electro Open Control can easily be SW-upgraded at any time to meet this requirement.

AutoPOL is an easy-to-use and effective tool for off-line programming of Prima Power eP-Brakes. Sophisticated bending simulation makes it possible to shorten set-up times and to ensure already in the office that the bending task can be performed. 3D models can be created with AutoPOL's designer program or they can be imported in 2D and 3D-format from practically any CAD program. AutoPOL's bend allowance algorithm takes into account also bending tools to obtain correct radii and thus correct unfolding dimensions. The 2D unfold pattern can be exported as a DXF file to be used in programming punching and cutting machines. AutoPOL includes a 3D designer for designing of sheet metal parts, 2D and 3D file import functions, an Unfolder for automatic flat part calculation and a Bend Simulator for graphical programming and simulation.

Dan McGinty Prima Power general manager sales UK & Ireland concludes: "The eP-Brake features the advantages of high acceleration, deceleration and fast response times of the servo-electric drive system. Compared to conventional brakes, considerable productivity increases can be reached and reductions of cycle times by up to 30 percent and more are now achievable.

"Working speed is programmable to ensure bending is made without loss of product quality or operator safety. The Lazer Safe "Block Laser" system provides safe high speed closing down to just 2 mm. Compared with other guarding systems or even unguarded machines, the block laser system can save up to two or more seconds per cycle."

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Fibre laser cutting allows cycle parts manufacturer to keep pace with orders

Bicycle aftermarket component manufacturer, Hope Technology Ltd employs around 130 people and exports half of its rapidly expanding production to more than 40 countries. The successful British manufacturer's business, which was founded in 1989, was based on a quest to make mountain biking safer by developing an alternative to cantilever brakes.

Founders Ian Weatherill and the late Simon Sharp, ex Rolls-Royce aero engineers and toolmakers, developed a disc brake along the lines of those used on motorcycles. Today, the top quality brakes are manufactured in their tens of thousands annually, along with sprockets, chainrings and virtually every other component that goes onto a mountain bike, as a visit to www.hopetech.com will attest.

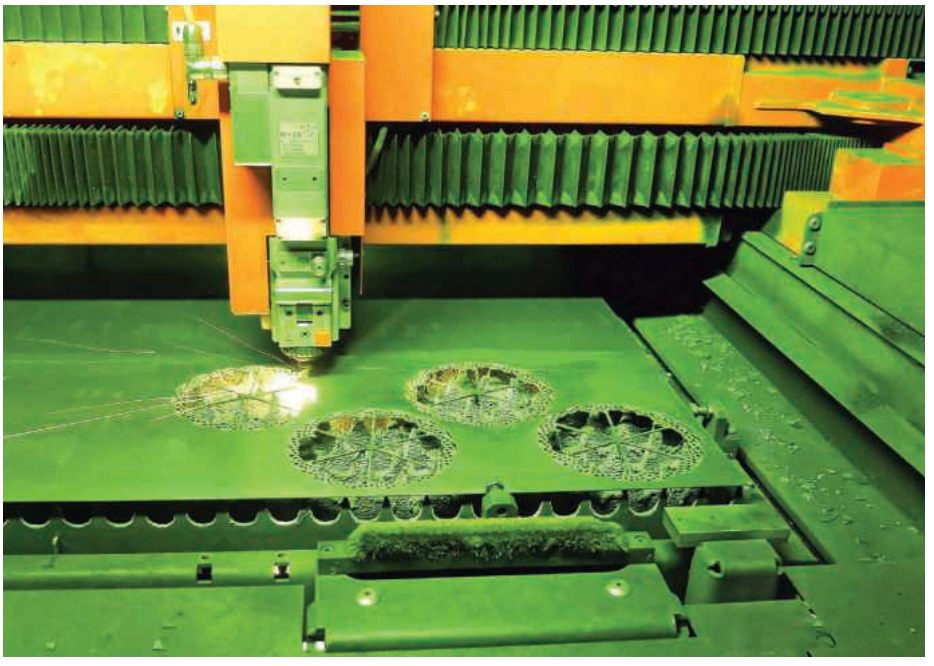
To meet demand, the Barnoldswick factory in Lancashire operates around the clock. Even so, by mid-2015 one of the 70 CNC machine tools on the shop floor, a BySprint CO_2 laser cutting machine from Bystronic UK was struggling to keep up. Hope Technology's works and production manager, Lindley Pate knew that fibre laser cutting was a maturing technology and decided that the time was right to make the change. A 4 kW BySprint Fiber 3015 machine was duly installed.

He explains: "We use relatively thin materials, such as 2 mm stainless steel for brake discs and up to 6 mm aluminium for some sprockets. For thinner gauges, compared with an equivalent CO_2 source, the fibre laser produces components three times faster. It has made a fantastic difference in helping us to meet the sheer volume of orders."

The machine is equally capable of handling much thicker material. Hope often processes 12 mm thick aluminium tooling plate to produce fixtures for other machines on the shop floor.

A further advantage of fibre laser cutting, according to Lindley Pate, is the high quality of cut using exclusively nitrogen as the cutting gas: "The as-machined edges on stainless steel appear polished, so brake discs for example need no edge finishing. They go straight to on-site heat treatment.

"This is in contrast to production on the previous CO_2 machine, which left a residue even when nitrogen was used. Oxygen as the cutting gas is not used at all here to avoid the problems associated with oxidation of the cut metal edges."



Brake discs being machined from 410 stainless steel on the BySprint Fiber 3015 at Hope Technologies (photographed through a green-tinted glass window that absorbs reflected, short-wavelength laser rays to protect the operator's eyes)

He added that other factors in favour of fibre laser cutting over CO_2 are more consistent accuracy, less machine maintenance and more economical running costs, both in terms of the amount of electricity used and the lower requirement for cutting gases. There is now no need to use helium gas at all, which runs all the time on a CO_2 laser machine, resulting in a further significant saving.

The cycle components cut on the BySprint Fiber are mainly brake disc blanks from 410 stainless steel sheet in the soft condition. The discs are either one-piece varieties or two-piece assemblies requiring an outer band of the same material and a floating centre of 2014 aluminium, which is also cut on the machine. Additionally, sprocket blanks from 7075 aluminium are produced, as well as bike maintenance tools, merchandise such as bottle openers and keyrings, and parts for display stands and trophies.

Brake discs ready for milling

Maximum sheet dimensions that can be accommodated on the table of Hope's fibre laser cutting machine is 3.0 m x 1.5 m, which is generally the size used when producing aluminium parts. In the case of the speciality stainless steel that the company buys, however, the mill supplies the sheet in a variety of strip sizes, typically 330 to 550 mm wide by 1,000 to 1,500 mm long, which are placed transversely across the machine's shuttle table ready for processing.

The variation in stock was one reason for Hope deciding not to equip the laser cutter with an automated system for delivering fresh material to the machine and subsequently retrieving the laser-profiled sheets. Another reason, as Lindley Pate points out, is that the Barnoldswick facility is

a low to medium volume manufacturer of specialised components that need not only CNC machining but also a degree of hand crafting, so large volume manufacturing principles are not appropriate.

Based on design data from Hope's SolidWorks CAD network, programming is carried out offline using a seat of Bystronic's Bysoft 7 software, which according to Hope Technology is easy to use and has excellent nesting capabilities for maximising component output from a sheet.

Laser cutter programmer Mark Jolly likes the useful scrap cut-down feature in Bysoft that cuts big areas of waste material inside a component into several smaller pieces. It avoids the risk of a large piece of scrap distorting upwards, which could damage the

Stainless steel is supplied to Hope in various sizes. Here, eight sheets measuring 1,500 mm x 375 mm are being laid across the shuttle table of the BySprint Fiber 3015

laser nozzle travelling 1 mm above the sheet. He also appreciates the ease with which the engraving function can be called up at the control by backing off the power output from 4 kW to 600 W.

Lindley Pate concludes: "We have always believed in making everything in-house from top quality materials, either solid billet or aluminium forgings. We not only machine everything ourselves on CNC equipment to control precision and quality but also heat treat, anodise, polish and assemble on-site.

"We are even branching out into in-house carbon fibre production, which will result in handlebars, seatposts and even a complete bike being available.

"The Bystronic fibre laser has become an essential tool at the start of the production routes for brake discs and sprockets. There has been minimal downtime since the machine was installed, which is essential as we only operate one laser, so it has to be reliable as otherwise production would stop."

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The Sheet Metal MES

Over time, production management has become the key factor in productivity and competitiveness for companies in the sheet metal industry, far beyond other factors that have traditionally been very important such as use of material, calculation of times and costs, elimination of paper, and acceleration of the information transfer process.

An MES (Manufacturing Execution System) is a software system used in production that controls and records the transformation of raw materials into finished products. An MES provides information that helps make decisions on how to optimise production based on the current conditions of a production plant. An MES normally works in real-time and is connected to the rest of the existing management systems and production elements. It allows for the control of multiple elements involved in the production process: requests, personnel, machinery, or support services.

From Lantek's point of view, an MES adapted to companies that produce sheet metal pieces, tubes or sheet metal profiles is composed of the following functional units:

Management of product definition

This includes the assignment of its location in warehouses, version control, and exchange of information associated with each product with other systems. It provides key information to the plant manager, such as production routes, cutting technology, itemisation of materials, or specific characteristics (geometry, material, thickness), all focused on defining how to produce a piece or product.

Resource management

This includes the registration, modification, and analysis of information associated with each resource, either human or material (workplaces, if the material is to be cut or not), aimed at preparing production orders using the most appropriate resources in terms of capacity and availability.

Based on this structure, a set of data associated with production is created that, with the appropriate analysis tool, may be processed and made available to the manager or higher-level systems.

Production scheduling

The production of sheet metal pieces, tubes, or sheet metal profiles is rarely a process that can be planned out in the medium term. Agility, flexibility, and continuous change are desirable characteristics in a metal production plant environment. Furthermore, in the workshop it is necessary to plan out minute details almost immediately, depending on the situation.

Lantek assumes that, in this environment, no one knows how to resolve each situation better than the workshop manager. Therefore, well-organised information is provided to him or her so that timely decisions can be made as quickly as possible, scheduling the work orders that best meet the established requirements and priorities.

These systems must be connected to the business management systems so that business-related constraints can be applied to this schedule.

Planning of work

This includes the creation and distribution of work to the workplaces. In this step, an appropriate consideration of the concept of nesting, in which pieces from different orders and/or clients can be grouped together, becomes vitally important.

Execution of production orders

Although the actual execution is performed in process control systems (Lantek Wos), the MES system can perform checks on resources and report on the progress of various production processes to other systems.

In this case, it is also important to have a view of nesting in addition to the work order or request and have the possibility of making last-minute changes to already-set schedules.

Collection of production data

This includes the collection, storage, and exchange of process data, the status of the various pieces of equipment, pieces pending/in process/finished, real times, material used, and scrap generated. Lantek has different systems (Lantek Wos, Lantek Workshop Capture, Opentalk) to deal with the different scenarios that may occur in an operating workshop.

Analysis of production performance
This includes the creation of data and information from the raw data generated during production processes. For example, it can provide OEE (Overall Equipment Effectiveness) performance indicators or any other pertinent indicator.

Monitoring and traceability of production
Recording all of the information related to production makes it possible, both in real-time and once the process ends, to know the status of any element during its processing in addition to the materials and resources used in its manufacture. This makes it possible to regulate quality and traceability when it is necessary to search for the causes of irregularities.

Integration
An MES system by itself is meaningless in a company today. Integration with other operating systems or company or business management systems is essential for making correct decisions in line with the company's objectives and strategy.

Lantek includes various mechanisms for interconnecting ERP/MRP services (Powersync, Avantiaservices) with machines themselves (Opentalk) or even with external CADCAM systems. This makes an MES into an open system that cooperates in a dynamic, seamless way for the user along with their environment in the points of the process where it is needed, whether it is definition or validation of production. These mechanisms are possible thanks to the software platform the system is based on, which grants unlimited power of connectivity, even in real-time.

A client that wants to implement a management system in a scenario where there are several companies related to sheet metal, but in which all are not centred on cutting pieces, with several production, logistics, and sales centres and that, given their turnover and the financial control involved, needs a financial ERP able to provide analysis in that area and must choose very carefully which software is going to be used in the specific management of their cutting centres.

The Lantek MES is in charge of providing the solution as it is integrated with an ERP software with specific intelligence on metal production, extending and supplementing what the ERP generally manages.

This solution allows you to focus on optimising the metal, mixing different orders/projects in the same work units, achieving the best possible use of resources, and maintaining the ability to control each piece in detail (which operator and machine processed it, what date and at what time, on what material, etc.)

Lantek Manager is the ideal MES for transforming sheet metal, tubes, or sheet metal profiles because it is a system that is specific to metal. It is modular, scalable, integrated "to the core" with Lantek CADCAM software, capable of openly and dynamically collaborating with any system (machine, software) and is accessible from any type of device (web, mobile phone) and from any point.

Lantek provides software solutions CADCAM/MES/ERP for companies fabricating sheet metal, tubes, and beams with any cutting (laser, plasma, oxy-cut, waterjet, shear) and punching technology. Lantek integrates the most advanced nesting software in the industry with the highest standards in manufacturing management solutions.

Its capacity for innovation and its firm commitment to internationalisation and emerging markets have led Lantek, founded in 1986 in the Basque Country and with central offices in Vitoria-Gasteiz (Alava), to devise a global-local strategy, which has meant it has become a global reference within the industry with its CADCAM/MES/ERP solutions. Today, the company has over 18,000 customers in over 100 countries and its own offices in 15 countries, in addition to an extensive network of distributors that are present throughout the world. In 2016 its international operations provided 85 percent of its turnover.

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New TRUMPF TruPunch 1000 performs 50 percent faster

Thanks to its investment in the latest TruPunch 1000 CNC punching machine from TRUMPF, Birmingham-based lighting manufacturer Candela Light is enjoying a 50 percent increase in production speed, and hence throughput, over its two previous turret punch presses. The machine was purchased alongside a TRUMPF TruBend 3066 CNC press brake and the latest TRUMPF TruTops Boost software that allows the company to generate programs at the touch of a button.

For over 30 years, Candela Light has played a key role in numerous major decorative lighting schemes in both the private and public sector. The company, which is one of the few truly independent lighting manufacturers in the UK, supports projects from early proposals and lighting designs, right through to commissioning and production.

Having experienced strong growth in the past 12 months (Candela now employs 28 people), the company decided to reinvest some of its profits back into the business. A particular focus was Candela's turret punch presses, which were ageing and had become a little unreliable.

"We knew that technology had moved on, so we decided to assess the main players in the market to see about buying a replacement," explains managing director, Nigel Astley. "At first, we thought about replacing the turret punches with a fibre laser profiling centre, but the TRUMPF representative explained that we would be much better off with a TruPunch machine based on the type of parts we process. As a result, we invested in the TruPunch 1000."

The TruPunch 1000 offers ideal entry into professional punch processing and has all of the capabilities expected of a TRUMPF punching machine. In addition to pure punching, the forming of threads, making of extrusions and bending of flanges are also possible, thus offering cost-efficient, complete processing in a single clamping.

"Unlike our previous turret punches, which only had a couple of auto-index stations, all tools on the TruPunch 1000, including TRUMPF's unique MultiTools, can be rotated through 360°," explains Nigel Astley. "Furthermore, the machine is 50 percent faster than our previous capability and we no longer have to remove parts from a skeleton frame and perform deburring."

In terms of eliminating secondary operations, the TRUMPF machine at Candela was ordered with almost all of the extra functions available, including MultiTool, MultiShear, MultiBend, Tapping (with breakage control for tapper), Marking/Rapid Beading, Engraving, Deburring and Roller Technology.

Since its installation in June 2016, the machine has been set to work producing the metalwork for Candela's extensive range of contemporary and heritage lighting products, lanterns, columns and brackets. Although the TruPunch 1000 can process sheets up to 6.4 mm thick, Candela typically processes aluminium up to 4 mm and copper and brass up to 1.2 mm. The company also manufactures parts from stainless steel. Candela makes to order, rather than for stock, and batch sizes can range from 20 to 300-off.

Having identified the TruPunch 1000 as the answer to its requirements, Candela also asked TRUMPF to provide a replacement press brake and new manufacturing software.

"We wanted a single supplier so that we would only require one training programme and one service contract," says Nigel Astley. "With this in mind, we invested in a new TRUMPF TruBend 3066 CNC press brake and TruTops Boost software."

He says that the downstroking functionality of the TruBend 3066, as opposed to the upstroking configuration of the company's previous press brake, means Candela can use the machine's bigger throat to accommodate larger parts.

"Furthermore, the 3D visualisation technology offered by the TruBend machine means we can use unskilled labour," he adds.

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Quick and systematic tool change

Bending of tubes with diameters of up to 127 mm is continually growing more demanding, while the subsequent costs are approximately zero.

"It isn't only about implementing technical efficiency in processes or machines anymore," says Stefanie Flaeper, managing director of transfluid. "Most of all, the increased demands to new products must be implemented here. No matter the time efficiency and precision, the solution should, of course, be controllable." The German specialists have developed their tube bending machine to bend DB 40120-CNC-VE for this. It permits bending radii of 1 x D at very low wall thicknesses in such tubes.

In the scope of a current project, the setup of this special bending system has been implemented fully electrically. All movement axes are optimally synchronised by the special transfluid sequence control or can be programmed controlled against each other. Additionally, it is possible to easily optimise the process via this sequence control, which effectively improves product-specific cycle times. Another strong point is simple operation. All parameters can be taken from the CAD and the corresponding form spanners can be called automatically as required. The transfluid engineers have implemented reduction of the subsequent costs by an automatic spanner change system. The time frame for tool change is comparable to that of a radius change.

The new DB 40120-CNC-VE has two tool levels. It is able to change the spanners eight times, so that each tube can be bent even in highly complex geometries. This form of tool equipment is particularly efficient, reducing subsequent costs to a minimum.

"Because the diameters are relatively similar and radii are very narrow at 1 x D, only the course geometries really change in new products. This means that only new spanning elements need to be used," explains Stefanie Flaeper.

To implement the narrow radii at a relatively low wall thickness, the new pipe bending machine has an additional pusher device that can controlledly guide even the last bend at short remaining lengths.

The new pipe bending machine DB 40120-CNC-VE by transfluid changes tools automatically

Watch the video at:
https://www.youtube.com/watch?v=Br6ZqXje2DI

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www.tube-processing-machines.com

The Endeavour from FICEP

Fastest ever automatic CNC line for drilling, milling and marking for beams channels and flats

The Endeavour is the world's most innovative CNC beam line which features three new direct drive, 31 kW, 5,000 rpm spindles with additional auxiliary axis movement, high speed positioning, four sides scribing and hard stamping marking unit.

Once a beam is clamped in position, drilling, milling and marking can be undertaken simultaneously on all four sides of the beam without any further actions by the operator. Each drilling head moves rapidly and independently from one programmed position to another along the stationary beam for further drilling, milling or scribing.

Machining is therefore much faster resulting in remarkable increases in productivity and reductions in production costs.

Endeavour can be used as a stand-alone machine in combination with a high-speed Katana CNC saw or a coping unit with plasma or oxy robotic thermal cutting heads. When combined with the Katana, a patented magnetic unloader allows the drilling and sawing of short pieces without operator intervention.

Higher productivity features include:

- Much faster drilling, milling and scribing speeds
- Helical milling features
- Milling applications for pocketing
- Weld preparation capability
- Slotting in any direction
- Auto detection of the profile size
- Processing of tapered beams
- Easy access to the working unit and tool changers
- New swarf collector design
- Easier cleaning

Andrew Hirst, managing director of the UK's largest independent steel stockholder, Barrett Steel Services, says: "We already had FICEP saw drill lines but we wanted to

further increase our processing volumes and to meet our customers' requirements. The Endeavour was exactly what was wanted and fits perfectly into our existing production lines, helping us to further enhance our customer services and delivery times."

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MBA Engineering are the only independent service provider to sell the Kimla Fiber Laser whilst offering service and support for everything Bystronic.

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- We strive to offer an **unrivaled** level of support to our **valued** customers.
- Our Service packages are **tailor made** to suit your production to ensure your costs are kept to a minimum.

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