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Smooth operator

Mazak marks start of CNC revolution with SMOOTH TECHNOLOGY debut

Yamazaki Mazak is set to revolutionise the world of CNC and deliver a step-change in machine control and performance with the European launch of its SMOOTH TECHNOLOGY, at a dedicated Open House in May.

SMOOTH TECHNOLOGY incorporates the new MAZATROL SMOOTHX CNC alongside new machine hardware and servo systems to deliver an improved operator experience, faster machining times and further integrate CNC into the overall factory management system. The result is a breakthrough in CNC which uses intuitive operations in a similar manner to smartphones and tablets.

Those wanting to experience the power of SMOOTHX firsthand can register for the dedicated Open House, which will celebrate the technology's official European debut on the 13th–15th May 2015, at Mazak's European Headquarters in Worcester. To register for places, simply visit **www.mazakeu.co.uk/SOH**

The launch event will showcase SMOOTHX's versatility as the new control system will be installed across five different machine tools, demonstrating the technology's compatibility across a wide range of machining applications, from turning and milling to multi-tasking and full 5-axis machining.

As with all Mazak technology, the new SMOOTHX is designed with ergonomic comfort for the operator front of mind. The operating panel boasts a 19 inch touch screen which is 36 percent smaller than its predecessor and can be rotated to suit the posture of the operator.

Crucially, SMOOTHX is capable of ultra-fast processing speeds up to four times faster than its predecessor, enabling it to respond to the demands of the latest generation of servo motors employed.

The launch of SMOOTHX also marks a major leap forward in usability with the development of the new Smooth Graphical User Interface (GUI), designed in conjunction with the world famous industrial designer Ken Okuyama. It features five new process home screens that present critical data in a single page view, whilst simplifying the key operational stages: from part programming, management of tool data and setup, through to the actual machining cycle and machine maintenance.

Additionally, MAZATROL SMOOTHX includes a range of new MAZATROL programming functions such as Intelligent Pocket Milling, which can reduce machining time by up to 60 percent compared to conventional offset toolpaths.

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Oil and gas sector fuels major investment

A Scottish engineering firm has made a major machine tool investment in order to meet the increasing demands of the country's booming oil and gas industry.

Gall Engineering, located just outside Kintore, Aberdeenshire, has grown rapidly in recent years and its latest addition, a 5-axis multitasking machine tool in the shape of the Yamazaki Mazak INTEGREX e-500H II, is the largest piece of equipment to be purchased since opening its new machine shop five years ago.

The INTEGREX e-500H II has a large machining envelope ideally suited for the machining of long shaft work pieces up to 3000 mm in length, commonly associated with the components required by the oil and gas industry. With a maximum main turning spindle speed of 3,300 rpm, the INTEGREX e-500H II is also capable of accurately handling traditionally difficult-to-machine materials required by the industry such as Inconel.

(l-r) Dennis, Stewart and Janice Gall, with a Mazak INTEGREX i-400 machine tool, at the MACH 2014 exhibition in Birmingham

Stewart Gall, director of Gall Engineering, comments on the investment: "The new INTEGREX e-500H II will enable us to machine many of the bigger components required by the oil and gas sector, which has been a mainstay of our business. It is capable of Done-in-One machining; in other words we can complete difficult machining operations, such as turning and milling on one machine, with one operator and one setup. This ability to combine operations on one machine has the potential to dramatically increase our production capacity and overall efficiency."

The INTEGREX e-500H II multi-tasking machining centre is a complete fusion of CNC turning centre and machining centre, forming what Mazak considers by far the most advanced multi-tasking machine in the industry.

Complete all operations in a single setup of turning, milling, boring, drilling and more, it delivers precision and performance for heavy, large-diameter, shaft-type workpieces for a wide range of industry applications.

The machine is equipped with high-output integral spindle motor with two gear ranges for a wide scope of heavy-duty machining. A drop-worm system that performs with the same positioning accuracy as a machining centre rotary table drives the machine's C-axis (0.0001° increments). The high performance milling spindle is a 50 taper with a single spindle turret with automatic tool changer. A heavy-duty roller gear cam makes up the framework of the B-axis that provides indexing or contouring for maximum tool point agility.

Fully programmable, servo driven, steady rest and tailstock ensure safe and accurate machining of long workpieces.

The roots of the Gall Engineering business lay in metal fabrication prior to the opening of the new machine shop. However, the company now has five Mazak machine tools in operation at its Kintore site: an INTEGREX i-400 5-axis multitasking machine tool, a VTC 800 vertical machining centre, a QTN 400 and QTS 250 CNC turning centre, and its most recent acquisition, the INTEGREX e-500H II.

Stewart Gall continues: "We have doubled our production in the last two years and have plans to expand our machine shop further as demand continues to increase from the oil and gas sector. We are working to exceptionally high tolerances with many of the components required by our customers and require highly accurate machine tools in order to fulfil our orders."

"The strength of the oil and gas sector and overall health of the Scottish economy gives us great hope for the future. We are already looking to expand our machining shop further and anticipate that our capacity will have tripled by the end of the year."

Scott Hunter, managing director of ScotMaz, Yamazaki Mazak's Scottish agent, which has worked closely with Gall Engineering throughout the purchasing stage and aftersales support for all of the company's machine tools, adds: "It's been a real privilege to see Gall Engineering grow from a fabrication company, to being one of the most successful engineering machine shops in the area.

"We started working with Stewart, Dennis and Janice in 2009 and have helped them gradually transition the business from turning applications into multi-tasking machining. Now, with the INTEGREX e-500H II, they have the capability to machine the long-shaft workpieces often demanded by the oil and gas sector."

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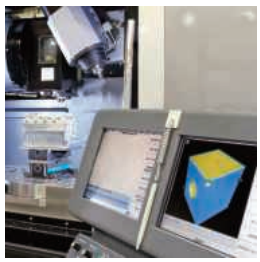

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Investment drives growth for Askey

Now in its third decade, Wolverhampton-based subcontractor, Askey Precision Engineering has built an impressive client base across a number of industry sectors, including automotive, defence and aerospace. Through further investment in people and equipment it is now targeting further growth, particularly in the oil & gas sector.

The current mix of work at Askey Precision Engineering is conveniently split 50/50 between bespoke design and manufacture projects, such as specialist tooling for robot welding applications and general make to print work as a supplier to the MOD and BAE Systems, among other blue chip customers. Its machine capacity list reflects the type of work that it undertakes, with a maximum component weight of five tonnes being accommodated on its range of borers, mills and lathes. The most recent addition to this capacity list is an XYZ XL 780 lathe that is adding a different dimension to existing turning capacity.

The XYZ XL 780 lathe installed at Askey Precision Engineering is operated by Harry Willis, who with no CNC experience was programming and operating the machine after just a few hours training

"We have lathes with a bigger swing than the XYZ XL 780, but the extra bed length and 40 hp spindle allows us to take on work that we couldn't have done previously", says Colin Askey: "we are also transferring smaller jobs to the XL 780 as we find it very efficient for high volume metal removal,"

The XL 780 features a 780 mm swing and 3000 mm between centres and a massive, one-piece, 500 mm wide cast bed. These features combine to create a heavy-duty and stable machining platform for long and large diameter components.

"The added capability that we have since the arrival of the XL 780 will be of benefit to us as we target growth in the oil & gas sector. In spite of the current low oil price, we still see this as offering massive growth opportunity for us and our aim is to become a Tier 1 supplier to this industry. To achieve this aim investment is crucial and this means in people as well as equipment such as the XYZ machine. Our view to staff development is if they see something they want to achieve, and it will also benefit the business, we are happy to support them, as we recognise that finding and retaining skilled people is vital to our long term goals."

One of these skills issues is that of CNC operators. Askey Precision Engineering has focused its control technology on full G-code systems up until the arrival of the XYZ XL 780, which is equipped with the Siemens 828D Shopturn control featuring conversational programming software. This software allows users to program complex parts quickly and easily even with limited programming experience. The confirmation of this is that the XYZ machine at Askey is operated by Harry Willis, who while being a highly skilled manual turner, had no experience of CNC. With half a day's training, he was happily programming the XL 780 by himself.

"I was always a fan of G-code and dismissed conversational programming to a certain degree as I preferred to be, what I thought, fully in control of programming," continues Colin Askey. "However, having witnessed the ease of use, the effectiveness of the built-in cycles on the Siemens control I am converted and am now convinced there is no need to be able to read G-code anymore. Any turner worth his salt should be programming and cutting metal on this XL 780 machine within a few hours. We also now find that setups are reduced to a few minutes as well due to the simplicity of the whole system."

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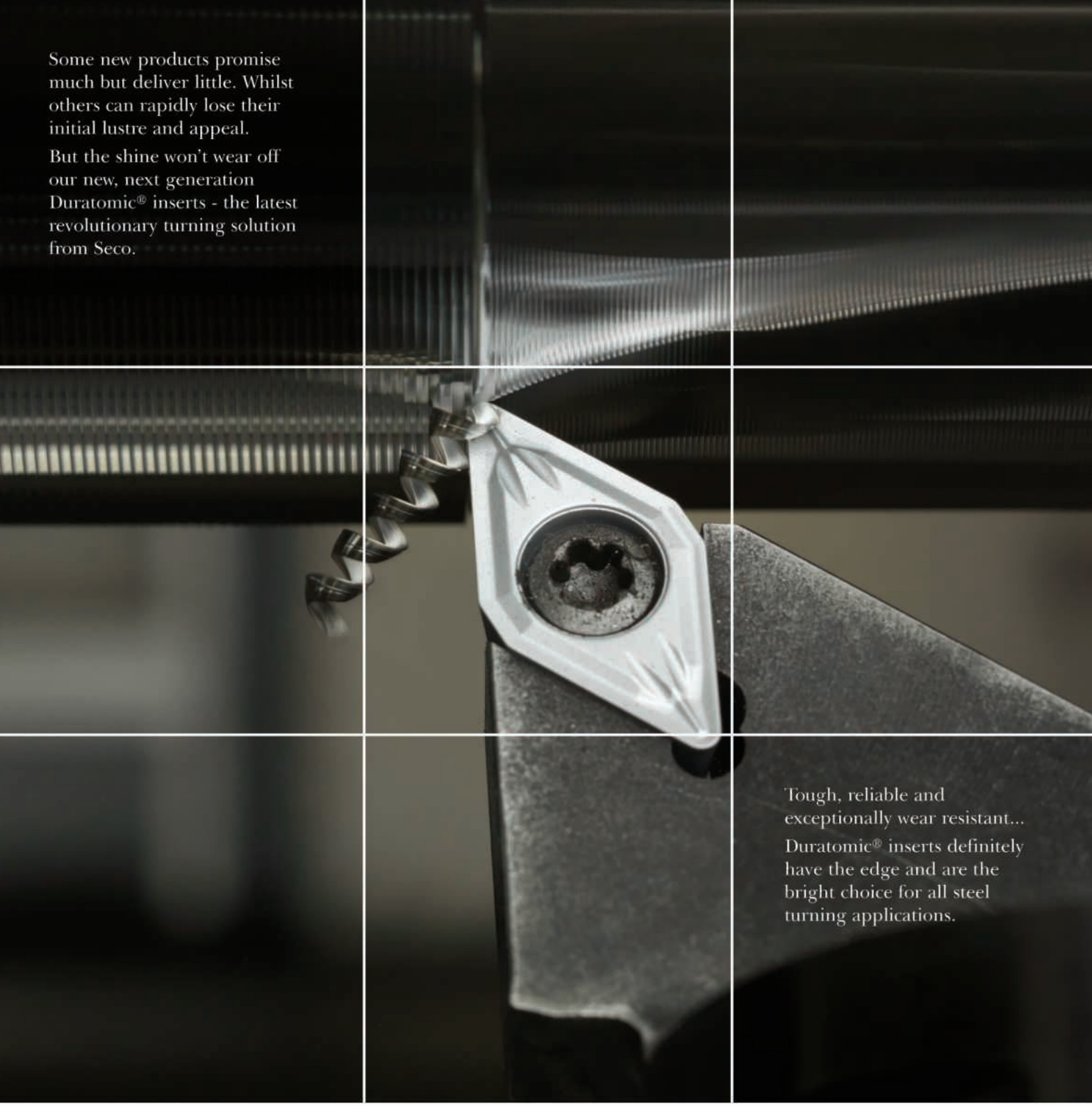

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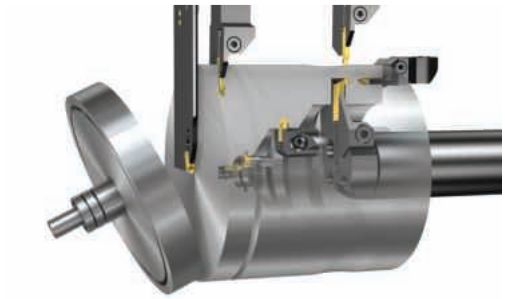
How to make API groove machining more cost-effective

A new solution is available from Sandvik Coromant for the machining of API grooves. SpiroGrooving™ is now able to reduce machining costs far beyond previous levels.



Parting and Grooving – CoroCut - QD, 1-2, Q-Cut, MB, XS applications

API seal ring grooves are a vital feature of pipelines, valves, pumps and pressure vessels. Typically, these grooves have to be produced in high quantity and to short lead-times. Adding to the challenge, tough workpiece materials are specified that include including Inconel-clad steel, stainless steel and even solid Inconel alloys, while precise dimensional tolerances and surface finishes (Ra 0.4 to Ra 0.8 µm) are also required. Often part of hectic production schedules, any mistakes bring costly consequences in the form of expensive scrap, lost labour time and additional rework. In short, machining API grooves provides ample scope for improvement.

So, what do these grooves look like? Well, common API groove types, such as R, RX or BX, mostly offer diameters within the 75 to 160 mm range, while groove height is usually below 10 mm (the walls of the groove are inclined at a standard 23°). The sealing area of an API seal ring is comparatively small, with high contact pressure providing high reliability in oil field operations. As a result, correct machining is critical.

Fortunately, a new dedicated solution is making API groove machining easier, faster and more cost effective than using traditional plunging and radial turning operations. These necessitate roughing and finishing operations involving high cutting forces that limit tool life. Moreover, plunging and radial turning processes are slow and costly with no flexibility regarding the size of groove diameter. Both machining and tool costs are high by any standards.

In contrast, the latest, more sophisticated approach features a new type of indexable insert tool and methodology. It is based on proven concepts and innovative machining, and performs efficient, light-cutting circular ramping simultaneously on the OD and ID of the groove. The new 'SpiroGrooving process offers a host of benefits when machining API seal ring grooves, namely: considerably reduced cutting time through higher cutting data; exceptionally high process security; wide application flexibility with minimised tool inventory; ease of application; and simple set-up procedures.

SpiroGrooving an innovative method for seal ring grooves

SpiroGrooving is a trademark for a patented innovation in machining grooves for sealing rings. Clever use is made of a dedicated cutting tool, rather than brute force, making the machining process more efficient and secure. The programs for SpiroGrooving are produced, with relevant application data, using a proprietary calculator/generator featuring a user-friendly interface.

CoroBore XL the tool for SpiroGrooving is an uncomplicated, clever, twin-edge tool with two V-style inserts based on the CoroBore XL boring system

Where conventional methods require a new set of tools for every groove type or size, one SpiroGrooving tool covers a range of diameters, providing flexibility in production and a minimised tool inventory. Furthermore, a single tool performs both rough and finish machining. The SpiroGrooving tool is of uncomplicated, clever, twin-edge design with two V-style inserts based on the CoroBore® XL boring system. The plate of the tool has two individual, radially adjustable sliding plates that also offer bolt locking to maximise tool stability. The tooling can be combined with various machine spindle interfaces, such as Coromant Capto and HSK, as well as extensions and reductions to suit tool assemblies. Each slide has seats with serrated locking couplings for the two cutting heads. There is full radial adjustability within the groove diameter ranges for each tool from 50 to 290 mm. Tool setting is a simple procedure where the OD and ID cutting edges are set according to the pitch required for a specific groove diameter.

The tool path itself is one of tapered, circular ramping where cutter engagement is in accordance with a set ramping pitch for each revolution. The only setting necessary relates to the tool diameter, which has to correspond with that of the groove at the top. Based on a few parameters, such as groove diameter, process pitch (usually 1 mm for Inconel and 2.5 mm for steel) and the selected maximum chip thickness (typically 0.18 mm), the calculator then generates the program. Further good news is that the load on the cutting edge is minimal and produces a chip-thinning effect. This allows high cutting data with short machining times, while chip control surface finishes are also impressive.

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Westcut flies high with the help of Sodick wire EDM

Westcut Engineering, a leading supplier of manufacturing services to customers across the UK, is using its investment in a new Sodick SLC600G wire EDM to help boost the company's appeal to the aerospace and defence sectors. Installed by Sodi-Tech EDM at the company's Melksham facility in August 2014, the investment was supported by the Government's Regional Growth Fund.

Established in 1985, Westcut Engineering has grown to become an established and trusted manufacturing partner to a host of blue chip customers. With origins in toolmaking, more recently the ISO9001:2008 accredited company has diversified into numerous specialist fields, including pressing, machining, EDM, prototyping and waterjet cutting.

"Many industries have found our wire erosion machining can offer major benefits due to the very close tolerances that can be maintained," says Westcut director, Richard Poulton. "However, with this new investment I feel we can attract more work from sectors such as aerospace, defence, Formula One and nuclear. Using the Sodick SLC600G we can produce very complex shapes that would otherwise be difficult to produce with conventional milling techniques. We are also able to process hard materials to extremely close tolerances, as well as very small workpieces that might be damaged by conventional cutting tools due to excess pressure."

The thinking behind the investment is to boost accuracy for both current and new customers, which in turn will lead to technically better products.

"We already have Sodick wire EDMs but they are rather old," continues Richard Poulton. "Looking around at new machines we could see the technology had changed massively. While we considered a number of different models, we wanted to stay with Sodick because of the good relationship we had built with Sodi-Tech and the excellent service they provide."

Three operators at Westcut are trained to use the Sodick SLC600G, a machine that offers Sodick's digital Smart Pulse generator and linear motor system, along with the latest HMI featuring 19-inch touch screen colour control. Courtesy of the linear drives, the machine comes with a 10 year guarantee for positioning accuracy. It has been set to work producing mainly finer wire machined parts for aerospace industry customers, often from materials that include titanium and aluminium. Batch sizes are in the realm of 10-100 off.

"Although the machine is busy producing aerospace parts, we want to attract more, as well as Formula One components and work for the nuclear industry," explains Richard Poulton. "The latter is particularly interesting due to the developments at Hinkley Point, which isn't that far from here."

Essentially, the 18-employee company will tackle any complex parts demanding accuracy. Richard Poulton says that the ability of the machine to produce glass-like surface finishes is another potential benefit for customers. Furthermore, loading the machine with multiple components simultaneously (size permiting) and the ability to run unmanned overnight, thanks to automatic re-threading in the event of wire breakage, means highly cost effective parts manufacture.

"Our wire EDM production is much more reliable with the Sodick SLC600G, and requires far less operator intervention," he adds. "We also have greater confidence in the accuracy, while programming is now easier. All of these things aid efficiency and mean we have a much better offering for our customers. Ultimately, the installation of the Sodick and our investment in other machines is one of Westcut's competitive advantages. We recognise the need to improve on a continuous basis to deliver the quality that our customers need and expect."

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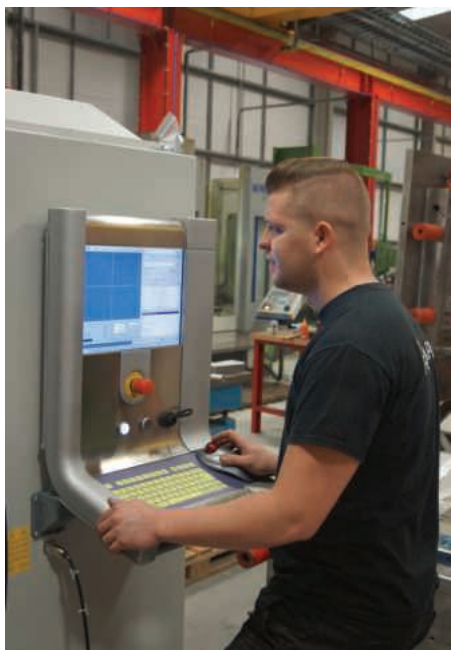
ONA EDM supports Formaplex's world-class manufacturing solutions

Formaplex is a dynamic manufacturing group using innovative processes and state-of-the-art manufacturing techniques to deliver cost-effective, superior tooling and component solutions to customers across many demanding sectors. Here, an ONA bridge-type EDM machine is supporting the company's moulding and tooling operation.

Formaplex has been working with many Formula 1, motorsport and aerospace customers since its foundation in 2001. The company operates 24/7 to provide the manufacture of master patterns, components, tooling for composite part manufacture, and finish machined composite parts in-line with the demanding requirements from these high-tech industry sectors.

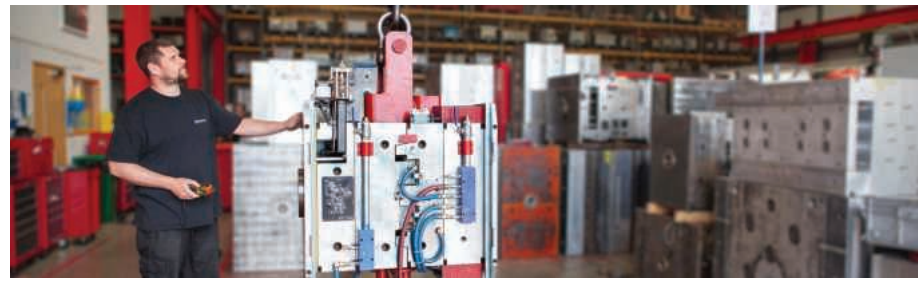
As a Tier 1 supplier to low to medium volume automotive customers, including demanding prestige brands and sports cars, Formaplex provides integrated services including design support and advice, manufacture tooling, and supply injection moulded plastic parts and composite parts to meet delivery schedules. Parts are supplied as individual items, complete assemblies, and where required, are finished and painted.

Formaplex operates from three sites on the South Coast which collectively span over 140,000 ft^2. The company also designs and manufactures injection mould tooling for many of the components required by most of the high volume car manufacturers. Operations director, Chris Carter, comments: "With extensive capabilities and a very experienced team we are a preferred supplier for the design and manufacture of injection-mould tooling for key Tier 1 companies supporting the high volume automotive industry throughout Europe."



The toolroom at Havant produces new mould tools for low volume production and also modifies tooling, where manufacture is outsourced to global partners.

"I've been in this business over 30 years. Most tools will require minor modifications between design and production. It's the nature of our business. Once tooling goes into operation, quality control will identify any glitches and the necessary changes can then be made," says Chris Carter.



Growing demand for Formaplex's services highlighted the need for a large EDM machine, as the volume of this work was increasing. By mid 2014 the decision to invest was taken, as Chris Carter explains: "My experience with ONA EDM machinery goes back more than two decades, and I have purchased a number of the company's EDM die sinkers from UK agent, Warwick Machine Tools (WMT), over the years. I have always had professional service and support from WMT and the machines are very durable, robust and reliable. With ONA we are buying quality machinery that we can depend upon to meets our requirements and to perform under extensive operation."

For ease-of-access to load and unload the large mould tool components, Formaplex wanted a bridge-type machine. Although this specification was not available, ONA had a suitable machine that could be rebuilt and retrofitted with completely new components. Other than the cast structure the ONA PX S1 installed at Formaplex is completely new, with a new table, motors, scales and generator, as well as the latest ONA NX CNC system.

"With axis travels of 1,500 mm in X, 1,000 mm in Y and 400 mm in Z, the price was very competitive, and there's not really another machine manufacturer offering bridge-type machines now. ONA EDM generators are very good, and the front end is not as complicated as other systems," states Chris Carter.

While ONA die sinkers are designed to operate around-the-clock, the requirement at Formaplex is very demanding. The machine can be running for 3 or 4 days continuously.

Chris Carter recalls: "When we first set up we considered engineering a method of cutting thin, deep rib sections on a CNC miller rather than putting it on a die sinker. This was not a cost-effective or time efficient process to get a finish in the cavity. It became apparent that we could not achieve the same results with a milling machine as you can with a spark eroder, it's also faster to die sink to our tolerances and geometric form requirements."

The toolroom at Havant produces the tools used in the large mould machines. At 3,500 tonne and 1,500 tonne, these machines produce large single piece components, such as bumpers, facia and engine trays for the automotive industry. With a large 2,000 by 1,180 mm worktable capable of accepting workpieces up to 10,000 kg the machine can easily accommodate the company's mould tool components.

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Fanuc Robocut produces savings of 50 percent

A Fanuc Robocut 0iE, installed at profile manufacturer Wilks is showing its worth with massive savings on productivity.

This investment now enables the Essex-based company to produce tooling beyond the capabilities of even the highest specification CNC turning and milling centres and further enhances the ability to produce tooling to outstanding levels of precision and with lead times to match.

Established in 1973, Wilks is still a family run company and specialises in the manufacture and supply of PVC, aluminium and rubber extrusions. Over the years it has established itself as one of the leading suppliers of marine profiles worldwide and its reputation of quality together with high levels of customer service are known around the globe. Wilks is dedicated to its customers' needs, with whom it likes to develop close, long term relationships which are mutually beneficial.

In-house tooling facilities ensure that it can offer customers added support from the early stages of product development through to manufacture.

Scott Berry, joint managing director, says: "Wilks is a 25 strong, family run, manufacturing company specialising in the supply of PVC profiles globally to the marine and shop fitting industries.

"With a senior toolmaker due for retirement later this year it seemed the ideal time to investigate ways in which we might improve our toolmaking process compared to our traditional use of turret milling machines.

"Fanuc had come highly recommended to us and following a meeting with Andy Spence to discuss our requirement, we immediately felt that we had found a long term partner for our tool room rather than simply making a one-off machinery purchase.

"Being a small company we needed to be certain that any machinery investment would yield a return relatively quickly and would not create a bottleneck in tooling schedules whilst new skills were developed.

"Our minimal CNC and CAD experience was of initial concern to us but with the Fanuc's reassurance, demonstrations and ultimately a training course at their UK Headquarters we felt enthused and confident in both our own ability to deliver as well as having purchased the right machine to work with.

"Immediately following our training, the Robocut was put to work. A die that would have previously taken 40 hours to produce was programmed and set in 2 hours and cut within a further 16 hours, a time saving of over 50 percent. Even more impressive was that the tooling ran first time when trialled on our extrusion line and without need of tuning. The saved man hours can be spent on other areas such as R&D, product trials, tuning of tooling or the design of new dies.

We are now working more efficiently and experience can only see things improve further still.

"Seemingly overnight we have gone from using relatively basic methods to produce our tooling to high specification. Surprisingly the step-up has been very simple too. We only wish we had followed this path years ago."

Tool room manager, Steve Waldie adds:"Historically our extrusion tooling had to be made using traditional toolmaking skills, such as split dies. The main problems we faced was blending a round hole at the back of the die to sometimes complicated rectangular shapes at the front/exit face of the die. With these problems in mind, the process of making these dies was both time consuming and not necessarily accurate.

"Since receiving our Fanuc Robocut Alpha OiE and having completed 5 days training we were able to start cutting production dies the following week. The learning curve from a CAD and CNC Wire Eroder novice was a steep one but surprisingly rapid.

"The support that we received from Fanuc was always there whenever we required it which in itself was very reassuring and meant that delays in completing jobs were minimal. The dies we make are now accurate within microns and the speed of manufacture has been cut by approximately 50 percent.

"Now we have our Fanuc Robocut there is no looking back."

Once the Robocut was up and running, a story was placed on the company's website, as well as Facebook, LinkedIn and Google+, with links across to FANUC. The link is **http://wilks.co.uk/NewsItem.aspx?Item=97**

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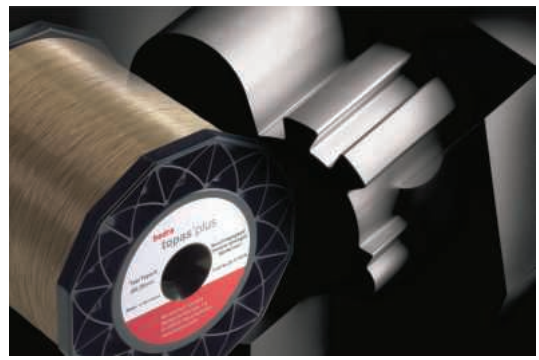
Coated wire that performs out of this world

As the UK's largest supplier of EDM consumables, Erodex is the only company to stock every wire diameter in every reel size, with all tensile strengths and with every coating option. That amounts to around 70 line items that can be sent to customers for next day delivery.

One of the greatest performance improvements comes from using coated wire rather than plain brass during the wire cutting process. Erodex supplies the complete Bedra range of high performance coated wires that can provide an increase of up to 50 percent cutting speed performance while maintaining the quality of the cut.

Sales director, Steve Rolinson says: "For the efficient application of the wire EDM process Bedra has contributed significantly to the development of technology and production processes. With the functional coatings for wire electrodes it has developed, an enormous increase in material removal performance, and hence in productivity, can be achieved. Moreover, a



reproducible high precision and surface quality is attained."

Erodex highlight the high-tech, universal Topas Plus wire cutting range that has been developed as a high speed cutting wire. Combining an excellent price-performance ratio for applications on all standard EDM machines, this range can significantly improve productivity compared to brass wire.

The Topas Plus range offers different zinc coating levels on the core of the wire to suit the various EDM machines available.

"Between the core and the coating is another layer called the Gamma Phase area that energises the material difference between the core and the zinc to give a much more powerful spark. The enriched zinc coating on a copper, steel or brass core fractures to provide an increased surface area for the spark, which increases the cutting speed," according to Steve Rollison.

Erodex provide EDM users with a cost comparison spreadsheet that will calculate the savings that could be achieved by using these new generation coated wires. Steve Rolinson concludes: "Of course the coated wire is more expensive initially. However, if you can increase the throughput of the machine tool by between 20 and 50 percent the business efficiency gains far outweigh the additional cost of the consumable wire."

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New EDM line launched

To improve capacity and capability within its machine shop, Kannect Precision has just taken delivery of an Accutex AL400 CNC Wire Cut EDM machine from CNC International. Servicing the oil & gas, power generation and injection mould industries, the Hartlepool subcontractor spotted the Accutex Wire EDM line on the CNC International stand at MACH and decided it was the right fit for producing the company's mould press tools, jigs and fixtures.

Whilst witnessing remarkable sales levels with the Accutex line since becoming the UK agent for the high quality line of CNC Wire Cut EDM machines in 2013, the Accutex AL400 at Kannect is the first UK installation of the new AL Series of linear motor machines. Since launching the new linear AL Series machines at MACH 2014, CNC International has taken a number of additional orders that are due for installation through October and November.

The Accutex AL Series' linear shaft motor drive with its closed loop control eradicates backlash to deliver a high level of repeatability with low friction and exemplary efficiency and precision levels. There are four machines in the range, from the smallest AL-400SA to the largest AL-600SA. The AL-400SA can accommodate workpieces up to 790 by 610 by 215 mm (L x W x H) whilst the large AL-600SA can accept workpieces up to 990 by 620 by 295 mm (L x W x H). This submerged line of machines has a water tank capacity from 630 to 900 litres and an overall weight from 3000 kg to 3700 kg depending upon the machine selected.

Quality is in-build with virtually all elements of the Accutex WEDM line to improve precision and productivity for the end user. For example, the AL line incorporates a rapid servo response unit that can enhance the sensitivity of the discharge gap control to improve production times by upwards of 10 percent. Furthermore, this rapid servo response unit prevents the wire from breaking to reduce downtime whilst also increasing the processing speed.

In addition, the Accutex AL Series has a high resolution signal processor that delivers a smoother velocity control than alternate machines. The result is improved stability of positional control that guarantees unrivalled contouring accuracy with a resolution narrowed down to 0.2 microns. Working in conjunction with this is the Accutex Corner Pro system that optimises data such as wire thickness, cutting data, angle and workpiece thickness. This feature automatically controls the machine parameters to achieve the best possible cutting performance. What this means, is that small and continuous corners can be processed with astounding precision. This corner precision is matched by Accutex passion for perfection that now sees the AL Series introduce its new Lead-In and Lead-out technology. This innovation reduces the commonly occuring wire-mark at the lead-in process. On alternate machines the wire mark is in the surface roughness region of 5 microns and above, but this is down to an incredible 1 micron with the Accutex Series.

With innovative solutions throughout the AL Series, Accutex has incorporated its Intelligent Discharge Unit for dealing with changing conditions such as material thickness and water flushing conditions to maintain a consistently high speed and high quality cut that reduces cutting times by over 35 percent. As well as all these innovations to offer astounding precision, quality and productivity, Accutex has also developed a 6th axis rotary table to improve flexibility and capabilities for the end user. This optionally built-in motorised spindle features an ultra high resolution of 700,000 pulses per revolution that is completely free from backlash issues. Furthermore, it can be installed as either a vertical or horizontal type.

CNC International can also supply the Accutex line with a host of optional extras that include auto wire threading, anti-collision on Z-axis, safety door interlock, transformer, remote master, auto voltage stabiliser, alarm messenger, pilot lamp, 45 kg jumbo wire feeder and high pressure water jet threading.

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Automation...action

GF Machining Solutions, the EDM, milling and laser ablation machine tool specialist and automation and tooling systems supplier, has produced a new video that highlights the significant productivity and performance benefits manufacturers can expect from automating their machining processes.

The new GF Machining Solutions video demonstrates productivity and performance advantages available to manufacturers through automation.

Entitled "Automation: The Productive Solution," it is 3.5 minutes long and can viewed on GF Machining Solutions' website

on its GF TV Channel. Using a blend of 'narrator-to-camera', voice over, machining footage and graphics, the video explains how automation can help minimise, and in some instances virtually eliminate, downtime by reducing the number of setup operations and other tasks, for example loading and unloading, requiring manual intervention. It also challenges and debunks the widespread perception that automation is only valid for specific types of manufacturing operations, for example high-volume production of same/similar parts.

The video outlines that a machine operating a 10 hour shift will be idle for 40 percent of the time but that by investing in flexible and cost-effective tooling from System 3R this same machine's productivity can be increased by more than 20 percent almost immediately.

To illustrate the power and modularity of automation, the video also shows how, by creating a fully automated manufacturing cell comprising AgieCharmilles wire and sink EDM machines, a Mikron high-speed

machining centre and a system 3R robot all controlled by powerful cell management software, productivity can be increased by an amazing 280 percent.

Another upside from such an investment is that payback can be achieved within 12 months.

The video concludes by asking component manufacturers to contact GF Machining Solutions to undertake an in-depth, no obligation analysis of their current manufacturing processes to identify how and where automation can be used to improve productivity and performance.

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Automation helps Di-Spark gain major aerospace contract

Di-Spark' s origins lie within the evolution of EDM machining since the early 1980s, but this Hampshire-based specialist subcontractor has taken its use within precision engineering to the very highest degree.

By investing in the very latest technology, it has automated its spark erosion cell by combining a System 3R WorkPartner robot with its AgieCharmilles Form 2000 HP machine to provide major advantages to its customers.

"Creating an automated production cell initially meant that we could add more efficiency and productivity to a job that was done more conventionally in the past," says production director, Philip LeClercq. " It not only gives us the ability to run 24/7, but also the assured accuracy, quality and increased productivity ensure that shorter lead times are a reality with component costs being monitored and controlled."

Working problem-free since it was installed some 2½ years ago, the automated cell was instrumental in Di-Spark securing a major aerospace components contract.

The System 3R WorkPartner robot working alongside the AgieCharmilles Form 2000 HP spark erosion machine

The WorkPartner has a compact footprint, and therefore fits into most production locations and is easy to fit with workpieces and electrodes. Palletisation allows setting up when the machine is running and facilitates continuous lights-out operation. The WorkPartner incorporates 10 positions for 320 x 320mm pallets and up to 90 positions for electrodes, allowing the machine to be programmed for a series of jobs which will have cycle times that vary from 20 minutes to 3 hours or more and

incorporating changing combinations of electrodes.

"Thanks to the WorkPartner from System 3R, the productivity of the cell is excellent and we have successfully reached our projected volume and payback targets," enthuses Philip LeClercq.

It is no wonder that the company's mantra is 'delivering productivity without compromise.'

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Continuous improvement with Doosan

Precision manufacturing subcontract specialist O.L.D. Engineering Ltd is a company committed to continuous improvement.

Integral to, and indeed underpinning, the company's improvement programmes and strategies is a positive and single-minded approach to investing in new advanced machine tool technologies as a route to improving company performance and competitiveness.

In this respect the company has, since 1995, built a strong partnership with Mills CNC and, during this period, has invested in some 21 new Doosan machines, seven of which have been installed at the company's manufacturing facility in Hinckley within the last four years.

The partnership with Mills extends beyond the supply of advanced machine tools with O.L.D Engineering taking full advantage of Mills' range of after-sales services e.g. applications, training and machine tool servicing and parts provision.

Indeed such is the close working relationship between the two companies that O.L.D. Engineering has also recently invested in smart new work wear for its shop floor staff with jumpers, fleeces and polo shirts etc., emblazoned, on each sleeve, with the Mills and Doosan logos. This move, according to O.L.D Engineering's managing director, Mary Topp, "presents a professional corporate image to visitors, and demonstrates the close working relationship between Mills and ourselves."

The new Doosan machine tools have helped O.L.D. Engineering capitalise on the economic upturn, following the slowdown in 2007/08, enabling it to significantly expand and diversify its customer base.

A quick look at O.L.D. Engineering's most recent Doosan machine tool acquisitions is illuminating, and explains the company's new technology investment philosophy.

The machines in question, 1 x Puma 600 (large capacity) lathe; 2 x Puma 400 lathes and 2 x Lynx lathes with driven tooling, a VM 960L vertical machining centre and 2 x VC 500 (twin-pallet) vertical machining centres, are all high-productivity, multi-tasking models. They demonstrate that O.L.D. Engineering's rationale, when investing in new machines, is concerned more with 'improving manufacturing capability' as opposed to merely 'increasing machining capacity'.

Mary Topp says: "Multi-tasking machines make us more productive and increases our flexibility. The sectors we serve are highly competitive, so the technology we invest in has to help us make precision parts faster...better and more economically than the competition.

"This is especially true in 'new' sectors and with 'new' customers, where we need to demonstrate and provide compelling reasons for customers to change from their incumbent suppliers."

The Doosan machines purchased by O.L.D. Engineering enable the company to manufacture completed parts in fewer setups and in reduced cycle times, both of which help reduce operational costs and help the company meet their customers' stringent delivery schedules.

O.L.D. Engineering machines precision components from cast iron, aluminium and steel through to stainless and more difficult-to-machine materials for a diverse and growing range of customers operating in the power generation, electronics, fluid power, packaging, automotive and motorsport sectors to name but a few.

The parts themselves are equally varied too and include everything from prototypes and one-offs, on one hand, through to small-to-medium batch production, on the other.

Mary Topp says: "Without multi-tasking machine tools we would find it difficult to cope. We would have to transfer parts between machines and, as well as such action potentially affecting component accuracies, the resulting bottle-necks would seriously compromise our operational efficiency''

Flexibility is important for most precision manufacturers but is especially pertinent to O.L.D. Engineering. The company, since the early 1980's, has manufactured parts including shafts, manifolds, elbows and connectors for a leading diesel engine OEM, and during the 1990's became a preferred supplier to this customer, a position it still holds to this day.

Whilst the regularity of this work is naturally welcomed there are dangers associated with such a relationship.

Mary Topp explains: "We value this customer's business but don't want to be too dependent on it because if it slowed down for any reason, the knock-on effect would be damaging to us''

O.L.D Engineering's investment in Doosan multi-tasking machines means that the company has more than enough machining capability and capacity to cope should its diesel engine customer ramp up its machining requirements. The new machines have also enabled the company to secure profitable work from a range of new and existing customers that more than offset any dip in business from this customer.

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NCMT announces May Open House

The full gamut of machine tools, tooling and ancillary products offered in the UK and Ireland by NCMT under numerous sole agency agreements, mainly with Japanese companies, will be presented at an open house to be held at the company's Midlands showroom and technical centre on 13th and 14th May 2015. Additionally, on 15th May there will be an open day for apprentices and students.

The location will be Siskin Drive, Middlemarch, Coventry CV3 4FJ. Anyone interested in attending should telephone Samantha Andon on 0208 398 4277, email samanthaandon@ncmt.co.uk or reply directly from the NCMT website.

Some of the most advanced technology available to manufacturers will be on display at the open house. From Okuma, there will be seven lathes and machining centres including 5-axis models covering a wide range of sizes. New software will include the OSP Suite user interface, launched at the last JIMTOF show in Tokyo, for Okuma's proprietary CNC system.

Demonstrated also will be the company's novel TurnCut software for generating rotational features on an Okuma machining centre with a static turning tool by interpolating the X and Y axes. Machining Navi software for avoiding chatter, 3D Virtual Monitor for accurate machining simulations and 5-Axis Auto Tuning will feature as well.

From Makino, another of NCMT's Japanese principals, there will be two machining centres, one with 5-axis capability, and an iGrinder G5 purpose-built for VIPER creep-feed grinding of predominantly nickel alloys. Two sizes of iGrinder are used worldwide for producing blades, vanes and blisks for aero engines

and land turbines. Makino's highly capable T-Series of 5-axis machining centres for cutting titanium and the 5-axis MAG-Series, ideal for machining medium to large aluminium airframe components, will be represented by a range of typical machined components, with detailed cutting data.

NCMT's other Japanese machine tool principal is CNC grinding machine manufacturer, Okamoto. The firm's new and first-ever universal, vertical-spindle internal grinder, UGM5V, launched at last year's IMTS show in Chicago, will appear for the first time in the UK at the Coventry open house. It is especially suited to aerospace and gear manufacturing applications.

Tooling will be well represented in the form of the latest Japanese tool holding and cutting tool products from BIG Daishowa and Xebec deburring brushes and mounted points. Italian-built Speroni tool presetters will also be demonstrated.

Workholding is another area of activity for NCMT, which for several years has marketed US-made Techni-Grip products. The patented, highly repeatable clamping system is based on a pin-and-hole design for consistent, positive location combined with a dovetail cut for gripping strength. The holes and dovetail are machined into each billet in a rapid preparatory cycle before clamping.

In a new venture, NCMT will introduce and demonstrate an innovative adhesive workholding system, recently developed in the US by Blue Photon. It is ideal for securing delicate and complex components, including those made from the latest aerospace materials like CMC (ceramic matrix composites) and titanium alumide, while affording excellent all-round access for machining. The process involves application of glue that is cured using ultraviolet light. Removal afterwards simply involves hot water and no witness mark is visible where the glue was applied.

Partner suppliers involved at the open house will include control system company, Fanuc; metrology specialist, Hexagon; CADCAM software developer and supplier, Delcam; and tooling firm, Kennametal Stellram.

On 15th May, NCMT is inviting first-year apprentices from Coventry-based Midland Group Training Services (MGTS) as well as interested students from local schools to see the latest technology that was presented to manufacturing industry during the previous two days. The initiative will hopefully encourage young people to consider a career in engineering and even take their studies on to degree level. Under a scheme started in 2012, supported by Lyn Gray, widow of the founder of NCMT, Gerry Gray, the company has three apprentices and will take on another later this year with the assistance of funding from the Thomas Gerald Gray Charitable Trust.

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Cost-effective solution

The Haas UMC-750 universal machining centre is a cost-effective solution providing both 3+2 machining and simultaneous 5-axis machining.

The UMC-750 is a versatile 5-axis 40-taper vertical machining centre with 762 x 508 x 508 mm travels and an integrated dual-axis trunnion table. The machine is equipped with an 8,100 rpm or optional 12,000 rpm inline direct-drive spindle, and comes standard with a 40+1 tool side-mount tool changer.

The UMC-750's dual-axis trunnion table positions parts to nearly any angle for 5-sided (3+2) machining, or provides full simultaneous 5-axis motion for contouring and complex machining. The trunnion provides +35 and -110 degrees of tilt and 360 degrees of rotation for excellent tool clearance and large part capacity, and the 630 x 500 mm table features standard T-slots and a precision pilot bore for fixturing versatility.

The UMC 750's 8,100 rpm inline direct-drive spindle is powered by a 22,4 kW vector drive system. The Haas inline system couples

the spindle directly to the motor to reduce heat, increase power transmission, and provide excellent surface finishes. For shops wanting higher spindle speeds, an optional 12,000 rpm inline direct-drive spindle is available. Both spindles yield 122 Nm of cutting torque.

For the UK, the Haas Wireless Intuitive Probing System is fitted as standard, along with dynamic work offsets and tool centre point control. Dynamic work offsets allow users to position the work offset anywhere on their part relative to the intersection of the rotary axes. This makes it easier for users to setup the part on their machine as the work offset would be setup relative to a part feature rather than being located at the intersection of the two rotary axes.

A wide selection of high-productivity options is available for the UMC-750, including a belt-type chip conveyor, high-pressure through-spindle coolant systems, high-speed machining control software, expanded program memory, and much more.

Haas Automation designs and builds a full range of metal-cutting machine tools including CNC machining centres, lathes and rotary tables. Haas claims that their machine tools and rotary products are built to deliver higher accuracy, repeatability and durability than any other machine tools on the market.

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Toshiba leads the way with new heavy duty horizontal borer

Heavy manufacturing has now taken a step to being more productive with the arrival of the new Toshiba BTH-130.R24 horizontal boring centre from Leader CNC. This colossal machine tool has been developed to provide large scale manufacturers with exceptional horizontal boring capability, together with the productivity and flexibility achieved from a machining centre.

Within its relatively compact 7 m by 7 m footprint, the Toshiba BTH-130.R24 provides a working envelope of 3 m by 2.3 m by 1.5 m in the X, Y and Z-axes, with the W-axis quill extension of 700 mm providing extra reach. This spacious work area is built around one of the most robust and rigid machining platforms available, something that will deliver incomparable machining performance for manufacturers in the aerospace, oil and gas, power generation and transport industry sectors. Furthermore, the BTH has step-type column guideways that withstand the cutting forces to assure machining performance with virtually no thermal displacement.

Whilst the rigidity and robustness of the 45,000 kg machine is the envy of the industry, the design of the spindle demonstrates equally impressive performance characteristics. The BTH-130.R24 has oversized, widely spaced spindle bearings to absorb high loads and the entire unit is nitrided, hardened and precision ground to ensure precision over the life of the machine. The spindle is contained within an oil jacket that provides constant oil mist to further minimise thermal displacement and guarantee high precision machining. An automatically actuated end clamp helps to support deep hole boring operations.

Driving this technologically ground-breaking spindle configuration is a 45 kW motor with a three step (low, middle and high speed) drive system that provides a wide speed range whilst also providing maximum torque. Toshiba offers the machine with several options, including a long nosed spindle with a 700 mm extension and spindle direction (C-axis) control for single point spring necked turning for oil grooves.

As with any machine in this bracket, the tool capacity is a crucial factor. In this department, the BTH-130.R24 provides an automatic tool changer with an option of 38, 60, 90 or 120 stations. The maximum tool length is 400 mm with a tool weight of 25 kg and a diameter up to 240 mm. The spindle taper is a face/taper contact BBT50.

From a flexibility standpoint, the BTH-130.R24 reduces component setup times through its standard B-axis table. Driven by a servo motor, the B-axis table introduces a revolutionary new clamping system that works in harmony with a rigid double pinion-type drive and rotary scale system that stabilises precision indexing. With a workpiece capacity of 20,000 kg, the innovative new B-axis drive system can index from 0 to 90° in 15 seconds with an indexing repeatability of +/-1.5°. In addition, Leader CNC can offer the new BTH-130.R24 with an optional NC rotary milling feature, which permits continuous control of the B-axis for the machining of cylindrical parts.

For the end user, this combination of features provides maximum material removal, high feed rates and a rigid platform that delivers productivity benefits through tool life savings, superior surface finishes and precision levels that are often beyond those of alternate machines in this size bracket.

As the driving force behind the flexible new machine, Toshiba's latest TOSNUC999 CNC control, using standard ISO programming, gives the end user the option of easily switching between manual, MDI and fully automatic machining modes. The control provides a number of unique features including a multi-window display for simultaneous visual control of two different programs and offset data, a multi-editing function for creating new programs by referring to previous programs and also the ability to customise keys on the control unit for repetitive operations.

Leader CNC Technologies is a well-established company with over 150 years of combined experience and expertise that extends beyond their seven principals encompassing many other manufacturers. The company also enjoys full ISO 9001/2008 accreditation.

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Hurco expands large machining centre range

Having introduced a pair of twin-column, bridge-type, vertical-spindle machining centres in 2009, Hurco Europe has now added a third, much larger model, the DCX42i. The 51 tonne machine has a 4.2 m X-axis travel, plus 2.6 m in Y- and 1.1 m in Z-, providing a working volume nearly double that of the next model down, the DCX32i, and more than four times that of the DCX 22i.

A major advantage of the design over a traditional C-frame is that a much larger Y-axis travel can be achieved without the loss of rigidity. It also offers superior thermal stability for higher accuracy machining and allows heavier table loads, so large components can be produced to tight tolerances.

A single component of up to 16 tonnes can be carried on the table of the DCX 42i. The massive cast-iron structure was designed using finite element analysis, ensuring that there is sufficient weight and strength to take the heaviest of cuts.

The 60 kW spindle, mounted in a vertical ram of box-construction, can be supplied with a maximum speed of either 6,000 or 10,000 rpm. It is oil / air cooled and can deliver up to 570 Nm of torque. The tool magazine has 40 stations for BT50 tool holders and a swing-arm tool changer that keeps the carousel clear of swarf and maximises the working envelope.

All DCX machines are fitted with the Hurco WinMax twin-screen control. Standard features include simple conversational programming, full industry standard NC capabilities and a 64 GB hard drive. Ultimotion high-speed profiling software reduces cycle times by up to 30 percent.

Compact machines deliver substantial power

For most UK workshops, space is at a premium. With this in mind, Hurco Europe showcased a VM10i CNC vertical machining centre and a TM6i CNC lathe at this year's Southern Manufacturing Exhibition. The two machines represent the most compact of Hurco's offerings.

Both machines are fitted as standard with the Hurco WinMax single-screen control that offers simple conversational programming and comprehensive, industry standard NC capabilities. Maximum flexibility for any job that may arrive is provided, ideal for small volume or one-off production. Touch-screen, colour graphics and a 64 GB hard-drive are standard.

The VM10i offers a working volume of 660 x 406 X 508 mm, which is large considering the compact 1.8 m x 1.75 m footprint. A 20-station swing-arm toolchanger and 24 m/min rapids help to minimise non-cutting time, while a 762 mm x 406 mm table with a maximum weight capacity of 340 kg and a 11 kW / 73.6 Nm spindle create a package that delivers full machining centre performance.

Likewise, the TM6i slant-bed turning centre has a tiny footprint

for its specification, which includes a 6-inch chuck and a maximum cutting diameter of 316 mm. Distance between centres is 403 mm. The machine is ideally sized for even the smallest of shops and is well suited to bar work up to 42 mm diameter. The single-piece bed casting provides excellent control of cutting forces. Chip management is included in the competitive price, as is a 3-jaw chuck and Renishaw probe.

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Tornos improves flexibility for Irish subcontractor

As a longstanding Tornos customer, Mann Engineering is only too familiar with the benefits that arrive from investing in technology from the Swiss machine tool builder. Having purchased a Tornos Deco sliding head turning centre over ten years ago, the Wexford subcontractor has just invested in another two machines to meet the changing needs of the marketplace. The Irish manufacturer bought its first Tornos Deco 2000 to replace no fewer than 4 CAM Auto machines whilst reducing secondary operations. At the time, the savings from the sub spindle and driven tooling on the Deco cut some cycle times from over 2.5 minutes to less than 30 seconds. And that doesn't even touch on the floor-space, labour, lead-time and power consumption savings.

A decade down the line and a global recession later and Mann Engineering has seen significant changes to the manufacturing landscape in Ireland. Customers are no longer ordering large batches. A New Ross business in County Wexford had to respond. As company director, Rolf Fuhrmann explains: "Our regular batch sizes have fallen from 5,000 – 30,000 off to anything from 200 to 5,000, so we needed to review the feasibility of our machine tools. Nothing would match the Deco for its productivity, precision and quality levels, but for small batch runs in the region of 200, the setup times prevented it from being a feasible option. We just couldn't compete on cost when we took setup times into account."

Upon reviewing the marketplace and taking its existing plant list of four twin spindle triple turret Japanese turning centres into account; Mann realised it needed flexibility and productivity for parts below 38 mm diameter. This is because its

larger twin spindle machines would support the turning of parts up to 64 mm diameter. The answer was a Tornos ST26 and a Delta 38 turning centre.

The two new additions that arrived in August and September were acquired to replace the ageing Deco machine, increase capacity and also relieve the workload on the larger twin spindle multi-axis centres. The results have been impressive.

Rolf Fuhrmann says: "We turn our parts around for customers within a week and sometimes within 24 hours, so the critical factor in machine selection was service and support. Tornos are fully supported in Ireland by Premier Machine Tools and their excellent support over the last decade was a contributing factor in our decision process. After that, the key element was flexibility; and both machines offered this in abundance."

With a machine shop filled with a variety of Fanuc machines, the Fanuc 31i control on the new Tornos additions reduced the learning curve and created the simple transition of programs from alternate machines. As soon as the Delta 38 and ST26 were up and running, the benefits were staggering. Setup times were instantly slashed by over 70 percent, which instantly made Mann Engineering competitive on smaller batch runs.

The productivity of the new machines over the Deco and the existing twin-spindle machines has been attributed to a number of factors. Firstly, the new Tornos machines are fitted with integrated motor spindles and pneumatically activated clamping mechanism, which significantly cuts the time required for workpiece clamping and feeding bar from the Robobar SBF 326 barfeeding when compared to alternate hydraulic systems. Additionally, the kinematics of the Delta 38 and ST26 plus the modular tooling arrangements have further attributed to flexibility and cycle time savings.

These reductions are also accomplished on the ST26 where a hydraulic ram port component at Mann Engineering was cut on the larger machine in 50 seconds and then transferred to the ST26 to achieve a cycle time of less than 40 seconds. For a part that required internal and external turning, internal screw cutting and machining from both ends, the cycle time reflects the saving from the machine kinematics and tool configurations alone.

Geared for the future

With a healthy order book, a bulging customer base and annual growth in the region of 10 percent, the new Tornos machines will ensure that Mann Engineering can adapt to the marketplace, whatever it has in store. As Rolf Fuhrmann concludes: "We are absolutely delighted with the new machines, their performance and also the service we receive from both Tornos and Premier Machine Tools."

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One metre X-axis for 30-taper machining centre

Brother has launched a new model in its Speedio range of nimble, low-inertia machining centres that distinguishes itself by having an X-axis travel of 1,000 mm. The 30-taper machine made its world debut at JIMTOF 2014, the 27th Japan International Machine Tool Fair held in Tokyo from 30th October to 4th November.

Designated S1000X1, it has been developed to appeal to automotive component manufacturers and others that need to machine larger components. Alternatively, a greater number of smaller components can be fixtured for processing in one cycle, reducing the overall number of tool changes per batch and increasing production efficiency.

Smaller models in the Speedio range have 300, 500 or 700 mm movements in X and 400 mm in Y, but in the latest machine, the Y-axis is increased to 500 mm. All have a 300 mm Z-axis travel.

As their name implies, these machines are quick. Rapid traverse in X and Y is 50 m/min and even faster in Z at 56 m/min. Cutting feed in all axes is 3 m/min. Tool-to-tool change is under one second, giving a chip-to-chip time of 1.4 seconds. Tool change is performed at the same time as X and Y axis movements and rotation of the indexer (if fitted) to reduce idle time. Rigid tapping is performed at 6,000 rpm.

The specification includes a maximum table load of 400 kg, a 10,000 rpm spindle with high-torque and 16,000 rpm options, and 14 tool stations (optionally 21) in the turret. The BIG-PLUS face-and-taper interface may be specified, as well as through-spindle coolant. Air blast cleaning of the tool in the spindle ensures that the point of cutting remains unobstructed. For efficient swarf management to cope with the enlarged machining area, flood coolant delivery rate has been doubled and new telescopic covers have been fitted.

The 3.3 tonne machine sits in a nominal 2.4 metre square on the shop floor. Energy saving measures in the design, including LED lighting and power regeneration from the high efficiency motors, have reduced power consumption by as much as 80 percent compared with the manufacturer's earlier machining centres. A new control, CNC C00, provides faster processing, more functions and higher accuracy machining, especially in 3D.

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New document reflects extensive research

Industry confirms standards for the protection from machine tool fires

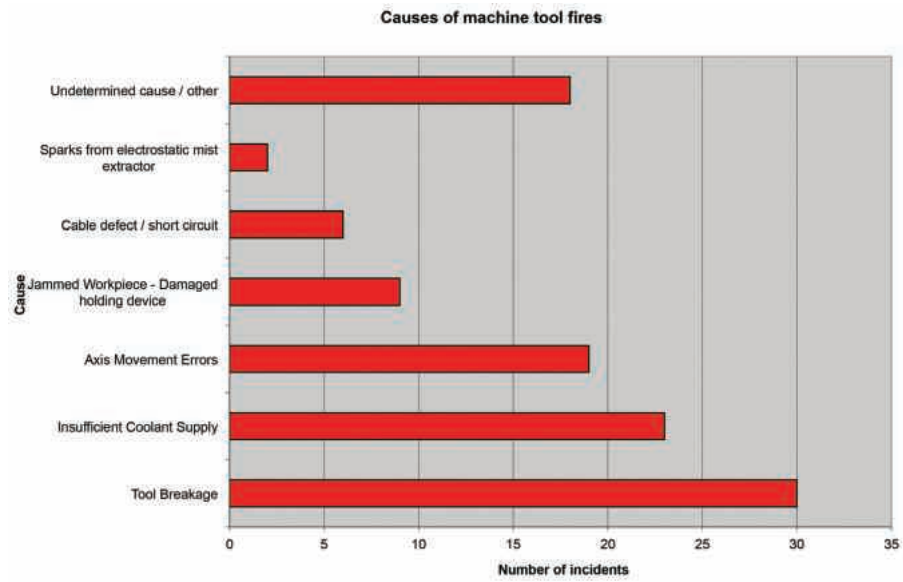
The German machine tool industry, in association with engineering companies, universities and suppliers, has, after months of research, released a new industry standard information document entitled "Machine Tool Fire and Explosion – Prevention and Protection."

Participants in the programme included Index, Traub, Deckel Maho, Daimler, Fuchs (lubricants) and Kraft & Bauer (fire extinguishing systems), plus the VDW (Association of German machine tool manufacturers) and various government bodies, with the aim of understanding the main causes of machine tool fires, what happens during a fire incident and to formulate best practice for dealing with them.

The report notes that low-viscosity, flammable metalworking fluids ("MWF"), neat oils rather than soluble ones, are increasingly being used to achieve more efficient and economic machining on grinding, milling, turning and EDM machines. The annual usage in Germany alone of neat oils on machine tools is now in excess of 40,000 tons per year. This trend brings the topic of fire and explosion protection and prevention for machine tools to the fore. Depending on the type of machining, reactions of the oil/air mixture may occur in the interior of the machine tool, which if violent and followed by a fire can be the cause of accidents with severe material and fire damage. Besides injuries to persons, the consequences to engineering companies may be high due to losses because of production stoppages right through to insolvency. Many engineering companies think that insurance is sufficient, but don't take into account that it may take many months before factories and machines may be replaced. Their customers might well 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 and efficiently as possible against fire and explosion hazards during the use of machine tools. Both manufacturers of machinery and also users of machine tools have key 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. It is now generally respected that if any machine uses oil, and/or has a capacity to generate a spark, or is machining a potentially combustible material such as titanium or magnesium alloys, then it represents a major fire risk. The machine manufacturer takes this information into account when analysing the risk for the identification and specification of the protection concept for the machine; usually by means of fitting an automatic fire extinguishing system and explosion flap devices. The end user has responsibilities to ensure that the fire protection systems are serviced, usually at least annually, by a responsible validated service technician; usually the fire extinguisher makers own engineers.

So what are the causes of machine tool fires? Within the framework of a study carried out by the VDW, about 150 machine tool fires were investigated and the causes for these fires are shown in the following chart:



Most incidents were 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 (MWF) 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.

In case the machine's encapsulation is insufficiently pressure-resistant, a potential injury hazard exists to persons if housing parts blow-off or flames eject when the MWF mixture is ignited. In such cases, a pressure relief device should be fitted for such pressure peaks with flames and hot combustion gases resulting from the ignition being directed to safe areas (usually upwards and away from where operators may be present).

As machine enclosures often only have low pressure resistances (<< 100 mbar), the response pressure of relief devices fitted to machine tools should be less than 5 mbar. The pressure flap safety devices only opens briefly and shuts back closed. This should prevent the rekindling of flames by the introduction of air as well as avoiding flame propagation. A typical safety flap designed to shut off access for flames and explosions through mist extraction ducts is shown here:

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, from leading manufacturers such as Kraft & Bauer who have pioneered designs specifically for use on machine tools, are generally used. The aim is the extinguishing of any burning metalworking fluids (oil fires). The generally accepted requirements for use of these devices are that if a machine is ran automatically then a fully automatic fire system must be used.

Optical sensors must be kept clean and this is done, for example, by constant air purging. The functions "cable breakage" and "window malfunction" should also be monitored (the optical detector controls itself for vision) and fire detection

equipment must correspond to the state-of-the-art (e.g. DIN EN 12 094-9). For planning and installation, the manufacturer's specifications and the rules of technology should be taken into account besides risk-specific aspects. Special solutions must be specified for each application and their efficiency and reliability must be verified by fire tests and tests of the relevant components and systems by a specialist installer.

Optional items such as devices that constantly monitor a bottles weight (in the case of $C0_2$) or a bottles pressure (in the case of Argon) should be considered as these prevent machine tools from being used with empty bottles.

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 when new, recurrently thereafter in accordance with the suppliers 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.

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. Furthermore a test by independent third parties/experts (also replaces tests by competent persons) is required. 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/machine but for at least four years.

Kraft & Bauer UK supplies major machine tool manufacturers and distributors with fire protection systems and also offers a full retrofit and service support facility for its UK customers from its base in Coventry with the same day availability of all parts being guaranteed. It also offers a same day/next day swap system for discharged $C0_2$ and Argon gas bottles.

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FX3-MOC Drive Monitor promises greater machine safety flexibility

SICK has expanded its Flexi Soft modular safety control system to include the new SICK FX3-MOC Drive Monitor, promising increased flexibility for safe operator intervention through a wide range of drive safety functions to reduce machine downtime and aid productivity.

Supporting all standard encoder and motor feedback interfaces, the new SICK FX3-MOC Drive Monitor is ideal for a wide variety of stationery and mobile machine safety applications, especially for machines that require frequent intervention where maintaining a controlled speed is beneficial to continued safe operation.

For example, the high-performance drive monitoring of the SICK FX3-MOC enables an operator to reach into a machine at reduced risk without having to power off. The Drive Monitor can also be used on Automated Guided Vehicles alongside SICK safety laser scanners to monitor vehicle movements.

"Sick uses the term Motion Control to refer to safety products that monitor the safety of machine movements, based on the principle of safe motion monitoring, rather than deactivation," explains Dr Martin Kidman, SICK UK machinery safety specialist.

"The Drive Monitor reduces time consuming maintenance and setup procedures, as the machine sequence does not have to be completely stopped. In contrast to conventional solutions, protective doors can also open immediately after the Drive Monitor has detected that the machine has stopped and not only after a pre-determined time.

"The Safe Stop 2 function of the Drive Monitor means that if an operator reaches into a monitored hazardous point, the drives are stopped but remain under power. A quick restart is ensured without having the reference the drives again."

As an extension module to the SICK Flexi Soft safety controller, the SICK FX3-MOC Drive Monitor can be configured using SICK's Flexi Soft Designer engineering software, which is freely available to download from the SICK website. Up to six Drive Monitors are possible on a single Flexi Soft main module.

The SICK FX3-MOC monitors many functions in accordance with IEC 61800-5-2 and is open for almost all common automation and controller environments. It is suitable for AC, DC, servo stepper motors and other types of drive. Compatible with a range of common fieldbus comms protocols, it is simple to integrate into a higher level PLC controller in combination with the Flexi Soft safety controller.

The versatile software design used for programming the FX3-MOC also allows the import of predefined applications for simplicity in engineering standard safety solutions.

In total there are seven drive safety functions; two Safe Stops; Safe Operating Stop; Safe Speed Monitor; Safety Limited Speed; Safe Direction and Safe Brake Control. With the Flexi Soft controller, one FX3-MOC can monitor up to 10 speed levels and four brake ramps, as well as multiple axes.

The SICK FX3-MOC is fully integrated with the Flexi Soft system and is supported by the engineering download Flexi Soft Designer which can be found a www.sick.com/drivemonitor

Founded in 1946, the company now has nearly 50 subsidiaries and holdings, as well as numerous sales offices around the world. In the 2013 business year, SICK had more than 6,500 employees worldwide and generated Group revenues of €1,009.5 million.

From factory automation to logistics automation and process automation, SICK is one of the leading sensor manufacturers. As a technology and market leader, SICK provides sensors and application solutions that create the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents, and preventing damage to the environment.

For more information on the SICK FX3-MOC, or any of SICK safety and protective devices, contact:

SICK (UK) Ltd
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Email: info@sick.co.uk
www.sick.co.uk

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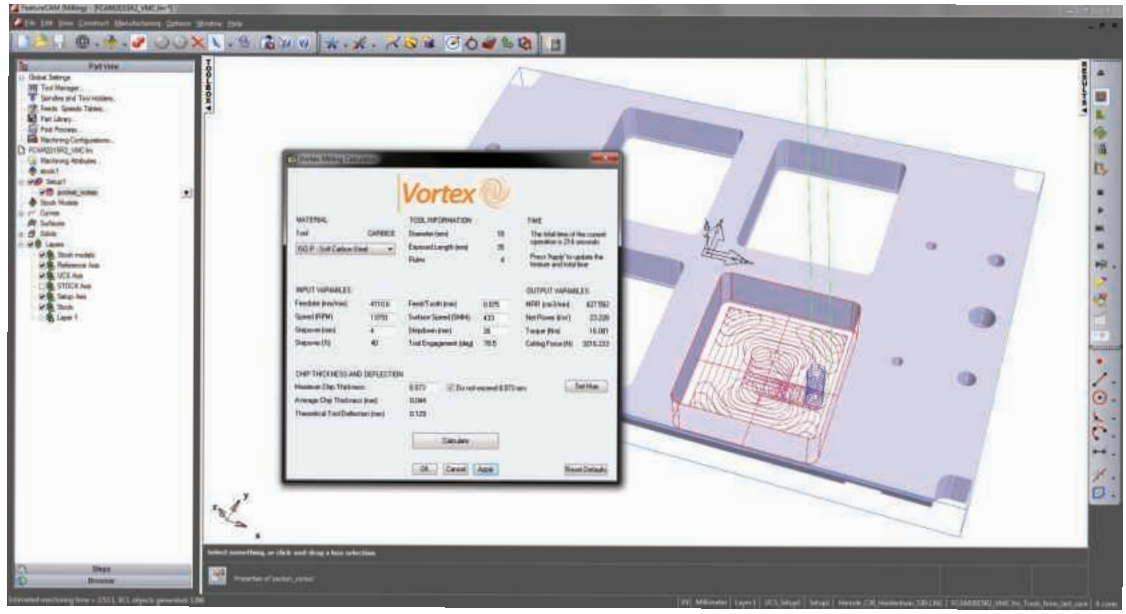
Delcam's enhanced FeatureCAM

The 2015 R2 release of Delcam's FeatureCAM feature-based CAM software incorporates a milling calculator to help users obtain the maximum benefit from the Vortex high efficiency area clearance strategy. Other enhancements, among the 280 customer-requested improvements since the initial release last September, include the ability to create multi-tool blocks within machine designs, better control over toolpath output and more efficient automatic selection of tools.

FeatureCAM was the world's first feature-based programming software when it was launched in 1995. Constant development since then has ensured that the system has retained its leadership in programming speed and ease of use, while an increased range of strategies has been added to provide more efficient toolpaths that give greater productivity on a wider range of machinery, including mill-turn machines, 5-axis mills and wire EDM equipment.



The Vortex area-clearance strategy in FeatureCAM produces safe toolpaths with a much deeper cut by using a controlled engagement angle that maintains the optimum cutting conditions for the whole toolpath. As a result, higher feed rates and material-removal rates are possible, making the cutting time shorter by as much as 70 percent. In addition, cutting is undertaken at a more consistent volume-removal rate and at a near constant feed rate, so extending tool life and protecting the machine.

The radical nature of Vortex can make it difficult for users to set the optimum parameters when they first apply the strategy. To overcome this problem, Delcam has added a calculator that provides an easy way to maximise productivity and efficiency with Vortex. The calculator uses control of the maximum chip thickness to calculate the appropriate feeds and speeds that will minimise the cutting time while maintaining a consistent load on the cutter.

A new development in the Vortex strategy itself will make it more efficient when machining flat areas or open pockets. In both cases, Vortex now allows the cutter to approach from outside the stock rather than having to make a helical entry move into the stock.

Both Vortex and other 2-axis toolpaths have new output options. These give control over point filtering and arc fitting, both of which can contribute to smother machine motion and, therefore, to better surface finish.

In a related development, toolpath points can now be displayed by using the dialog for output options. This allows the user to view the toolpath points and check that their distribution is compatible with the machine-tool controller.

As machines have become more sophisticated, accurate simulation has become increasingly important before toolpaths are passed to the machine. In FeatureCAM 2015 R2, multi-tool blocks can be created within machine-design files. Tool blocks can be developed with a list of tool locations and then the attributes can be specified describing the type of tool to be held in each location. The blocks can then be used in the simulation of the movement of the part being machined towards the various tools.

The programming time for drilling has been reduced significantly in the new release. Specific pecking depths can now be allocated to drills on a tool by tool basis. This change means that there is no longer any need to update the global pecking defaults after the creation of features needing to be drilled.

In addition, the exposed length of all tools is now checked as part of automatic tool selection. The check allows tools to be verified against the depth of the feature or the setup depth so that potential collisions can be avoided.

Delcam UK is a division of Delcam Plc, a world leading developer and supplier of CADCAM software for the three dimensional design, manufacture and inspection of complex shapes. Its products are used in a huge range of applications, from conceptual design to pattern making and tool making for a variety of sectors including the automotive, aerospace, plastics, ceramics, rubber, glass and packaging industries.

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New reliable end milling concept

CoroMill® Plura Heavy Duty (HD) is a completely new solid end milling concept, developed for removing large amounts of metal in a short amount of time and to provide the reliability needed for heavy roughing

CoroMill Plura HD is the first choice solid roughing end mill for shoulder milling, full slot milling, ramping and helical interpolation in steel and stainless steel. It can also be used with cast iron and heat-resistant materials. The tools offer secure and reliable machining in a wide range of cutting parameters.

High process security and a long predictable tool life are essential in heavy roughing operations. The optimised flute shape was especially designed as a result of a Finite Element Analysis, and it assures effective chip evacuation when machining with a large depth of cut. This flute design also prevents re-cutting of chips and sudden tool breakage. By efficiently removing chips, full slot milling up to two times diameter with five-teeth end mills is possible without compromising process security. Stainless steel end mills also benefit from internal coolant for maximum chip evacuation and temperature control.

The geometrical features and grades allow for exceptional metal removal rates and tool life. Two new grades have been developed; one for all-round conditions, preferably in dry machining, and one to deal with tough conditions and large engagements in wet machining. The tough face geometry is developed to cope with demanding ramping operations. Other features include differential pitch and cylindrical land to help minimise vibration and to provide predictable performance for reliable roughing.

Sandvik Coromant is a global leading supplier of cutting tools, tooling solutions and know-how to the metalworking industry. With extensive investments in research and development we create unique innovations and set new productivity standards together with our customers. These include the world's major automotive, aerospace and energy industries. Sandvik Coromant has 8500 employees and is

represented in 130 countries. We are part of the business area Sandvik Machining Solutions within the global industrial group Sandvik.

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WIDIA Victory VSM11 cutter and inserts

Described as an 'all-rounder', Industrial Tooling Corporation (ITC) is now offering the WIDIA Victory high-performance milling cutter for multiple functions such as shoulder milling, slotting, pocket milling, ramping and helical interpolation.

With a wide variety of grades, the latest WIDIA Victory™ milling line can be applied to a variety of workpiece materials. The new VSM11 line provides versatility for a wide range of applications as it has been specifically engineered and optimised to provide higher productivity for job shops. The VSM11 cutter bodies have an integral chip gash design for excellent chip evacuation along with a hardened-steel construction and hardened pocket seats for improved resistance to deformation. These are available in shell, screw on, cylindrical shank and Weldon shank models with internal air and coolant capability.

The VSM11 cutter supports an 11 mm insert that has an optimised cutting edge and positive rake face that provides a true 90° wall while reducing cutting forces and

providing excellent, step-less surface finishes. Six WIDIA Victory grades and five geometries make up a well-rounded portfolio of first-choice recommendations that cover multiple material types and machining tasks.

There are many things for job shops to like about VSM11 that is now available from Tamworth cutting tool specialist ITC. One offering can accomplish 90° shoulder milling, full slotting, 3D pocket milling, circular contour milling ID and OD, helical interpolation and ramping. Added to this, the range reduces cutting forces and improves free-cutting action and the result is phenomenal hours of improved tool life. For any manufacturers interested in the VSM11 line from ITC, the Tamworth manufacturer has an introductory offer that will make it an enticing prospect.

ITC's state-of-the-art production facility includes CNC grinding machines from world leading manufacturers, including Walter, Schneeberger, Deckel, Rollomatic and Anca.

More manufacturing companies than ever before, both in the UK and abroad, are relying on ITC to solve their manufacturing problems.

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Bed-style milling machine is the first to carry latest Heidenhain control in UK

Ajax Machine Tools International has extended its range of heavy duty, solid boxway CBM Interactive bed-style milling machines with the launch of the AJCBM 800, the first UK built machine to feature the latest version of Heidenhain's highly popular TNC 320 control system.

Managing director William Savin says: "Ajax is now the largest installer of Heidenhain control systems on new machines in the UK and is the first to launch a new machine of this type with the latest TNC 320."

The AJCBM 800 retains the original practical and cost-effective concept that made the Semco Mastermill 800, still being sought by customers even after more than a decade, when it recorded several hundred installations by Ajax. Like the Semco machine, the new AJCBM 800 has an increased cross axis (Y) of 500 mm to create overall working strokes of 800 mm by 500 mm by 500 mm and the added benefit of the new control for less than £ 30,000.

Included in the upgraded features of the TNC 320 is a more modern appearance and user interface with high resolution 3-D graphics that significantly enhances simulation and toolpaths, with either tool or workpiece transparency, accentuation of on-screen edges and tool-orientated colouring of the workpiece. New face milling and trochoidal milling cycles with a soft key activated cutting data calculator for spindle, cutting speed and feed rates, are further benefits. Also incorporated is improved navigation, plus MOD menus and simplified cycle selection using conversational guidance.

Featuring hardened and ground solid boxways on a heavy cast iron ribbed bed, the advantage of the variable speed 5.5 kW, 40 to 4,000 revs/min turret-style head bridges the gap between a full CNC machining centre and a toolroom milling machine. The head has + /- 90 degree swing either side of centre that further increases the operational flexibility.

As a result, features required on components such as the milling of angled flats or slots as well as precision drilling and tapping at an angle can be easily accomplished on the 1,270 by 320 mm working table surface.

Ajax's AJCBM 800 is the first UK built machine to feature the latest version of Heidenhain's popular TNC 320 control

AJAX ties in machines with Siemens for common CNC control and training package

By utilising the advantage of a common control system for a range of lathes and bedmills and creating a training package around a 12 seat suite for off-line training in programming and simulation based on the same control, Ajax Machine Tools International has been able to create a machining training package based on one each of both machine types for less than £35,000.

William Savin says: "We have worked closely with Siemens using its Sinumerik 808D control system to take advantage of a common presentation for both milling and turning operations that reflect the needs of production, workshops and toolrooms in manufacturing. As a result, we are able to provide a package to enable students to have a greater understanding and appreciation of actual machining processes when they take to future employment."

The educational package machines are based upon an Ajax Interactive CNC 720 bedmill having working strokes of 720 mm by 380 mm by 500 mm with the added flexibility of a turret head having ±90° swivel and Siemens 808D control. Meanwhile, the Ajax AJEU 200 Euroturn electronic CNC lathe has a capacity of 200 mm centre height, a 42 mm bore and 750 mm between centres which uses Siemens 808D control.

The 12 seat off-line Sinumerik 808D on PC training software for workpiece programming and integrated simulation is able to present the features of both Sinumerik 808D control types giving ultra-simple cycle assistance to represent actual machine tool operation. As Ajax builds both machines at its Lymington headquarters, this enables specific options, upgrades and requests to be incorporated into the education package which already includes delivery, installation and on-site training plus a 'starter' tooling pack and workholding.

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Controlled and economic machining of aluminium

PCD milling cutters now include chip breaker

By combining the PCD milling cutters developed and patented by LACH DIAMANT with the PCD chip breaker patented by Audi AG, this process assures and guarantees controlled and economic machining of aluminium.

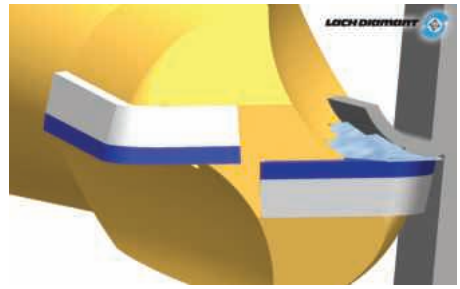
These advantages are now being offered to all aluminium processors, and will be especially useful to those working in the automobile accessory industry.

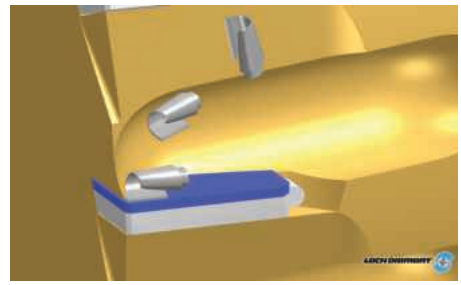
This is now possible after the conclusion of a licensing agreement with the Audi AG, the owner of the patent.

With immediate effect LACH DIAMANT PCD Monoblock milling cutters will be offered not only with the featured ''Cool Injection'' direct cooling through the PCD cutting face, but also alternatively with the ''Plus'' chip breaker.

The ''Cool Injection'' mode of operation and chip breaker ''Plus'' are explained in the following schematic representations.

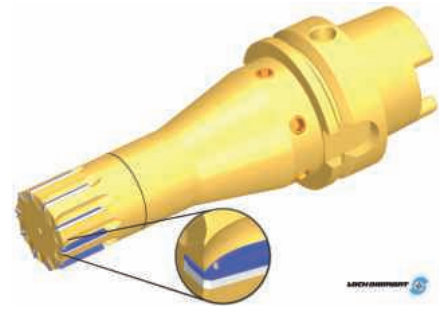
Combining both advantages provides the ideal combination for the innovative ''Cool





Injection-Plus'' machining of aluminium.

With the close pitch, the maximum number of teeth leads to a considerable longer service life, extreme high cutting values, increased infeed, perfect surface quality and component accuracy. With high



performance cutting (HPC) a cycle time reduction of over 50 percent is also possible.

The ''Cool Injection-Plus'' catalogue for HSC/HPC aluminium machining with many up-and-coming PCD milling cutters and working examples can be obtained by visiting **http://tinyurl.com/coolinjectionplus-e**

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Innovative insert geometry

New WSX series low cutting resistance face mill from Mitsubishi Materials

The positive geometry of the Double Z inserts for the new WSX series takes face milling to a new level of usability. The geometry produces low cutting resistance, making it ideal for all types of machines, from low power through to heavy duty types. This level of cutting resistance is only usually associated with conventional single sided positive inserts and allows end users to increase machine utilisation. The new moulded SNMU and SNGU G class type inserts, used on the WSX cutter, have all the attributes of a single sided positive geometry insert but importantly, also have the advantage of being double sided. This ensures a cost saving of eight cutting edges.

The cutting edge of the Double Z geometry inserts are set at a 17° positive axial rake angle when clamped in situ. This provides the perfect solution that includes a strong but sharp cutting edge whilst allowing the inserts to be double sided. Furthermore, a large 5 mm max depth of cut is possible.

Reliability

A predictable and safe performance is demanded by today's customers and the WSX series meets these criteria with strong insert clamping and an Anti-Fly mechanism. Through coolant holes are also standard in cutters under Ø160, providing efficient chip removal and cooling to further enhance process reliability.

Wide application area

The WSX series comes complete with a comprehensive range of insert grades to cover a huge range of material applications, from carbon and alloy steels through to heat resistant materials and hardened steels. The latest TOUGH-∑ technology is used in the new MP range of insert coatings to provide enhanced heat and wear resistance and provide a low coefficient of friction, lending further help towards the ultimate aim of complete process reliability.

The inserts are equipped with a series of chip breakers specifically designed to cover

a varied range of applications. L breaker has a positive land for lighter cutting and the lowest cutting resistance, M breaker is for general cutting and R breaker has enhanced edge strength for unstable cutting.

The cutter bodies are available from Ø40 to Ø200 in coarse, regular and fine pitch types.

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Advanced machining capabilities

Edgecam's 5-axis capability and Waveform advanced machining functionality have been demonstrated at SGS Tool Europe's headquarters and manufacturing facility in Wokingham.

The Edgecam User Group Meeting and 5-axis Workshop also included high performance cutting tool presentations along with machining demonstrations, with live cutting shown on 3-axis and 5-axis DMG machining centres installed in the company's Technical Centre.

A roughing strategy used as a high speed machining technique, Waveform maintains a constant tool cutting load by ensuring the tool engagement into the material is consistent. The tool follows a smooth path to avoid sharp changes in direction which maintains the machine tool's velocity.

While a typical concentric toolpath looks much simpler at first glance, problems occur from the material wrap around or 'digging in' to each corner, causing it to overload and leading to reduced tool life or breakage. In reality the machine tool operator has to reduce the cycle feed rate to compensate, increasing the manufacturing time. As Waveform maintains a constant engagement the feed rate can remain at the optimal value throughout the cycle, this will improve the tool life and greatly reduce the risk of tool breakage.

For pocket regions the tool will helical ramp to depth at the pocket centre, a continuous spiral will generate out until the edge of the pocket is reached, any remaining corners are then removed.

To maintain the tool engagement and chip load the tool path is automatically adjusted by the software. When cutting into a concave area, tool engagement is increased. The cycle adjusts the step over between the passes to compensate and maintain the desired engagement. When cutting a convex area the opposite effect occurs. As the material falls away the tool path step over is increased to maintain the desired engagement..

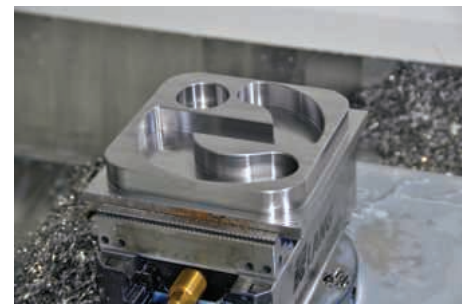
Barry Ward, SGS technical manager, explained that while Waveform toolpaths could be applied to most SGS high performance cutting tools, there were crucial points to be considered that would help make the ideal tool selection. These include raw material, type and power of the machine tool, work-holding rigidity, tool-holding quality, tool protrusion, internal corner radii, chip evacuation and coolant supply.

His presentation encompassed established SGS products, such as the Z-Carb AP and V-Carb as well as more recently developed products. These included the Series 51 T-Carb that has been specifically designed for trochoidal toolpaths; Series 66 Multi-Carb, that has been designed for stability with high feed finishing capabilities, featuring an increased number of flutes: Series 33 that are specifically designed for aggressive ramping, pocketing and slotting of stainless steel, as well as titanium and Inconel.

What the guests said:

Triumph Actuation Systems' facility on the Isle of Man has three Edgecam seats complete with the software's 5-axis machining module to support its Mazak multi-axis machine tools. Karl Sharp, NPI manager (New Product Introduction), says: "We use Edgecam to support production and we use a lot of SGS solid carbide tools, so it is great to see the two companies working together. The presentations have given us a few ideas, combining the high performance tooling with Waveform techniques."

The company always re-evaluates its manufacturing operations, and has previously seen benefits from the application of SGS tools with high efficiency NC toolpaths created in Edgecam. "We have already made savings of around 10 percent on our longer machining cycle times," explains Karl Sharp. "We have touched on Waveform's capability in the past, but never really dived in. Now we have the impetus to reduced cycle times and increase tool life."



Mike Simmonds has been senior production engineer at Hewland Engineering for the past two and a half years. The motorsport transmission specialist is a long-term Edgecam user and sees the software as being at the core of its business. "We currently have seven seats but customer demand means we are looking to increase to 10, with additional 5-axis machining modules and on-machine probing.

"As well as seeing how Edgecam is being developed, events such as this provide us with the opportunity to get out of the rut. In the motorsport industry we need to find things that are more productive and we are always looking to progress; looking outside of the envelope wherever we can."

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MAPAL tool management makes life easier for CastAlum

Concerns over the availability, performance and cost of tooling for its high-performance machining centres are a thing of the past for internationally acclaimed automotive component supplier, CastAlum, following the company's adoption of tool management systems operated by MAPAL, a world leader in precision tooling solutions.

Under the terms of its tool management agreement with MAPAL, CastAlum simply pays an agreed fee for every component it produces using the company's tools. MAPAL then controls all aspects of tooling, including the supply of replacements for worn tools, on-site services such as tool setting, training and the implementation of a continuous improvement programme to enhance CastAlum's productivity and to drive down costs.

CastAlum has, in fact, been using MAPAL's tool management service very successfully for several years to support the volume production of gearbox housings. Recently, however, the company secured another high volume contract from a major automobile manufacturer, this time to supply four variants of a steering housing, all of which require much more complex machining than the gearbox housings.

Although CastAlum would have preferred to adopt the same tool management system for the new products from the outset, this was not possible for two reasons. The first is that Heller, the manufacturer of the new machining centres purchased for the project, supplied the initial tooling as part of a turnkey package with Mapal as partner. The second was the need to establish experience of working with many complex variants of components before the price per component charged for the tool management service could be realistically set.

However, after the production of the new components was bedded in, CastAlum worked closely with MAPAL to extend the existing tool management programme to cover them. This involved MAPAL taking on responsibility for all of the tools used, including consumables like drills and reamers, custom tools of its own manufacture and even custom tools supplied by third parties.

In return for its fixed fee per component produced, which was negotiated and agreed with CastAlum, MAPAL guarantees that CastAlum will always have to hand the tools it needs to ensure that production is not interrupted, and that all of the tools in use have been correctly set and are in good condition. A planned life is also determined for each tool and the tool is automatically replaced or refurbished, irrespective of its apparent condition, when this life is reached.

To provide this technical service support, a skilled MAPAL engineer works at CastAlum's site, at no extra cost to the company, for two full days every week. While on site, the engineer checks stock levels and the condition of tools as well as collating data on life-expired tools and

delivering replacements. He also presets tools held in stock so that they are ready for immediate use on the machining centres when required, and maintains detailed records of tooling performance.

The system uses ID tags (electronic chips) fitted to all major tools, which hold critical details of the tool, and automatically log its usage and remaining life. The engineer can read the data from the ID tags manually to determine tool identity and status, and it is read automatically whenever a tool is mounted in a machining centre, thus ensuring that the correct tool is fitted and that it is in a serviceable condition.

Another aspect of the on-site engineer's work is to hold weekly meetings with the CastAlum production team to discuss any issues relating to tooling. This includes analysis of tool breakages and damage, which are, in practice, very rare occurrences. While MAPAL covers the cost of tools damaged because of factors within its scope of influence, such as incorrect setting, CastAlum is responsible for the costs associated with other types of damage.

The meeting also produces a weekly continuous improvement report that details suggestions and actions for improving productivity, tool performance and tool life. These reports have, for example, led to standardisation of the specified lives for similar tools used in different applications, which has helped to enhance tool utilisation.

Improvements are frequently suggested and made, not least because payment per part gives both parties a strong incentive to enhance performance as, if productivity is increased, CastAlum makes more parts and MAPAL gets a corresponding benefit.

"Machining the steering housings is a complex task, and it's very useful for us to know that tooling is one aspect of the work that we don't have to worry about," says Chris Dodds, programme manager at CastAlum. "Being able to rely 100 percent on having the tools we need when we need them takes a lot of pressure off us, and it's worth reporting that, since we started the tool management programme with MAPAL, we haven't had a single stoppage on the steering housing production line that has been down to the tooling."

The flexibility that the tooling management gives CastAlum is another major benefit, as was illustrated recently when the company's customer significantly ramped up the demand for steering housings. This meant that CastAlum had to switch extra machining centres to steering housing production, which increased the number of tools needed. Because of the resilience built into its systems, MAPAL was able to respond immediately, and the increased level of production was supported without problems.

"Not only does the MAPAL tool management service save us huge amount of time and effort," says Chris Dodds, "we've even found that the on-site engineer sometimes spots problems before we're aware of them, allowing us to put things right without losing production. We also very much like the fixed per-component costs, as this makes it so much easier for us to cost our products.

"In short," he continues, "we find MAPAL to be a great partner in every respect. The company has outstanding expertise, it is hugely supportive, it offers very competitive pricing and, if ever we do need extra help on any aspect of tooling, there is always someone at the end of the phone to provide it."

MAPAL Ltd
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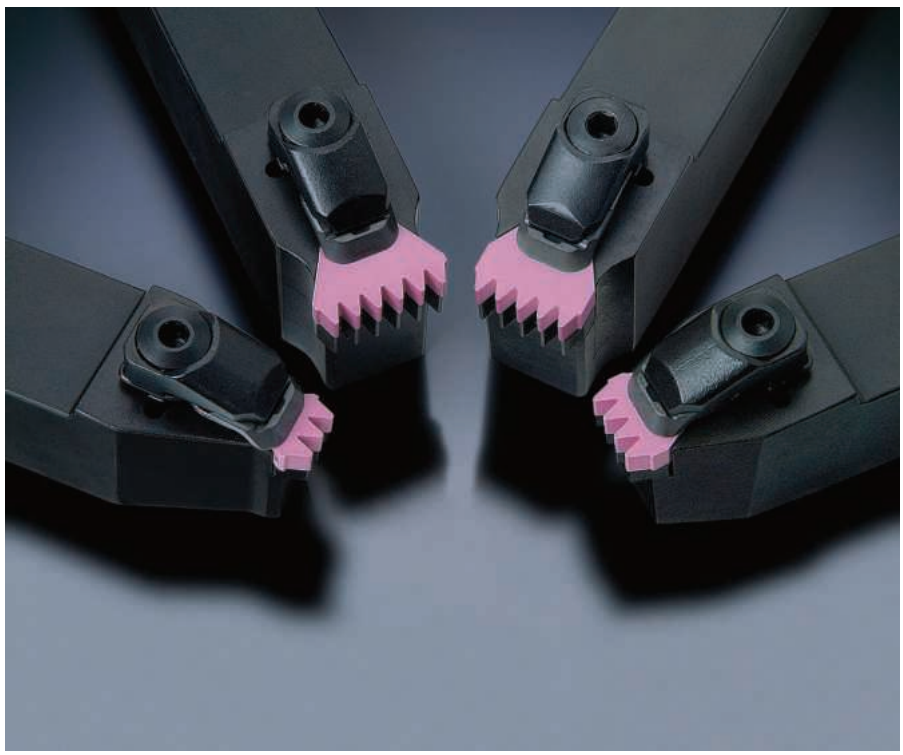
NTK demonstrates pulling power with POLY-V Line

For the groove machining of cast iron pulleys, NTK has now introduced its innovative line of POLY-V grooving tools. By developing grooving inserts in its renowned HW2 insert grade, NTK is offering a solution that can reduce machining times, improve productivity and tool life.

The new line from NTK is available with insert geometries that provide 3, 4, 5 and 6 grooves respectively to suit the dimensions of the desired pulley. To enhance the strength of these insert geometries, the tooling line is supported with K3-C, K4-C, K5-C and K6-C designated shims that underpin and support the inserts. To further extend the tool life and performance, the inserts are particularly thick at 4.76 mm. The shape of the new POLY-V inserts include either a 0.3, 0.4 or 0.5 mm edge radius with a standard pitch offering of 3.56 mm with a groove depth of 3.35 mm. These dimensions have been selected to conform to the industry standard forms for pulleys. However, NTK can manufacture specific geometries to suit the needs of the end user.

The new POLY-V line provides machining parameters beyond alternate products with a recommended cutting speed in the region of 300 to 600 m/min and a feed rate from 0.05 to 0.15 mm/tooth that depends upon the performance parameters of the customer machine tool. This exceptional cutting rate on cast iron is enhanced by the supporting toolholder that is particularly robust and rigid. The POLY-V is supported by a choice of toolholders that have square shanks with a height of 25 or 32 mm and a width of 25 mm that enhances the insert clamping, vibration damping, surface finishes and rigidity characteristics of the tooling. The toolholders are provided with either a 150 or 170 mm overall length.



For fast insert changeovers and to minimise non-cutting times , the POLY-V line includes a thrust plate, clamp, shim and shim-screw that efficiently and rapidly clamps the insert with extreme force to guarantee impeccable surface finishes on the pulley.

NTK Cutting Tools
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Unprecedented high-quality process reliability

Walter GB sets a new performance standard with the DC170 carbide drill

The new DC170 carbide drill just announced by leading tooling manufacturer Walter GB features an unmistakable new land design and coolant channel structure to offer unprecedented levels of high-quality process reliability and longer tool life than carbide drills with traditional geometries.

Initially available in diameters of 3 to 16 mm for depths up to 16 and 20 times diameter, the new drills are designed for hole generation in ISO P and K materials and are particularly suited for difficult operations inclusive of cross holes and inclined exits.

With through-the-tool-coolant, the DC170's eight channels formed by the new land design allow for good coolant flow and unimpeded chip clearance and, while the new alignment of the lands enables coolant to continuously surround the drill and so effectively cool the drill, vibration is also minimised to thus create high-quality holes.

The drills can be reground up to three times within DIN standards, thus maximising their cost-to-production benefits.

Up to 40 percent longer thread mill life

The new Walter Supreme Prototyp TC610/TC611 thread mills from Walter GB offer tool life increases of up to 40 percent compared to competing tools.

Both thread mills have TiALN/TiALN plus ZrN (zirconium nitride) coatings and both are available in two grades: the highly wear-resistant WB10RD (gold coloured surface) and the tougher WJ30RC (black surface) for less stable machining conditions. Both can be used on materials from the ISO P, M, K, N and S groups.

TC610 is for thread depths up to 1.5 times diameter while TC611 is for up to twice times diameter.

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www.walter-tools.com

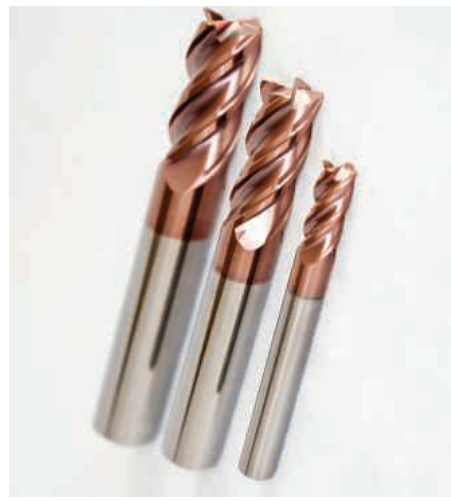
Mirage results are no illusion

It may be named Mirage, but the 50 percent saving in cutting cycle times for titanium 6Al-4V achieved using this high-quality Quickgrind carbide tool is very real.

As customers dealing with a variety of challenging materials have discovered, solid improvements and leaner manufacturing processes are possible when Quickgrind's tools are combined with the company's tooling performance consultancy service.

Managing director Ross Howell explains: "Our products are internationally renowned, but we do much more for our customers than sell them great tools. With our team's technical knowledge, applications expertise and understanding of the very latest machining strategies, we can look at problems from every angle, identify or create the perfect tool for the job and advise on how to use it in the most profitable way."

Titanium 6Al-4V is typically found in high-tech industries such as aerospace and Formula 1, where it has a reputation for being difficult to cut. Under intense competition from overseas, British manufacturers in these sectors are always looking for new efficiencies that will keep them ahead of the field, so the figures from Quickgrind will come as welcome news.



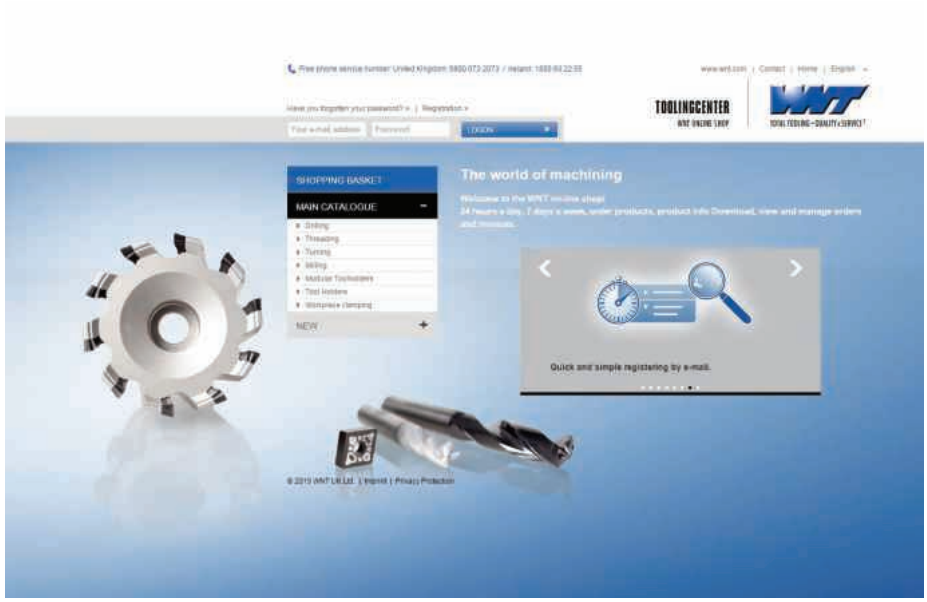
In tests, titanium 6Al-4V was machined using a Quickgrind 4 flute 12 mm diameter Mirage tool, at a cutting speed of 180 m/min and with a feed rate of 2,200 mm/min. The hardwearing tool maintained its performance through as much as 450 minutes of contact time. Mirage tools have also regularly proved their superiority on materials including Inconel, Hastelloy and 'S' specification, as well as high-grade stainless steels.

Ross Howell continues: "Quickgrind offers a 'total solution engineering' approach combining a comprehensive tool range, specialist advice, the latest machining techniques and unique solutions for remanufacturing and tool management. To find out how we can give your business a unique cutting edge and make higher profits a reality, come and meet us at the Manufacturing UK 2015 event at Yamazaki Mazak in Worcester on 23rd April."

For more information on Quickgrind and its total solution engineering, contact:

Quickgrind Ltd
Tel: 01684 294090
Email: sales@quickgrind.com
www.quickgrind.com

WNT loyalty programme rewards online customers



WNT's recently unveiled Bonus Point Programme is aimed at rewarding existing online customers and encouraging others to make use of the WNT Online Shop. Once registered, customers can start to collect Bonus Points that can be redeemed against future cutting tool orders.

The WNT Bonus Point Programme is structured to give customers 10 points for every £150 (net) order placed, with one additional point for every £15 spent over that minimum order quantity. These points can then be used to offset the cost of future orders on a wide range of WNT products included in the programme, with earned points being valid for six months.

Registration for the scheme is straightforward and can be completed online at **www.wnt.com** or by telephoning 0800 073 2073. Once registered they will have access to the entire WNT online catalogue and receive the same level of guaranteed delivery, but with the benefit of being able to order tooling 24/7 and gaining the benefit of free tools as a member of the Bonus Point Programme. Example redemption values for the WNT Bonus Points are 84 points to get a free 26 mm parting blade, or 380 points for a 50mm diameter facemill body.

"The WNT Online Shop is the most efficient way in which customers can place orders, especially for those customers that know what they want or, are regularly buying the same products," says Tony Pennington, managing director, WNT (UK).

The customer's purchase history, both online and offline, is available to view at any time, with the ability to repeat full or part orders 24/7. The WNT Online Shop also gives users access to real time stock levels, current order status, technical information and sales documents in real time, with customers able to authorise any number of employees to make purchases online, so responsibility doesn't fall on one person's shoulders, who may not always be present.

WNT will continue to provide its industry-leading technical and sales office support, and this is an area that we are expanding on in 2015. The WNT Online Shop provides another level of customer service to those businesses that prefer or, need access online 24/7.

The 22-page Bonus Point Programme highlighting all of the tools and toolholders that are included in the scheme can be downloaded at **http://goo.gl/wim78Z**

WNT invests to make carbide greener

WNT (UK) has announced a group wide recycling service to customers using carbide tooling. The group had made a major investment at its group manufacturing facility in Reutte, Austria, to allow recycling of carbide that was left over in the manufacturing process. However, the capacity for recycling that this facility has created means that WNT can now offer this service to its customers.

In a similar process to WNT's existing carbide drill regrinding service, any customer wishing to recycle old carbide can contact WNT (UK) on 0800 073 2073. You

will be supplied with a green recycling box which, when full, will be collected and sent back for recycling. The customer will then have credit added to their account based on a fixed price per kilo of scrap carbide, this can then be used to purchase new tools from WNT's extensive range.

"We all know we should recycle, but it is often seen as a chore," says Tony Pennington. "We have therefore designed this recycling initiative with simplicity and efficiency in mind. All the customer has to do is e-mail or telephone our office in Sheffield and we will organise everything else from delivery of the recycling box and its collection when full. Our customers will benefit from a seamless system of recycling old carbide and also financially as by recycling they will be reducing there consumable tooling costs," he concludes.

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New precision internal and external machining system

UK & Ireland nationwide tooling supplier Cutwel has announced that it is a new agent for Simtek, a leading German manufacturer of high precision internal and external machining systems. The acquisition of this new supplier is a real coup for Cutwel. It felt that it needed to fill a gap in its range and this certainly fits the bill.

With more than 12,700 tools available, Simtek manufactures tools to cover almost any application such as grooving, threading, boring, turning, milling and also offers a quick turnaround on special requests. The Simturn range offers various tooling systems for internal and external applications. Each range has been structured and optimised for particular bore diameters, such as the AX (Alpha Line) system for internal small part machining in bores as low as 0.3 mm up to 10 mm and the EX system for larger bores up to 80 mm. The E3 system also is an economic way for external applications with three cutting edges per insert for cost-effectiveness, whereas the GX (Gamma Line) is perfect for high cutting depths up to 26 mm and also suitable for parting off

applications. Simmill is also another highlight from the new Simtek range that uses solid micrograin carbide milling cutters with multiple cutting edges for a wide range of milling operations. These include groove milling, chamfer milling, thread milling and keyway milling throughout multiple Simmill ranges such as the A3 and the PX/SX/UX/VX. You can also carry out fine boring and face grooving with the OS system and T-Slot milling tools in the 4U and 4UV ranges with special cutting edge design for the best performance. Simcut offers high precision tooling for keyway broaching for common use on lathes as we as for driven tool slots. Thread whirling and polygon milling are also an option.

Simtek has just released a new 700 page catalogue which is available on request. For further information or to request your free catalogue, contact:

Cutwel
Tel: 01924 869 610
Email: sales@cutwel.net
www.cutwel.co.uk

New 6 mm insert takes the pressure off high ramping

TaeguTec has launched a new compact four corners double-sided insert for multiple applications: the 4NKT 6 mm insert for end mills, face mills and modular cutters.
The 90° entering angle insert, despite the double sided design, is suitable for high ramp down angle applications. Its high positive geometry generates low cutting force while the cross edge insert geometry prevents unexpected insert failure.

The new additions' increased insert thickness and high strength, combined with the cutter's wide bottom for improved clamping, enables excellent high stability and productive machining.

Furthermore, the 4NKT's smaller 6 mm size compared to the 11 mm and 16 mm sizes, increases the number of teeth on the cutter, which is not only good for machining small components but also makes it a finer pitch tool that increases productivity.

The new line of cutters is offered as end mills (D16-40 mm), modular types (D16-40 mm) and face mill types (D32- 63 mm). All cutters include an internal coolant delivery system for efficient chip evacuation that prevents built-up-edges. The 4NKT 06 inserts are available in two geometries: "M" for general purpose machining applications and "ML" for low power machining in unstable setups and long overhang applications.

TaeguTec's new line, the 4NKT 06 is ideally suited for die and mould, automotive, miniature and general purpose industries, and is a versatile tool for general face milling, true 90° shoulder milling, full slotting as well as helical ramping and pocket machining.

The Chase2Mill 4NKT new line was put to the test against several competitors' similar

offerings and was seen to substantially increase productivity and tool life. While machining grey cast iron, the new Chase2Mill 4NKT increased tool life by 25 percent versus a popular competitor's similar insert.

In another test against a competitor's tool on a work piece was made from mild steel, TaeguTec's new 4NKT increased productivity by 100 percent.

TaeguTec UK Ltd
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www.taegutec.com

ITC offers small bore tooling range

The extension of the Micro 100 line of boring tools from Industrial Tooling Corporation (ITC) has now noted the launch of the QBB series of solid carbide boring tools for turning centres and the new QBM Series for machining centres.

Manufactured from a micro grain carbide substrate that delivers astounding tool life, the innovative new MicroQuik lines have been created for machining high precision bores from a minimum diameter of 1.27 mm for the QBB line and 3 mm for the QBM series.

The flexible new system can be adapted to all standard tooling platens for high precision boring on CNC lathes and sliding head turning centres. This is possible on the QBB Line with shank diameters of 12, 16, 20, 22, 25 and 32 mm that provide compact dimensions suitable for sliding head turning centres and machines with limited tooling platen capacity as well as larger diameters for heavy duty turning centres. The overall length of the QBB ranges from 38 to 114 mm with a maximum boring depth from 3.8 to 76 mm. The boring depths and geometries have been optimised with a number of shank and maximum bore lengths available for each diameter range. This extensive variation has been made available to eliminate deflection and improve surface finishes and precision.

To prevent the sharp edges from breaking, the QBB line is also available with the option of either an 0.08 and 0.13 mm corner radius. However, with high pressure through coolant facility, an extremely tough carbide substrate and the option of an AlTiN coating, edge breakages are an uncommon occurrence for this outstanding performer.

These attributes are also apparent in the Micro 100 series of QBM boring tools for machining centres. The QBM line is offered for minimum bore diameters from 3 to 11.7 mm and maximum bore depths from 12.7 to 76.2 mm. With an overall length of 51, 64, 76, 89, 102 or 114 mm, the QBM series is provided with either an 0.08 mm or 0.2 mm corner radius.

A key innovation behind the MicroQuik series is the unique toolholding collet that works with a 3-point location system to guarantee accuracy, repeatability and tool change speeds beyond the capabilities of alternate products. Regardless of whether the end user is conducting turning or milling operations with the QBB or QBM range, the patented 3-point location system is the envy of all boring tool manufacturers.

The 3-point locking toolholders provide accuracy and concentricity to a tolerance of 12 microns centreline repeatability from tool to tool. This is credit to a toolholder design that has a locking screw and locating pin for positioning whilst each carbide tool has a flat surface for coolant to pass through the toolholder and directly to the cutting edge. To support the diverse demands of industry and the numerous machine tool configurations, ITC is supplying the new range with a selection of round or square toolholders.

ITC's state-of-the-art production facility includes CNC grinding machines from world leading manufacturers,including Walter, Schneeberger, Deckel, Rollomatic and ANCA.

The company has invested in a centralised oil filtration system to ensure that grinding takes place under optimum conditions with clean oil, and our inspection department includes computerised laser measuring equipment, to maintain the high standards for which ITC is renowned.

ITC sources and stock the best available products from around the world, and holds over 100,000 HSS Co and Solid Carbide tools on the shelf ready for immediate despatch. It can also provide a fast modification service, even same day in some cases.

It provides same day despatch on standard stocked lines, whatever your industry sector may be. From subcontractor to tool room, through aerospace, motorsport, and the medical industry, from milling, drilling and reaming to deburring, ITC has the tools and expertise to solve your problem.

As a specialist tooling supplier, ITC believes that good customer service is the key to success for itself and its customers. It stocks and manufactures the best quality products, whether standard or special, and its staff are trained to provide the best back-up for customers.

Whether you know the tool that you require, or simply know that you "have to cut this bit of material", ITC's technical representatives and internal technical team are qualified to give advice that is second to none.

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

Digital milestone for newly merged Dormer Pramet

A digital milestone following the merger of Dormer and Pramet has been reached this month (February) with the launch of a new corporate website, along with updates to its social media accounts and several new interactive apps.

The website, **www.dormerpramet.com**, brings both previous company sites together into one location to feature all relevant information on Dormer's rotary programme and Pramet's indexable tooling ranges.

Project leader, Dario Furlato says: "We have a long standing reputation for providing information and sharing knowledge in a very quick, simple and flexible way. This includes printed material such as catalogues and technical handbooks, as well as digital services, including tool selection software and apps.

"Our new website is a further example of this. It will host detailed information on our complete product range of round tools and inserts in a very comprehensive and user friendly platform.

"Dormer's rotary product programme is available to view through a dynamic search

function, which uses a series of drop-down boxes to make tool selection a straight-forward and pain-free process. This popular feature will also be replicated for the Pramet indexable range in the second quarter of the year.

"This website is a major step forward following the merger of Dormer and Pramet last year. It epitomises our 'joined-up thinking' approach."

The new site is available to view in 15 languages. In addition, Dormer Pramet has launched a series of free digital apps featuring both rotary and indexable product ranges. The apps offer access to product information, publications and technical support services in an easily accessible online format. All the apps are free to download for iOS devices on iTunes and on Android devices via Google Play, with each designed to run on both smartphones and tablets.

Included is Dormer's new Tool Box app, which is an update to its Thread size Calculator and includes a range of additional accessories to support general office or workshop tasks. New features include a spirit level, decibel meter, dimension converter and multiple language options in addition to an improved thread size calculator.

To find the rotary related apps search for 'Dormer' and to find the indexable focussed apps search for 'Pramet.'

Dormer Pramet
Tel: 0870 850 4466
www.dormerpramet.com

Reaching new heights

KAISER Precision Tooling, a leader in premium high-precision tooling systems and solutions for the automotive, military/aero, energy, medical and watchmaking industries, has introduced its EWH precision boring head. The EWH has been developed specifically for effective use with exotic materials such as titanium, making it ideal for the aviation industry.

Built for use with coolant pressures of up to 70 bar, the EWH is designed to the highest standards, with an ultra-rigid monoblock construction. This means it can meet the requirements of rigid tools and high coolant pressure that are needed for the efficient machining of difficult work piece materials.

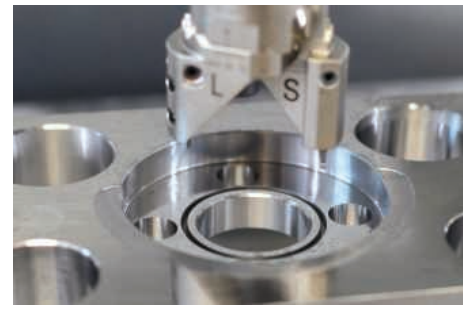
The new boring head is available with a length of 95 mm or 155 mm and includes HSK/SK/PSC interfaces.

The EWH hydraulic clamping delivers a form- and force-locked connection that clamps the tool holder perfectly, with high pressure around the entire circumference. This is a superior solution to clamp over side lock screws, which have a point and line contact on the circumference.

High coolant pressure of over 50 bar is important to ensure effective cooling, especially when cutting HRSA and titanium workpieces with low heat conductivity. If coolant was supplied with insufficient pressure, it would vaporise, and temperatures would therefore rise, reducing the hardness of the cutting material and decreasing the lifetime of the cutting edge. The high coolant pressure supports chip breaking and helps achieve enhanced chip forming.

"Its robustness and advanced design make the EWH an ideal solution for the aviation industry, and other applications that include exotic materials," says Peter Elmer, CEO of KAISER Precision Tooling. "By enabling high coolant pressure and rigid clamping, the new head improves the quality of boring, and saves money by increasing cutting edge lifetime."

Founded in 1948 and headquartered in Ruemlang, Switzerland, with subsidiaries in



Germany and the USA, KAISER employs approximately 170 employees worldwide, with a sales network covering over 50 countries. The product portfolio is 100 percent Swiss made and comprises more than 20,000 modular precision boring tools, which adhere to the highest quality standards. A trendsetter in precision, performance, innovation and service, KAISER is proud of its in-house production of digital displays and direct electronic measuring systems for digital precision boring heads to ensure absolute setting accuracy and eliminate operating errors.

KAISER Precision Tooling AG
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Email: david.stucki@kaisertooling.com
www.kaisertooling.com

5-axis vice bites into the medical sector

Dixons Surgical Instruments is an established high quality medical equipment manufacturer. However, a change in the complexity of products manufactured has required a fresh approach from the business. Lang 5-axis workholding vices, from Thame Workholding, have supported the transition of the company from hand crafting to precision engineering.

A third generation family-run business, Dixons Surgical Instruments operates from its well-equipped manufacturing facility in Wickford, Essex. Originally established by managing director, Jay Dixon's grandfather in 1948, the company has made some radical changes during the past 5 years.

"We have always manufactured traditional surgical instruments, such as rib spreaders, suction tubes and hand held retractors, but in the past 10 years or so we have been moving more towards the manufacture of bespoke orthopaedic instrumentation" explains Jay Dixon.

"The surgical instruments we have traditionally made are generic and you could buy the same designs from a number of suppliers at a variety of prices and qualities. Today, the traditional surgical instrument market is increasingly opting for products made in low cost economies such as Pakistan. The orthopaedic work is more specialised and much higher precision. The instruments are designed by the client specifically to prepare the bone to accept a particular implant. The success of an orthopaedic procedure has much to do with the accurate placement of the implant, which is controlled by the instrumentation. Orthopaedic companies are not prepared to compromise on the quality of this instrumentation as it has such a bearing on the overall outcome for the patient."

Most of the components produced by the company are stainless steel, in 17/4PH, 420 Martensitic and 300 Austenitic grades with some titanium, and most are small enough to fit in the palm of your hand. Following a thorough investigation of the various systems available the company invested in the Lang Makro.Grip 5-axis workholding system supplied by Thame Workholding at the beginning of 2014.

"Previously, we would waste an incredible amount of material as the bar stock was held in a 3-jaw chuck on the 4th axis of our Mazak VMC, and had to protrude far enough out so the spindle nose and cutting tool could access it. The Lang 5-axis vices are so compact that the cutter has far better access, and we now only waste a few millimetres of raw material where the clamping points are stamped into the stock," states Jay Dixon.

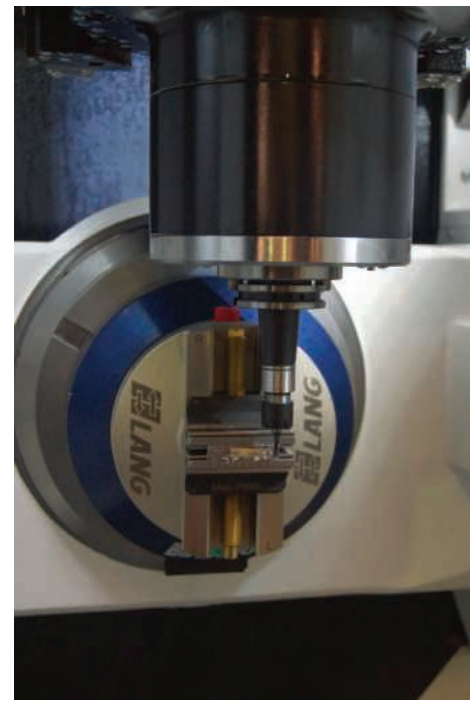
"After stamping, the raw material can be held with a much lower clamping force and the pyramid shaped indents provide accurate datum points so the material can be loaded into the vice without the need for end-stops. Our machinists quickly appreciated the benefits after they had seen it in operation."

As well as saving raw material one of the major initial gains was using the integrated zero-point interface on the back of the vices to allow the accurate repositioning between Op 1 on the bed of the machining centre, and Op 2 on the 4th axis.

To enable the continued growth into more complex orthopaedic work, the company has recently installed a Mazak Variaxis i500 5-axis machining centre. The machine has been specified ready to take the Lang automation system that will feed raw material into the machine and remove the completed parts to allow unmanned machining overnight.

"We already run our EDM machine and vibro finishing equipment overnight," Jay Dixon explains, "but the intention is to machine parts more efficiently by loading the automation system and letting it run. An average batch for us is 10 to 50 off with typical cycle times between 20 and 90 minutes, so an automation system is an ideal method of meeting the demands of our customers."

"The Lang workholding equipment is great value for money, especially when you consider that you can buy the automation ready vices and they are basically the same price as the standard ones. With any other automation system you would also have to factor in the cost of their pallets. With Lang, it's already built in to the vices. We hope to be ready to run lights-out within the next 6 months or so."



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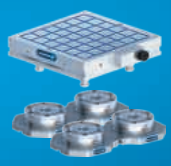
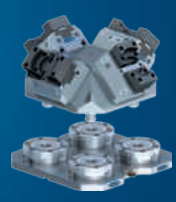
Combination with tombstone

Combination with system KONTEC



Combination with MAGNOS magnetic clamping technology

Combination with ROTA chuck



Combination with system TANDEM

Leader offers extended CARVEsmart range

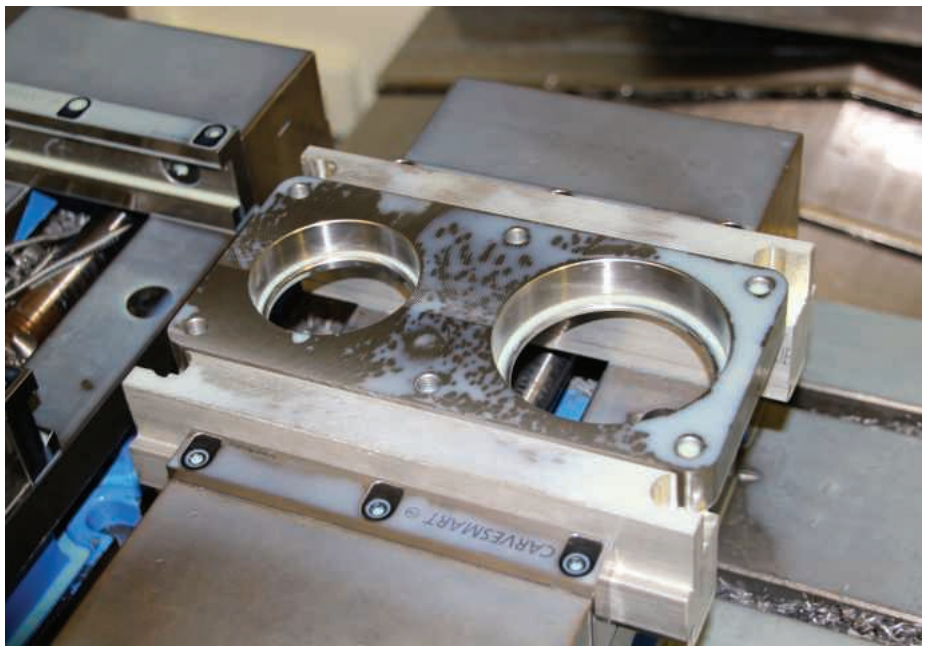
The Patented CARVEsmart quick-change vice jaw system from America, available exclusively in the UK from workholding specialist, Leader Chuck Systems, has recently been expanded. The range now includes a fully accessorised 4 inch tool steel master jaw set; SMARTstop for repetitive setups; PERMAjaw, a flip-over ductile cast iron jaw; two new extruded aluminium profiles and new cut-to-any-length flip-over extrusions. Designed for production and toolroom applications, the expanded CARVEsmart system can replace the often cumbersome, conventional method of attaching vice jaws to a vice using face mounted cap screws.

The CARVEsmart MJSSG4 4 inch 4140 ground tool steel master jaw set has been designed for production work. Ground flat and parallel within 5µ this high quality set is fully accessorised with all SMARTstop options and accepts all CARVEsmart cut-to-length jaw stock.

SMARTstop is a highly repeatable, front loading, internal to the jaw, vertical slot and dowel pin location system included in 4" and 6" CARVEsmart steel ground master jaw sets. Step and carved jaws will repeat +/- 7.5 micron when replaced in the original master jaw. Operators can dowel pin the aluminium jaws ready to be reused or purchase SMARTstopped (pre-pinned) 4" and 6" jaws in all five aluminium profiles, 1018 or ductile cast iron jaws.

PERMAjaw is a SMARTstopped, ductile cast iron jaw set available in 4 and 6 inch. It is 19b mm wide by 43b mm high and can be flipped over to expose a fresh face. Able to repeat in the same master jaw to +/- 7.5 micron PERMAjaw is an ideal solution for recurring jobs, with the ability to have a profile on both sides of the (flipped) jaw.

"CARVEsmart offers the most complete dovetailed quick-change vice jaw system and provides a number of benefits. While conventional vices attach the jaws to the face of master jaws via cap screws, the CARVEsmart system uses master jaws with a female dovetail profile designed to accept vice jaws with a male dovetail profile. So, the jaws can be front-loaded or slid into the side of the master jaws, and are secured via clamping elements accessible at the top of the master jaws. With no face mounting cap screws to avoid the soft jaw extruded stock is fully machinable, making inexpensive cut to any length vice jaws," says managing director Mark Jones.



Jaws are removed by loosening, but not removing, three channelled clamping elements in the top of each master jaw. As the clamping elements are located at the top of the master jaws, it is not necessary to open the vice as might be required to access cap screws in a conventional vice configuration. A CARVEsmart jaw can be changed in less than one minute.

Mark Jones concludes: "Re-cutting the female form with each part run matches the jaw and vice perfectly to the spindle. CARVEsmart dramatically reduces setup time, improves setup reliability and quality. This makes the system ideal for workshops that change vice jaws often; running recurring, tight tolerance work."

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

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2D CNC turns to Roemheld

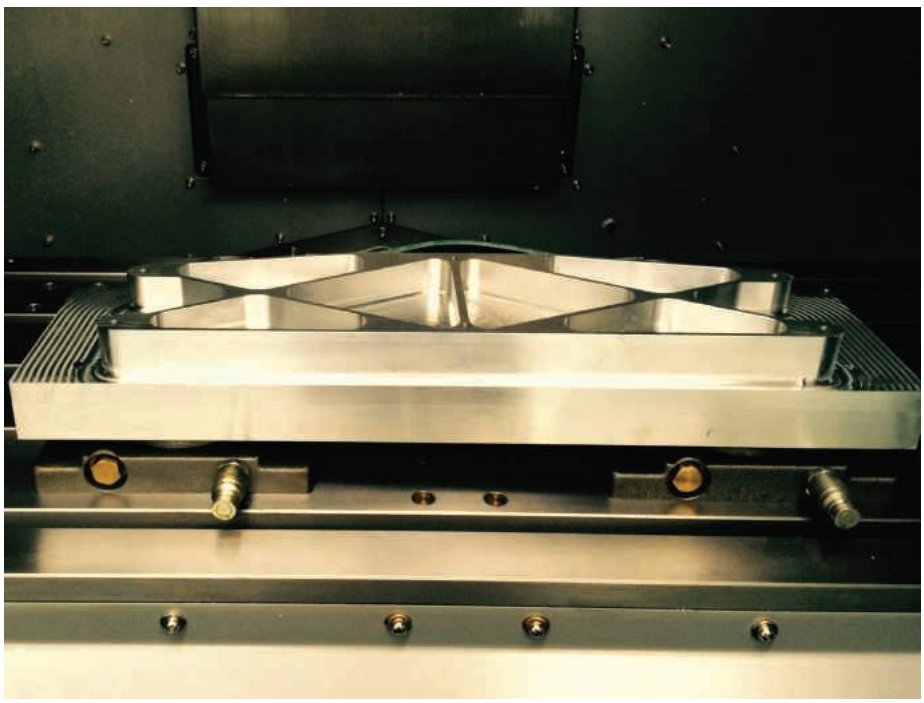
With new premises, quality partnerships and a proven reputation as a solution provider, 2D CNC Machinery means business.

Installing a machine to fit exacting production requirements involves a huge investment in time and resource. That is why 2D CNC Machinery offers a full turnkey service: from sourcing the machine, agreeing the specifications and liaising with third parties through to installation, training and offering full, ongoing technical support. That is also why the company only uses high quality components from Roemheld.

David Holden director of 2D CNC says: "When you have good quality machines you don't want them undermined by the poor performance of the auxiliary equipment. We can support our customers for 24 hours a day, 7 days a week; sometimes for up to two years as standard. The only way we can achieve this is by selecting reliable components that are easy to install and maintain. We know of machines we have supplied that have delivered 99 percent plus spindle availability over a two year period as well as machines that are 30 years old and still going strong."

The 2D CNC team have individually and collectively used the Roemheld product range for many years and all of the company's showroom Wele machines are fitted with Roemheld elements. This commitment to quality and precision is an important factor in the success of the total solution approach offered by the business.

David Holden explained: "Many of our customers come to us with a specific need, whether it's looking to setup fourth axis workholding or specific toolholding requirements. We will then supply the solution. This often involves us being on-site for weeks at a time, installing, setting up and training. That is why it is important we have faith in the quality of our solutions including any auxiliary components. A vice might look the part, but that is no use if it goes wrong. We often commit to very tight response times and therefore might need to be on-site within four hours of our customer's call. Using components other than Roemheld ones is a false economy in my opinion. "



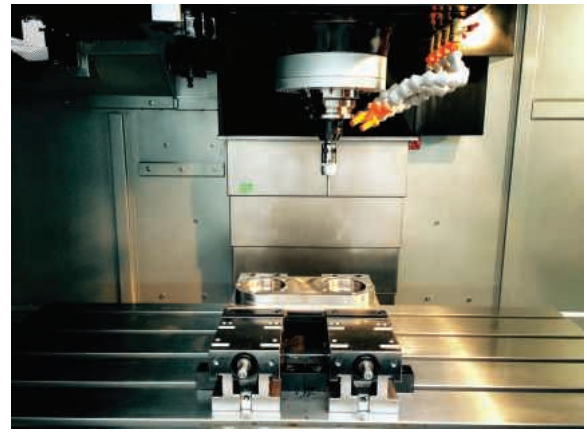
For David and his fellow director, David Johnson, supplying leading machine tool solutions is a labour of love. David Johnson has worked for 27 years with Toyoda in the UK, while David Holden has spent a large part of his career working with Mitsui Seiki and Toyoda. They met whilst David Holden was working for 600 Centre as general manager and David Johnson was working for Toyoda UK as service & general manager. They then set up 2D CNC in 2009 to supply high-value technologies to all industries including automotive, aerospace, construction, die/mold, medical, power generation and general machining sectors.

2D CNC is the UK distributor for Toyoda, Mitsui Seiki, Wele, Reiden and Fermat CNC machine tools. The company offers customers 24 hour, UK-wide, service and support via its dedicated support team of experienced, factory trained mechanical, electrical and commissioning engineers. An understanding of the entire technology 'value chain' enables 2D CNC to support customers at every stage of the process: from product introduction and volume manufacturing through to service and support for the lifetime of the machine.

Turnover has doubled year on year and, in February 2014, the company moved to

brand new, 7,500 sq. ft. premises, in Hinckley, Leicestershire. The premises include a showroom that allows them to showcase machines and also enables customers to view machines before installation. David Holden explained: "Previously, customers would have gone out to Japan, for example, to do a Factory Acceptance Test (FAT). However, we can bring the machine in to our premises and set it up so customers only have to come here to approve it. We will then deliver and install according to customers requirements."

The company is confident that this investment in new premises alongside its proven ability to offer high quality, turnkey solutions, will ensure 2D CNC remains competitive within the machine tool marketplace.



Roemheld is committed to researching and developing products designed to meet not only the demands and expectations of today's discerning buyer, but also emerging markets and applications. Through continued improvement of products and services, the Roemheld Group intends to remain an innovator at the forefront of technology providing 'All your workholding needs from a single source'.

Roemheld (UK) specialises in delivering flexible, cost-effective, workholding solutions that are designed to increase work throughput while also reducing handling times, raw material required per billet and overall cycle times.

Roemheld is the only UK supplier of Hilma 5-axis vices, Roemheld hydraulic clamping, Stark Zero Point Mounting Systems, M-TECS Magnetic Clamping, Modulog assembly and handling equipment and Kostyrka Clamping Sleeves.

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Cirrus Aircraft utilises FARO Laser Tracker for robot calibration

Cirrus produces the world's top two best-selling piston-engine general aviation aircraft, the Cirrus SR 22 and SR22T, with an unmatched integrity in design, quality, and engineering. Using an analytical approach, Cirrus embraces industry best-practices when it comes to analysis and modeling. Using this methodology, they are able to understand the structural characteristics of materials and components and then build a computer model. This process begins by predicting the characteristics of composite structures, using analysis, and then validating the collected data with the computer models. This process is an expensive one, but demonstrates Cirrus' commitment to quality and safety. This analytic approach continues with the development of the Cirrus Vision SF50, a single engine, low-wing, personal Jet. The Vision SF50 is designed to fill a significant niche between piston aircraft and light business jets. Like every Cirrus aircraft, the Vision will also incorporate the Cirrus Airframe Parachute System (CAPS) which can safely lower the entire plane to the ground in case of an emergency.

Challenge

To eliminate the need for racks of hard-tooling for the new Vision SF50 Jet project, Cirrus significantly invested in converting a 6-axis manufacturing robot into a CNC milling machine. This robot, a KUKA KR-100 HA L80 (High Accuracy), uses a vision camera to locate and align to a part and then drill any required holes and trim off any excess flashing to define final part shape. The KUKA has a working radius of 9-feet and is mounted on a 40-foot linear axis rail, just long enough to accommodate the 38-foot long wing of the SF50 Vision. The fuselage cabin structure is 5.1 feet wide, 4.1 feet tall, and 30.9 feet long. Smaller parts, parts as small as 6 in x 4 in x 2 in, can also be cut by the robot while being held in place by a vacuum table. Larger parts, however, utilise dedicated holding fixtures. Cirrus needed a solution to validate the setup of the robot and to ensure its true position accuracy. They were seeking technology that would allow the real-time validation of trim paths and drill accuracies without potentially inducing defects to a physical part through trial and error. Accuracy was the number one priority.

Solution

Cirrus uses a 12-foot FaroArm with a Laser Line Probe along with a a bridge-style fixed CMM for many projects. However, due to the size and accuracy demands of this project, neither provided the ideal solution for mapping the KUKA robot. To properly map the robot for their trim and drill needs, Cirrus integrated a FARO Laser Tracker into their processes. The Laser Tracker has a large working volume (230-foot diameter) and automatic SMR (Spherically Mounted Retroreflectors) tracking, making it the ideal tool for mapping the robot. The large working volume alleviates the need to leapfrog (Move Device Position) a smaller volume measurement arm, which can quickly degrade the overall accuracy below the acceptable limits afterseveral iterations. Being able to measure any point in the robot cell with the Tracker has proven to be critical to the process. During setup and mapping, the Tracker was dedicated full time, for eight weeks, to the robot cell. Using FARO's SDK (Software Developers Kit), Cirrus was able to have the robot program tell the Tracker when it was in position and command the Tracker to take a measurement. The true position is then compared to nominal and a compensation table is generated. Based on that compensation table, positional refinements occur and move the robot into the correct location. As a result, after a successful setup and mapping process, accurate hole locations and trim profiles can now be achieved before the first part is ever cut.

Results

Cirrus was able to use the FARO Laser Tracker to realise a 60 percent reduction in tooling costs by minimising the quantity and complexity of trim and drill fixtures. This, paired with the agility of the robotic system to rapidly accommodate design changes, will lead to an overall reduction of time and cost for the entire SF50 Vision program as it nears FAA certification. The FARO Laser Tracker Vantage proved to be the comprehensive solution that Cirrus was seeking, as the ideal tool for robot calibration, tool design, fabrication, validation, and adjustment.

FARO Technology UK Ltd
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Hexagon Metrology extends high-accuracy Leitz Reference line

New size of measuring machine offers versatile inspection for small workpieces with tight tolerances

Leading measurement solutions provider Hexagon Metrology has announced a new frame size for its high-accuracy coordinate measuring machine (CMM) range. The Leitz Reference HP 7.7.5 offers a compact solution ideal for measuring small workpieces with tight tolerances.

Using the proven design of the Leitz Reference line and with a measurement range of 700 x 700 x 500 mm, the Leitz Reference HP 7.7.5 provides the low levels of measuring uncertainty required by precision manufacturers. Equipped with the Hexagon Metrology HP-S-X3 Scanning Probe Head as standard, it can carry stylus configurations of up to 360 mm in length and 150 g in weight.

"The Leitz Reference HP 7.7.5 features all the technology that gives this range its characteristic accuracy, versatility and throughput," explains Ingo Lindner, stationary CMM product line manager at Hexagon Metrology. "This compact size has a small footprint but huge application potential across a number of industries."

Designed as a universal measurement system with scope to adapt to a number of jobs throughout the production process, Leitz Reference line machines offer customers an efficient multipurpose solution without compromising on accuracy. Available with PC-DMIS or QUINDOS metrology software, they can also be configured as gear inspection centres.

The new Leitz Reference HP 7.7.5 is available to order immediately through local Hexagon Metrology commercial operations with shipments beginning in May 2015.

Hexagon Metrology offers a comprehensive range of products and services for all industrial metrology applications in sectors such as automotive, aerospace, energy and medical. We support our customers with actionable measurement information along the complete life cycle of a product, from development and design to production, assembly and final inspection.

With more than 20 production facilities and 70 Precision Centres for service and demonstrations, and a network of over 100 distribution partners on five continents, we empower our customers to fully control their manufacturing processes, enhancing the quality of products and increasing efficiency in manufacturing plants around the world.

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An overview of Baty quality

As a leading global designer and manufacturer of high-quality Close Circuit Television (CCTV) Cameras and control mechanisms, London based Overview Ltd has an in-depth knowledge of camera control systems and a profound understanding of advanced electro-mechanical PTZ (Pan, Tilt, Zoom) control solutions. The company's expertise and market leadership in these areas ensured that Overview was an extremely discerning customer when searching for a highly accurate vision measuring system for component inspection.

Overview's expanding product range and increased levels of production, have been driven by strong export sales, which had brought about the potential for bottlenecks occurring in the company's Inspection department. To help avoid the prospect of delays, a decision was made to review the optical measuring systems available in the market. Mindful of the need to accommodate anticipated higher future production levels, the company considered systems that featured a larger measuring range that could accommodate multiple parts, with the added benefit of automatic CNC operation.

Having applied the company's CCTV and leading electro-mechanical systems knowledge to the review process, senior staff recommended the purchase of a Venture Plus, multi-sensing, CNC vision measuring system from Baty International.

Xanadu Hewitt, overview operations and quality assurance manager says: "Overview Limited is a privately owned British company. We are the leading UK specialist designer and manufacturer of CCTV camera control mechanisms and CCTV speed dome solutions.

"The reputation we enjoy is due largely to the quality of our products. To help ensure the reliability of the elements that make up our product, including mechanical mechanisms, electronics such as circuit boards and optical components, our components have extremely tight dimensional tolerances."

"Also, as our CCTV systems are exposed to extreme weather, the highest standards of precision are applied to our housings to ensure outstanding sealing properties.

"Amongst other activities, design, verification and assembly take place at our busy London HQ. Parts are shipped in from several worldwide sources; therefore we had a growing need for an accurate, optical measuring system for use in areas such as first article approval, design and mass production authorisation, and also for batch inspection. To allow us to scrutinise the maximum number of potential systems, we made a visit to the Control show in Germany.

"Having rejected some of the available machines as they were unable to meet our challenging accuracy needs, and after being impressed by an excellent demonstration and by the specification, build-quality and ease of use of the Venture Plus, we placed an order with Baty International, for a Venture Plus, CNC vision measuring system.

"In addition to its advanced optical measuring capability, the Venture Plus has the advantage of a tactile probing system. The machine is also very easy to programme, we have now written part programmes and recall them when needed, enabling us to perform fully automatic CNC inspection routines. Baty's software is very intuitive and provides all of the information we need, it also generates very useful statistics and allows us to electronically store inspection reports.

"Support was also an important element of the decision-making process. If we have questions, or need help when performing inspection routines for the first time, the Baty staff provide useful help over the phone or via email."

Baty International is one of the world's leading manufacturers of optical profile projectors, coordinate measuring systems and gauging products. Baty's product

range includes two dimensional, profile measuring equipment and full three dimensional coordinate measuring systems.

Fusion metrology software has been the foundation for Baty's camera based inspection systems for more than a decade. The combination of ease of use, advanced edge detection and graphical reporting has ensured the continuing popularity of Fusion software. The use of Fusion renders CNC programming a simple teach and repeat process. By measuring a part in a straightforward manual mode, a full CNC program is automatically produced. The system's zoom lens and fully segmented LED lighting system can also be controlled from software so that all magnification & lighting changes are recorded into the program, re-creating the same conditions every time a new component batch is measured.

Baty's Venture CNC models are able to automate the inspection process, advanced inspection routines, such as scanning and best fitting, can be achieved accurately and quickly with minimum operators input.

Measurements from data points taken using the Venture Plus's touch probe can be combined with those taken using video edge detection optimising speed and reducing inspection times.

The Venture Plus range includes all of the standard Venture features with a little more... measuring range, that is.

Large Measurement Volume

The Venture Plus is available in four models:
VP-6460 with 640 mm x 600 mm x 250 mm measuring range
VP-6490 with 640 mm x 900 mm x 250 mm measuring range
VP-101040 with 1000 mm x 1000 mm x 400 mm measuring range
VP-101540 with 1000 mm x 1500 mm x 400 mm measuring range

The bridge type construction is all aluminium resulting in low inertia and low thermal mass. Air bearings are used on all axes and a granite Y beam is used for increased accuracy. This ensures that the machine will expand and contract uniformly with temperature changes ensuring minimal distortion and subsequent errors. Ambient temperature can be compensated for within the Fusion software making Venture Plus ideal for use on the shop floor.
Complete with standard zoom optics and programmable, segmented LED surface lighting, Venture Plus offers the same level of camera based functionality as every other Venture.

The use of a touch probe is optimised on a CNC system. Measurements from data points taken using the touch probe can be combined with those taken using Video Edge Detection for optimum speed and reduced inspection times.

A probe changer rack can be installed so that probe modules fitted with a variety of pre-calibrated styli can also be used in the same inspection. When a change of stylus is required, the system automatically puts the current probe module back in the rack and picks up the next to continue the inspection process. Only now can this functionality be combined with traditional touch probe technology to offer the ultimate in large format multi-sensing Vision systems - Venture Plus.

Baty International
Bowers Group
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Handheld thermometer for high-temperature applications

Raytek® has introduced a new handheld thermometer series for flexible temperature monitoring in high temperature industrial applications from 400 to 3,000 °C, such as steel production and processing, chemical and petro-chemical industry, as well as heat treatment and power plants. The Raynger® 3i Plus handheld thermometer is ideal for the flexible monitoring of critical processes and quick verification of fixed sensors.

The Raynger 3i Plus 1M and 2M models measure infrared radiation in the shortwave spectrum (1 µm and 1.6 µm) and provide high precision (+/- 0.5%, 1 °C). Thanks to the superior resolution of 250:1, critical plant parts and products can be reliably monitored from longer distances. For exact aiming, the measurement spot is high-lighted with two laser beams. More-over, even red hot objects can now be easily targeted by means of a new ''Red Dot'' scope sighting function (patent pending). Additionally, the use of a ''Red Nose'' heat-resistant warning detector and alarm reduces the risk of the sensor overheating, minimising repair costs, while averting costly accidents and ensuring operator safety. The robust handheld devices withstand drops of 1 m. A powerful firmware supports display, analysis, and trending within the device. Up to 4,900 data points can be recorded. The scope of delivery furthermore includes the Raytek DataTemp® windows PC software which supports real-time communication and further data processing. In addition to on-board USB and Bluetooth interfaces, a mobile app allows for comfortable data storage and sharing.

The display can be set to degrees celsius or fahrenheit. The devices are equipped with a Lithium-ion battery that can be easily recharged and allow an operational cycle of 24 hours.

Raytek GmbH develops and produces infrared sensors under the brands of RAYTEK and IRCON for non-contact temperature measurement within a range from -50 to +3,500 °C. The sensors allow for quick and accurate measurements of surface temperatures without touching the medium. Typical applications include steelworks, glassworks, cement plants, and plastics manufacturing. The Raytek product range includes fixed infrared sensors, infrared linescanners, and thermal imagers. All the devices are suitable for fixed installation in plants and machines and can be integrated into process-monitoring systems via industry-specific interfaces.

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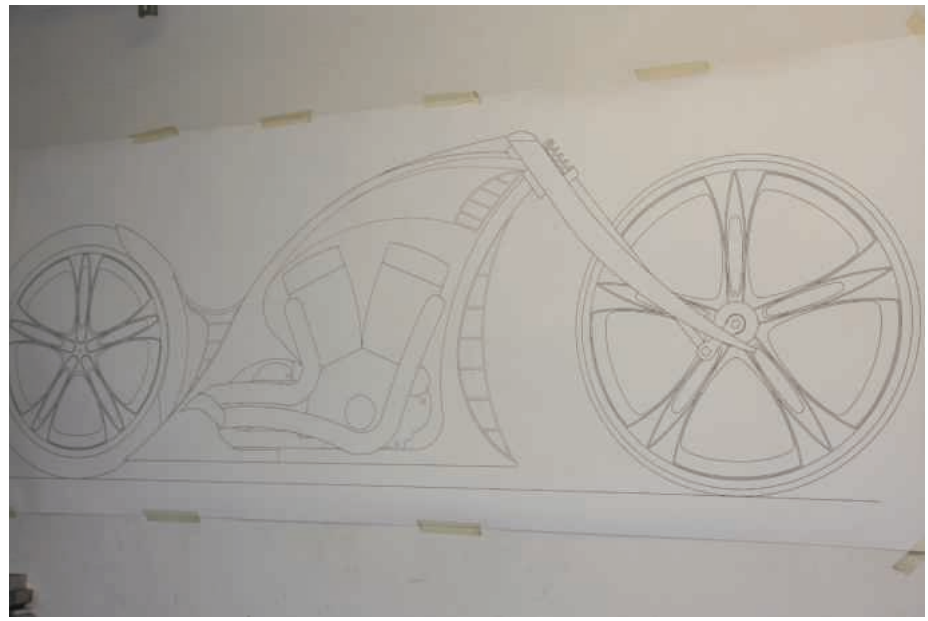
www.raytek.de

Thunderbike invests in innovative solutions

Part of what makes Thunderbike so successful, is that the leading provider of custom-tailored bikes uses a carefully selected network of manufacturing partners. Considering that individually milled parts make up 80 percent of the product, choosing the right partner is critical to its success.

Thunderbike relies on the hyperCAD® and hyperMILL® CAD/CAM systems from OPEN MIND and the developed NC programs are then processed on modern 5-axis machining centres equipped with TNC control units from HEIDENHAIN. The many prizes won at custom bike building competitions clearly demonstrate that the design shop, which is based in the German town of Hamminkeln, is doing things the right way.

The word has spread, and now half of Thunderbike's customers are from outside of Germany. "Our custom bikes cater to a highly exclusive clientele. What makes us stand out is our attractive designs and the superior quality of our customised bikes," says Andreas Bergerforth, managing director of Thunderbike.



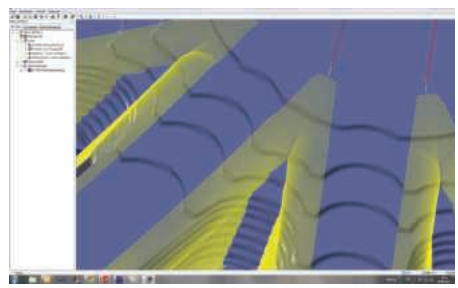
One victory after another

The ongoing success of Thunderbike on the international stage is in part due to the bike shop's consistent participation in renowned competitions within the bike community. Notable creations include the 'Open Mind' bobber or 'Spectacular'. The Spectacular gained Thunderbike two awards in 2006 as it won the European Championship title and came in second in Sturgis. Another highlight was the 'Build a Billy' bike project, which involved building a high-end show bike in just three days at a trade show. The entire building process was filmed. In 2012, the 'PainTTless' café racer was the well-deserved winner of the World Championship in Sturgis in the U.S. So whenever Thunderbike announces a new bike project, the global biker community holds its breath, because Thunderbike is clearly setting the pace.

Unbreakable: A new bike in the making

When the 'Unbreakable' project bike was first announced during 'European Bike Week' 2013 at Austria's Faaker Lake, which provides the backdrop of Europe's leading Harley meeting, it was purchased right then and there. The customer's ideas had been accounted for in the conceptual phase, which is mainly concerned with making technical drawings and scribbles. The cruiser features elaborate curves in art-deco style and has an extremely low seat. Initial drafts were made following discussions between Andreas Bergerforth and his team of engineers. As Herbert Niehues, who is in charge of custom bike production explains: "We start with the frame and the sheet metal parts. We work this way because the lead times are longest in these areas."

The sheet metal parts are shaped manually and are then sent to a partner for a special paint job. For this bike, the entire drive technology and electronics system was designed using original Harley Davidson parts. "This means that the engine, gearbox, EFI, keyless-go, alarm system, turn signal reset and so on, is built into the bike based on proven components that can be serviced in any garage," says Andreas Bergerforth. The newly invented girder fork is an innovative highlight. Its compact design can be raised or lowered 80 mm with pneumatic cylinders. Similar to a telescopic fork, the lateral beams connect directly with the steering head and thus tightly integrate with the bike. The fork contains several milled parts. And for Thunderbike, it goes without saying that the triple clamp, indicators, wheels, radiator grille, tank cap and seat are all milled in their own machine shop. The engine and gearbox cover designs feature the characteristic parallel ribs.

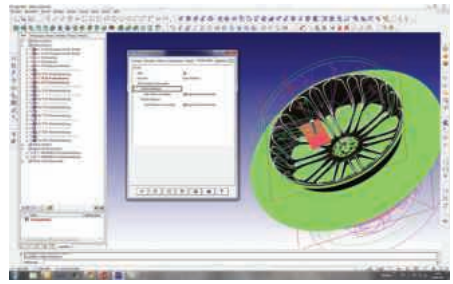


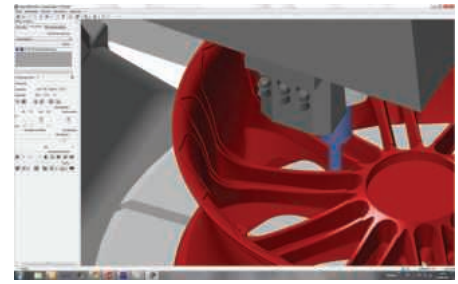
Investing in the freedom to design at leisure

Ever since 2004, these aesthetic free-form surfaces have been programmed with the hyperMILL 3D CAM/CAD system from Open Mind. As Herbert Niehues recalls: "Even back then, traditional techniques weren't cutting it anymore when it came to implementing our sophisticated designs. The highly flexible CAD/CAM system with its cutting-edge machining strategies had me fascinated and convinced from the start."

The software has been making optimal use of the machinery for close to ten years now. In the meantime, the bike company built up a process chain including CAD, CAM, 5-axis simultaneous machining and turn-mill technology that is unrivalled in their market segment. The machining hall is furnished with a DMC 104V Linear and a DMU 70 eVolution 5-axis milling centre with belt drive and sprocket wheel. In addition to this, the machine shop has a C42U MT 5-axis

turning-milling centre from Hermle, equipped with the brand-new TNC640 HEIDENHAIN control. Incidentally, all machines, including two additional turning centres are equipped with HEIDENHAIN TNC controls. "The TNC controls are built for shop application. They superbly cater to our needs," says Herbert Niehues.





High-performance process chain

All parts are designed and modelled using the SolidWorks CAD system. All individual parts are given a coherent design and the entire project is developed step by step in a virtual construction kit for the parts. This greatly facilitates the task of harmonising and evaluating all components in terms of their aesthetics, accuracy of fit and ease of assembly.

At the same time, complementing work is performed in hyperCAD, in particular as regards manufacturing and supplied parts as Herbert Niehues comments: "hyperCAD gives you an amazing amount of flexibility, in particular in the free-form area, as you approach the machining stage."

Thunderbike certainly needs this flexibility, for example, when it comes to building the newly designed wheels for the 'Unbreakable' with a diameter of 26 inches for the front wheel and 21 inches for the rear one. Their inner free-form surfaces are reminiscent of turbine blades. These aesthetic highlights are first machined on the new Hermle turn-mill system equipped with a HEIDENHAIN TNC 640 from a block of aluminium at no more than 800 rpm. Next, the contours are added in a 5-axis simultaneous milling job. "For us this means that we can get the job done with less re-clamping, shorter re-tooling and auxiliary processing times," says Herbert Niehues.

What used to be six job steps on three different machines has been reduced to three job steps, all of which are handled by the turning-milling centre. Given an annual workload of six to ten single-part and another 80 to 100 multi-part wheels that take up to 40 hours of machine time per wheel, this represents a considerable improvement. The hyperMILL CAM/CAD system with its 5-axis strategies plays a crucial role in this context. Since many jobs are performed on a solid stock, the efficient stock roughing and rest material roughing strategies are applied quite frequently. What further simplifies programming is that already existing programs for component areas can be cleverly reused.

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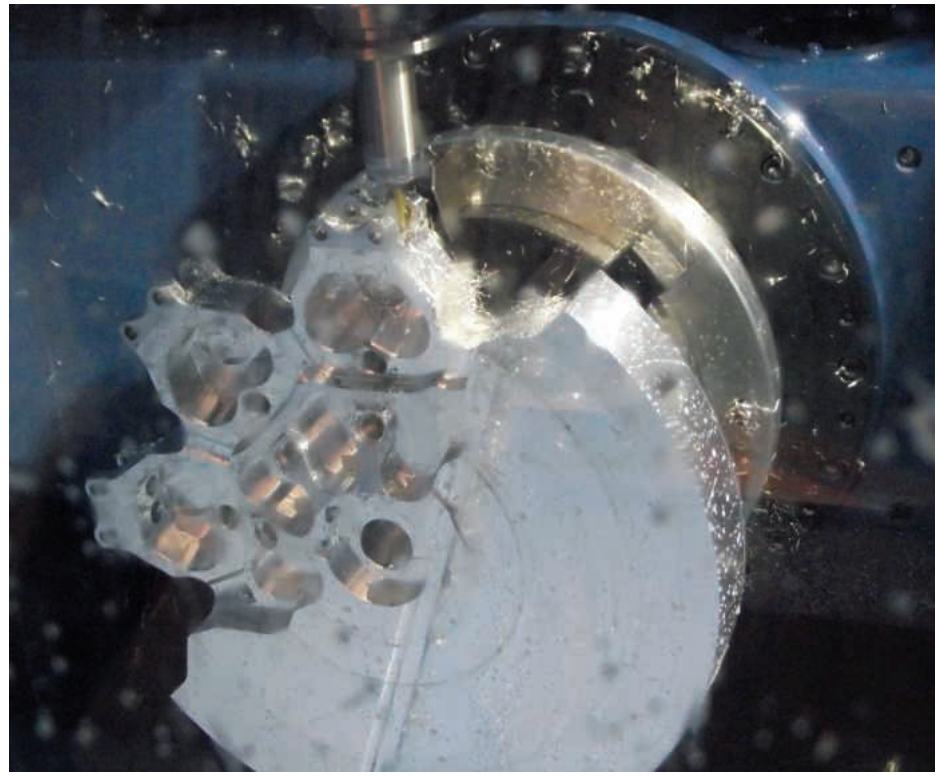
Vero excels at Southern Manufacturing

The highlights of Vero Software's presence at the Southern Manufacturing Exhibition were strong leads, and demonstrating exciting new and enhanced functionality in the latest 2015 releases of Alphacam, Edgecam, Javelin and Radan, to both potential new customers and existing users.



EDGECAM:

For Edgecam there was an added bonus, machine tool suppliers Matsuura and Romi both used the software to program machining demonstrations on their own stands. Edgecam strategic partnership manager Wesley Tonks says: "Demonstrating the principals of Edgecam's offline programming system on our stand, then the visitors going to see the physical results on the machine tool was a major plus."

Romi showed Edgecam's high speed Waveform milling roughing strategy on a D-800 VMV machine, and Waveform turning, which is new in Edgecam 2015 R1, on a GL-240. And Matsuura demonstrated how the software is ideal for 5-axis machining by programming a scaled-down version of a helicopter rotorblade cover on their best-selling MX-520 5-axis machine tool. Visitors to the Vero stand also saw onscreen demonstrations of Edgecam's multiple setup support, the new engraving cycle, ordering of profiling and roughing, and new commands in workflow solids

ALPHACAM

Demonstrations of Alphacam 2015 R1, the largest release delivered by the Alphacam development team showed how it helps manufacturers drive down costs, by speeding up their design and production processes, improving efficiency, productivity and profitability. A new advanced 5-axis machining module includes a comprehensive set of strategies with advanced tool axis control and intelligent collision avoidance, to quickly and accurately machine surface and solid models.

A new ribbon bar interface enables users to quickly find the commands they need, as they are arranged in logical groups, assembled together under tabs. The quick access toolbar can be displayed above or below the ribbon bar and includes the most commonly used commands, such as open and save. Users can customise the ribbon bar by adding their own favourites.

Also new in 2015 R1 is aggregate tool holders, enabling users to define them with geometry extrusions and rotations, STL and solid CAD models. These toolholders, or aggregates, can either be extruded, evolved geometry or solids. Common applications of aggregates are horizontal routing and drilling. C-axis aggregates are also supported in Alphacam simulation. Multi drill heads now have graphical support, as with the aggregates, they can be defined using geometry extrusions and rotations, STL and solid CAD models. Tools are loaded and selected in Project Manager and fully simulated.

RADAN

Visitors to the Vero stand saw how the 2015 release of the sheet metal software

combines all aspects of it for the first time. A number of the 180 enhancements in Radan 2015 help bring all aspects of the software together: CAD/CAM, Radbend, Radm-ax, Radtube and the logistics products. "When people think of Radan they think of the world's most powerful sheetmetal CAD/CAM software," says product manager Olaf Körner. "But Radan is actually a whole suite of connected products. "For example, there is a major connection between 3D in CAD/CAM and the Radbend press brake software. When manufacturers unfold a model they need to know how the bend process will be affected further down the production line."

This is aided by strengthened 3D translation procedures, which he says import information more consistently. The routines for automatically calculating the thickness of imported parts have also been redesigned giving faster and more accurate results. Automatic face selection now applies to unfolding, and there is a simple way to manually specify the top face much earlier in the process. "Telling Radbend at the 3D stage which is the protected face ensures the visible face of the part is scratch-free."

The bend parameters used by Radan 3D to unfold parts can now be changed using a new editor in the Unfolding Dialog, by simply sliding points on the graph to adjust the values.

JAVELIN

Visitors to the Javelin stand saw how the production control system's 2015r1 release contains a powerful new customer relationship management option aimed at helping manufacturers maximise sales. It is more focused on converting opportunities with prospects and existing customers into a sales order than conventional CRM systems. While previous releases have had basic functionality for recording contact with customers and prospects, the new module provides the means to register all opportunities for additional work and to follow it through with a series of tasks and automated triggers.

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

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

Vero is part of Hexagon (Nordic exchange: HEXA B), a leading global provider of design, measurement and visualisation technologies that enable customers to design, measure and position objects, and process and present data.

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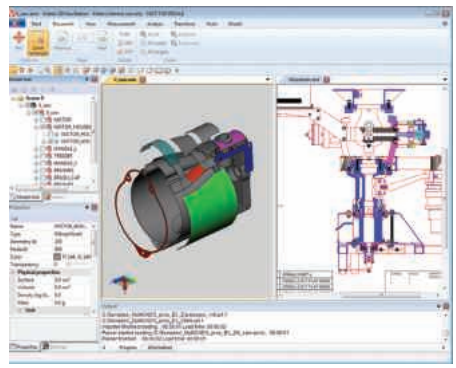
KISTERS 3D ViewStation V2015.0 goes 2D

KISTERS has announced the release of the V2015.0 3DViewStation. The KISTERS 3DViewStation is known for its modern user-interface and high performance 3D-viewing as well as Digital MockUp (DMU), current and mature CAD-importers for Catia, NX, Creo, SolidWorks, JT, 3D-PDF and STEP, plus a reasonable set of functional tools to view, analyse and communicate 3D-data as, for example, STEP, JT or 3D-PDF.

3DViewStation V2015.0 ships with a fresh Office compliant user interface and provides functionality, which can be leveraged by the user quite intuitively. The focus of the latest developments has been set to significantly enrich the 2D file format support.

There have been several 2D file formats added: besides 2D-PDF and CatDrawing KISTERS 3DViewStation now also supports DWF, HPGL, HPGL/2, Gerber, BMP, CALS, GIF, JPG, JPEG2000, PBM, PNG, PNM, PPM, TIFF. Support for DWG, DXF and Office is under development right now. Regarding 3D file formats, KISTERS



3DViewStation now offers support for the latest NX 10, Solidworks 2015, JT 10 and Parasolid 27. Catia Piping objects are also supported and a STEP healing function has been added.

Other news include the explosion of solids into faces, a convex hull calculation, improved clash detection and transparency handling.

The KISTERS 3DViewStation is developed very close to customer requirements, available as Desktop, ActiveX and HTML5 WebViewer product-version. All product flavours are intended to be used together with a PLM, ERP or other management system, all necessary APIs are provided. For cloud, portal and web-solutions there is a HTML5-based browser solution available, which does not require any client installation at all. All file formats can be used in combination with the intelligent navigation and hyperlinking features to address needs of complex integration scenarios.

KISTERS is a worldwide growing IT-company founded in 1963 as an engineering agency. Its 500 employees develop resource management systems for energy, water and air, and information systems for the area of environment protection and safety.

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Weldability-Sif celebrates 90 years

Weldability-Sif, the UK-based "one stop source" for all welding products, has a heritage dating back to 1925 and this year celebrates its 90th anniversary with a history that includes the origins of the bronze brazing process. For almost a century, the company has been involved in the innovation and development of welding products, and has supported the industry with technical assistance and consistent product quality.

Sifbronzing, named after the supplier of top-quality welding rods, wires, fluxes and equipment that first developed and promoted the technique, is an almost universally recognised way of describing the low temperature bronze welding of sheet steel, cast iron and other metals.

In 1914 a young man called Louis Tibbenham took on part of a factory in Stowmarket which had gone bankrupt, and set up his own company, the Suffolk Iron Foundry, to make castings such as flywheels and ploughshares. Just as the business got going, the Great War started, the bank-rate went up and business ground to a halt. It looked as though the company was doomed.

However, Louis struggled on, picking up small contracts and learning, in many cases by bitter experience, about business. At one stage, having built up a good trade in ploughshares, he signed a contract that, as he discovered later, forced him to stop making them. So he turned to making mangles, before the age of the tumble-drier, an essential part of every household's washing equipment.

By the end of the Great War the company was doing well. It had grown too big for its premises and so another site, some six acres of bog and rubbish tip by the River Gipping in Stowmarket, was bought for £500. The railway company provided a siding close by and work began on the site.

The whole site was planned by Louis, who also designed the buildings, resulting in his winning first prize in a competition run by the Foundry Trade Journal. The new factory coincided with a major contract that took up nearly all the foundry's capacity and then, in the form of having too many eggs in one basket, disaster struck and the contract was cancelled. Louis had to find something to fill the void and so he decided to turn to specialist castings. Prime amongst these was the lawn mower, soon to become recognised as the 'Suffolk' range.

Though casting and iron-founding was a major part of the business, Louis had always been interested in welding, and during the Great War he had met a young engineer in London who was experimenting with welding cast-iron using an oxy-acetylene flame. Suffolk Iron Foundries was asked to supply a few cast-iron rods containing extra silicon. They performed so well that they became a production item in due course, under the brand name, 'Super-Silicon Rod'.

At around this time Louis learned of the techniques of low temperature bronze welding for cast-iron, so he developed a rod which, subsequently was found to be suitable for welding virtually any metal except aluminium. Taking the initials SIF from Suffolk Iron Foundry, and adding 'bronze', he gave a name to the technique and formed a division to handle the products. The name Sifbronze has forged a important name in welding ever since.

Developments in welding in the 1960s were such that new techniques like semi-automatic MIG-welding were introduced and with them the requirement for new, high quality materials. At this point Sifbronze introduced SIF-Mig consumable electrode wire, a shaved aluminium wire to help ensure consistent, high-quality welds.

In 2007 the company was merged with Weldability and today it trades as Weldability-Sif and continues to grow and support its customers worldwide. During 2015 the company will launch three new product ranges as well as its purpose designed Welding Process Centre.

Weldability-Sif is a multi-million pound company operating from purpose built facilities in Letchworth Garden City, supplying MIG, TIG, MMA, spot and oxy/fuel welding and plasma cutting machines, torches, accessories, consumables and personal protective equipment to both the UK distributor market and exporting to a number of countries around the world.

From here, distributors can single source over 7,000 different products in order to maintain their stock of high volume consumables, including the distribution of over 8,000 tons of MIG welding wires per annum to the UK market.

Extractability launches groundbreaking ProtectoSpark

Extractability, a division of Weldability-Sif has introduced ProtectoSpark, a groundbreaking new product for the UK

market and one that is proven to prolong the life of filters.

Ready to use within minutes, ProtectoSpark provides spark protection for the ProtectoXtract welding fume extraction unit and can also be retrofitted.

Consisting of two components, it features the baffle plate and the collecting tray. Using the ProtectoXtract welding fume extraction unit the polluted air is sucked in via extraction elements and taken inside the filter unit via the air intake. There the air hits the baffle plate and is led along the baffle plate towards the collecting tray. At this point air deflects by 180°, getting into the particle filter. Induced by the deflection the bigger particles, as for example extinct spark particles, fall into the collecting tray and stay there.

Collection and removal of dust could not be simpler, just open the maintenance door on the front and remove the dust collecting tray. Without the ProtectoSpark much of the Welding fumes would have hit the filter directly and greatly reduced its lifespan.

Instead thanks to the ProtectoSpark the particles can be disposed of easily and simply according to their risk classification.

New one arm ProtectorReclenz mobile fume extractor

Extractability has also launched the DGUV/IFA (Institute of Occupational Health Standards) approved ProtectoReclenz mobile welding fume cartridge filter unit. The mobile welding filter is compliant with DIN EN ISO 15012-1: 03/2005 and is suitable for category W3 stainless welding fumes (>30 percent Ni+Cr). This mobile unit weighs only 130 kg and is supplied on swivel castors for manoeuvrability

The unit is a heavy-duty, long-lasting mobile welding fume extractor for use with unalloyed steel, precious metals, galvanised material and aluminium, perfect for places where large amounts of fume are generated.

The ProtectoReclenz features a durable large surface area filter cartridge of >99 percent efficiency, complete with audible and visible filter monitor, rotational direction indicator and hour metre. Because this is cleaned manually, quickly and easily, with compressed air and whilst remaining within the unit, the ProtectoReclenz generates minimal follow up costs and makes sure no dust can reach the working space. The unit is capable of handling up to 3000 m^3/hr and is complete with a 150 mm diameter hose type arm that is easily set into any position and complete with an internal support structure. The unit has a 1.1 kW fan set and is supplied with a 5m mains input cable and plug. The unit's outside dimensions are 665mm x 820mm x 1365mm and its noise level is approximately 70 dB (A).

There are a number of options to go with the ProtectoReclenz including 2, 3 or 4 metre long arms at both 110 v and 230 v. Also available are replacement filter cartridges and pre-coats for filter cartridges.

ProtectorSpark and ProtectoReclenz are available from stock for next-day delivery.

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Fronius on remaining state-of-the-art

At the cutting-edge of manufacturing specialist state-of-the-art welding technology for 70 years, Fronius is the name that links welders all over the world. For decades Fronius has made significant contributions to advances in welding technology and has become global technology leader in the field of arc welding.

Over the years, Fronius has launched innovation after innovation, including last year's launch of the world's first cordless MMA and TIG welding machine with an integrated rechargeable battery. The company reinvests 5-10 percent of its turnover into the development of its products and employs over 400 dedicated engineers in R&D, housed in an impressive new facility in Austria.

Local service and capabilities

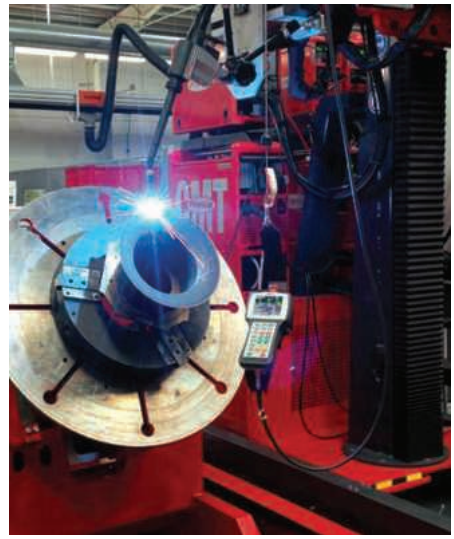
The solutions-driven manufacturer has been fully operating in the UK since 2012 from its Technology Centre in Milton Keynes. This houses the TechSupport team, a repair centre, warehouse and training area, and epitomises the importance of being able to deliver a first-class service to customers. In addition, customers benefit from services such as calibration, warranty extension and maintenance contracts.

A second facility in East Kilbride has expanded the company's presence over the last year, providing a more localised service to Scottish customers. Further regional facilities are planned as part of the company's goal to be no more than four hours from any of its customers.

Technology

Fronius provides solutions for manual welding (MIG/MAG, TIG, MMA and Plasma), robotic welding and also has a huge portfolio of automation equipment. Confident that it can help with any welding requirement, however large or small, Fronius recognises that customers are looking for more cost-effective ways of welding and that technology needs to be simplified so that semi-skilled people can learn to use the systems so the industry can move forward. Fronius offers both technical support and training in this area and believes these are examples of its core strengths adapting to the needs of the market.

Fronius equipment can be found in all areas of industry from shipyards and



offshore rigs, for which the brand carries an entire specialist range to one of its core markets the automotive sector.

Fronius sees a trend within the automotive market towards the use of aluminium for lightweight construction, as well as higher strength steels and coated materials. The right technology needs to be on hand to weld these materials properly to get the correct results and Fronius has just the process to do it Cold Metal Transfer. Bespoke to Fronius, CMT is a "cold"MIG welding process, developed originally for the welding of steel to aluminium. To put it more accurately, this process constantly alternates between hot and cold, leading to immaculate results and boundless possibilities such as spatter-free welding.

The level of control achieved at the arc is

significantly better than a conventional pulsed MIG machine, allowing the welding of different materials where you might normally use a different welding process. This enables increased production rates and provides a better weld quality, making it a popular choice for cladding, automotive and offshore industries.

Fronius is also prepared for the trend towards the use of robotics and automation in the UK, as alongside the rest of the world, the UK sees a decline in the number of skilled tradesmen and women. With a wide range of mechanised welding systems, from pre-developed standard components to complex system solutions to specifically match applications, Fronius has decades of experience in this field to give it a head start.

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Open House

Fronius UK opens the doors to its Technology Centre in Milton Keynes on 15th April 2015, providing engineers and production managers with a fantastic opportunity to explore the technologies and processes designed to increase weld quality, whilst enabling faster welding speeds. The day will encompass a vast range of demos and presentations from technical experts in the industry with guest speakers from Airproducts, the TWI and Voestalpine-Bohler.

Highlights include a completely new approach to MIG/MAG robotics welding with TPS/i robotics, additive layer manufacturing and the second generation Fronius DeltaSpot, a resistance spot-welding system that uses a spooling process tape.

Book a free demonstration at your own premises or arrange a visit to the Technology Centre. The Open House on 15th April is open to everyone. Doors open at 10am. Register via email to info-uk@fronius.com or call 01908 512 300.

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Battery tab welding technologies

Spot welding strips and tabs onto batteries in order to make battery interconnects and larger battery pack assemblies is a mature production methodology. Despite year on year improvements in the battery performance and build technology, it is surprisingly quite common to find manufacturing equipment and processes dating back many years if not decades, being used to manufacture state-of-the-art, high integrity batteries and battery packs.

Commonly, limitations in the equipment, process understanding and/or product design create unnecessarily, and often unquestioned, high levels of scrap and quality issues, sometimes even negating some of the benefits associated with the chosen battery technology.

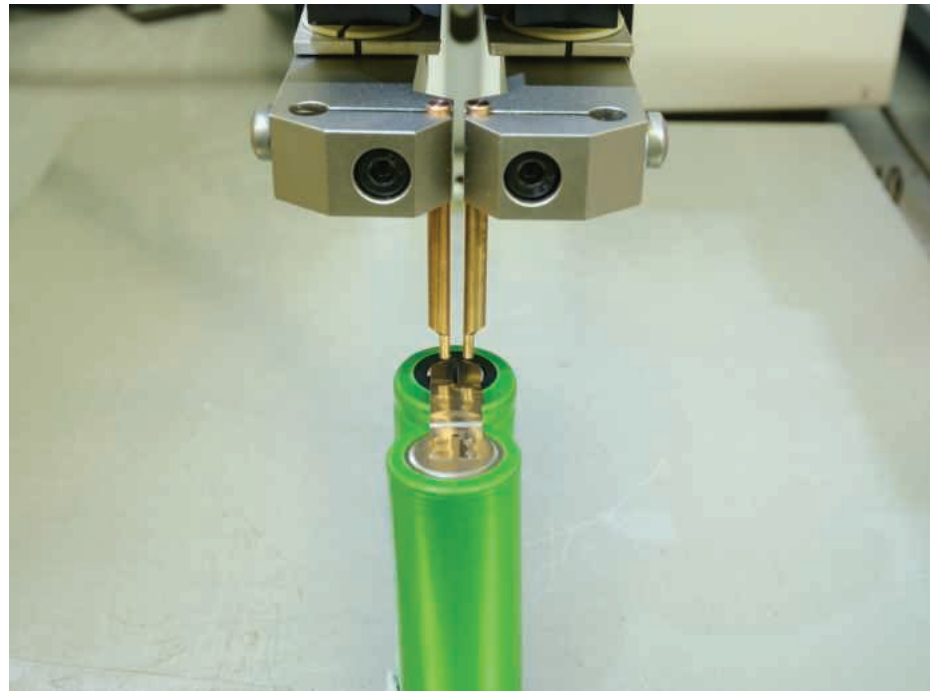
More often than not, battery tab attachment to batteries is carried out using a parallel gap welding technique in which the weld area is accessed from the same direction with both electrodes. The method is broadly as follows:

When the weld starts, the majority of the current flows though the material in contact with the electrodes and since current always follows through the path of least resistance, the current flow will initially be through the upper tab material and hence will not contribute to the welding.

As this material heats, the tab material resistance increases relative to the contact resistance between the upper and lower materials, thereby creating a preferable path for what will be the welding current, and which now begins to flow through the tab to battery interface and then back through the other electrode. Because there are two potential current paths during the process, the electrical and mechanical dynamics must be considered in order to best define the welding current through the joints to achieve reliable and repeatable welding.

Clearly anything affecting current flow can influence the weld and thus should be considered, with the most common falling into the following categories: part-to-part material interface; electrode resistance/contact area; current control is critical.

With parallel gap welding, the gap between the electrodes is typically less than 1 mm with both electrodes contacting the same part. Series welding involves the same



geometry and principles as parallel gap welding but has an electrode gap greater than 2 mm. Welding current flow through the tab and battery can materials is accomplished through the variation in material and interface resistances as the weld occurs.

Generally the best way to define a part to part interface is to design in welding projections into the battery tab material. These are usually punched domes that act as a point of higher initial electrical resistance which concentrates the welding heat.

With resistance welding we want to define our welding current which from ohms law (V= I x R), means we want to define our paths of electrical resistance. Our heating source comes from the flow of current and is proportional to the circuit resistance and the square of the current.

Since battery tabs and battery cans are relatively conductive, we need high currents in order to generate heat from low resistance (Power = I^2R). That said, if we inadvertently introduce a high resistance in to the circuit, then suddenly we have large amounts of power and higher voltages, i.e. if the R goes up in V = I x R, then the voltage goes up, unless we are using a closed loop control power supply, which means a higher likelihood of sparking and product damage.

Similarly from Power = I^2R, if the R goes up, then the instantaneous power goes up, again unless we are using a closed loop control power supply, which means a higher likelihood of sparking, electrode damage and product damage.

Electrode sparking is obviously undesirable as it means material expulsion either from the electrode, the product or both and hence should be minimised or removed altogether to ensure a consistent process. This means taking measures to counteract the sources of high unwanted resistance. For example, if our electrode tips are dirty or worn, or our product finish is rough or contaminated, we shouldn't be surprised if this leads to sparking.

Battery tab welding - Key Interface

As welding current begins to flow, the projection will heat and collapse in a defined localised area. As can be seen from the photo, projections can be used with flat ended electrodes. Flat ended electrodes are generally cheaper and easier to re-grind and since the pressure is spread evenly, they tend to last longer. It is also worth noting here the use of a bi-furcated strip in the photo. This serves to significantly reduce the initial current flow from electrode to electrode through the tab material - hence more current is concentrated through the tab, through the can and back via the other electrode.

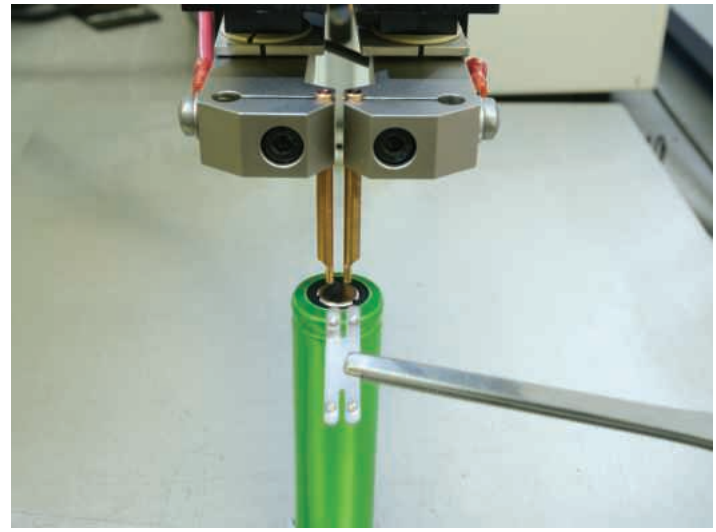
Compromises to this general setup are usually based upon design history and

occasionally cost. It is also quite common to try and use the same weld head setup for a variety of part to part setups which are essentially electrically different. For example, stacked tabs versus a single tab. In such cases, dynamic flexibility in the welding power supply is generally a pre-requisite for consistent quality as a means to counteract the electrical differences in setups.

As we have seen, there are plenty of mechanical process variables that can conspire to spoil the quality and consistency of parallel gap welding battery tabs. Good practice and design should be applied wherever possible to minimise the effects on the electrical circuit. But what of the welding current itself, do we have this under control?

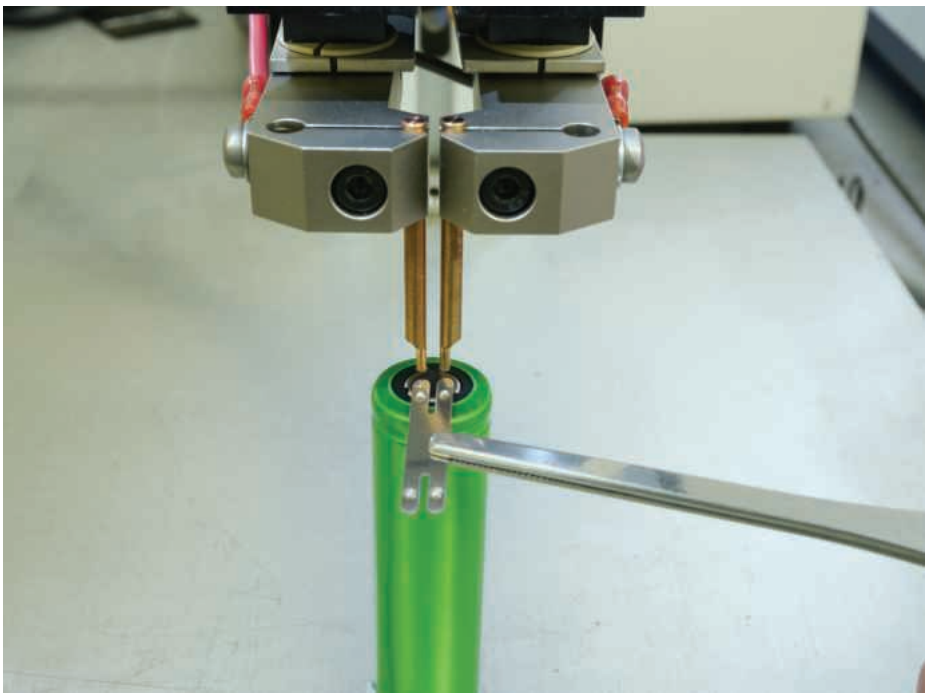
As with most things, there is a price to pay and a spectrum of choice. In the earlier days of battery pack manufacture, capacitor discharge based welding supplies became prevalent due to their ease and simplicity of build. These units essentially are programmed to store up a pre-set level of electrical energy in an electrical capacitor and then to release that energy into the welding circuit at the point of weld trigger.

This is known as open loop welding, as the current flowing in the circuit is determined by the circuit resistance / electro-mechanics as described above. If, as we have seen, the electro-mechanics can change, so therefore can the welding current and thus the weld integrity. With advances in electronics, closed loop welding supplies have been developed to compensate for these capacitor discharge shortcomings, offering significant benefits in terms of quality and process tolerance.



Commonly, where projections are not used, dome ended electrodes are used instead of flat ones in order to focus the welding current. Alternatively, small diameter flat electrodes may be used as a current focus point. The shape of the electrode in combination with the welding pressure act to simulate a projection in reverse and as such, these parameters tend to become more critical and process intolerant compared to projection welding. In single head situations where a head is used for various battery tab joints and where tabs may or may not be stacked, this approach can lead to significant compromise. Again, countermeasures can often depend upon the capability and sophistication of the welding power supply to adequately compensate for these real world process variables.

The electrode contact area should also be considered as part of the dynamics of the weld as it takes place. As material melts at high speed during the welding process, it is vital that the weld head is able to maintain the electrode in consistent and repeatable contact with the product. Failure to do so can lead again to high spot resistance and hence sparking. This means low inertia, low friction precision weld head mechanisms with repeatable force setting. With parallel gap welding, it is often convenient to provide two independent welding modules with independent force settings to allow provision for additional force compensations to be made at each weld, counteracting material flex and polarity effects.



A closed loop power supply offers the ability to control the welding current in real time and in reaction to the circuit resistance it encounters. Furthermore, the rate at which the current is applied to the circuit may also be accurately programmed. For good welding, we want the current to rise as fast as possible to make good use of the the circuit resistance as a source of heat and to minimise the overall energy going into the product (critical for potentially explosive batteries!). That said, if we go too fast, our current will rise faster than the thermal changes in the product and we can develop thermal runaway, a high resistance spot and thus sparking at the electrode or holes in the product. In other words, part of our welding current strategy is to match the thermal dynamics of the materials involved. For example, if we weld a tab to a battery, we may optimise at a certain current rise (warm up) and current fall (cool down) period.

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Nederman launches new media filtration system

To control light airborne dust/smoke in potentially hazardous environments, Nederman has now developed its new MF 12-15 media filtration system. The cost-effective solution has been designed for free hanging applications to control light airborne particulate. The new MF12-15 units are ideal for applications that include the removal of diesel smoke, grinding dust, welding fumes and other airborne contaminants.

Considered a complete all-rounder for maintaining a high level of air quality in virtually all industry sectors, the MF12-15 has been designed specifically for indoor installation and must be protected from excessive moisture. The powerful new system has a 0.33 kW motor that efficiently draws airborne particulate through the fan and into the air cleaner. The contaminants flow through the filters located at the front of the unit. The cleaned air is discharged at the rear of the unit via a double deflection grill.

With an air volume of 2550 m^3 and a pre-filtration efficiency above 90 percent and a main bag filtration efficiency between 90-95 percent, the new MF12-15 guarantees to clean up the workshop. By employing this high powered system, the MF12-15 also maintains a high air quality in the workshop, which is beneficial to the health and wellbeing of staff. Furthermore, by removing particulate from the workshop environment, the MF12-15 contributes to a cleaner facility by drastically reducing surface dust.

The MF12-15 works with a standard 230 v supply that simplifies installation while the compact 1012 by 690 by 600 mm frame can be easily fitted with the Nederman range of mounting brackets. In addition, the MF12-15 is available with a media filtration indicator that enables the customer to monitor the efficiency of the filters. This ensures that the customer can maintain optimal air quality levels and monitor filter life with ease. The pre-filter and main filter units are easily exchangeable and Nederman holds considerable stock levels to ensure rapid delivery of the filters. As an environmentally conscious manufacturer, Nederman has developed the MF12-15 with an extremely efficient motor that provides maximum particulate removal rates with a remarkably low power consumption that keeps running costs to a minimum.

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Clamping and welding tables win two silver awards

Bernd Siegmund GmbH has participated in an American design-competition for the first time and promptly won two silver awards. German manufacturer Sigmund entered its 'Professional Extreme' clamping and welding table and the 'Alu-Titan 800 GK stop and clamp square table. These are now both available in the UK from Birmingham-based Surtech.

At the International Design Excellence Award (IDEA), one of the most important Design Awards in the USA, the clamping and welding table and the stop and clamp square table both won silver awards in the 'Commercial & Industry Products' category. The Chicago award ceremony was attended by Daniel Siegmund, the junior manager responsible for international distribution. Having only just entered the US marketplace, Daniel Siegmund is naturally delighted with the immediate recognition for these outstanding new product innovations: "The award will help us to promote and demonstrate the capabilities of our products in this new market sector.

Furthermore it is an indicator, that our products meet the requirements for the US market. The Americans want tools that are hard, indestructible but also offer an extremely appealing design. We can offer that."

"On top of the IDEA award, we have also won the 'Red Dot' Design Award for the Professional Extreme in the 'highest design quality' category. This confirms the company's approach to combine top-quality with functionality and good design," he concludes.

The Siegmund Group is a global acting company of clamping and appliance systems and producer of machines and machine-parts. The family enterprise offers products for the machine, plant, metal and vehicle industries under the brand name "Siegmund". Siegmund tables are used in both prototype construction and in serial production, with or without robots. Siegmund is the world market leader in the market segment of precision welding tables".

Parent company Bernd Siegmund GmbH is located in Großaitingen near Augsburg. Two production facilities are in Baden-Württemberg and two in Poland. Overall, the company employs around 200 people. In 2012, the Siegmund Group had its 30th anniversary.

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Prima Power laser welding opens new horizons

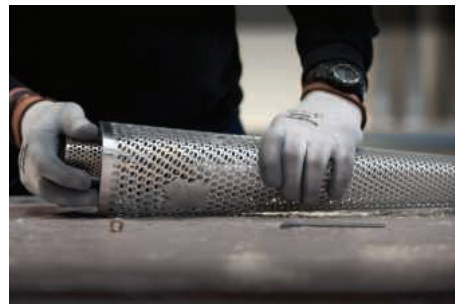
Laser welding has some significant advantages and Prima Power's expertise in this field can help companies re-evaluate production methods to produce higher quality products while at the same time reducing manufacturing times.

Two types of welding are possible depending on the application, deep penetration welding and heat conduction welding.

With deep penetration welding, thick materials can be joined, as the laser beam heats up the material until it vaporises. The laser energy is then concentrated in the void formed by the vaporised material, minimising the reflection of laser power and producing a narrow keyhole of melted metal with a high ratio between depth and width. Once this stage is reached, the speed of welding can be up to around 6 m/minute and, depending on the power of the laser, up to around 8 or 10 mm deep or more.

For heat conduction welding, weld depths are generally less than 2 mm deep and the width of the weld is wider. This process lends itself to joining thin materials such as sheet metal, tubes and foils.

For both types of welding there is no need for a filler, as the process fuses the host material directly. However, the complication is that a close tolerance gap of less than



0.1 mm is needed between the edges to be joined.

The Premier Group based in Coventry, used laser welding for the first time during the manufacture of the torch for the 2012 London Olympics on its Prima Power Optimo laser. The requirement was to seam weld down the length of the torch to produce an invisible joint which could then be pierced with holes to match the rest of the design.

To achieve the close tolerances required, engineers at The Premier Group devised a purpose built automated fixture with a series of hydraulic gripping fingers. These forced the edges of the torch together as welding progressed, rather like a zip fastener, producing a gap small enough between them to enable successful welding of the joint. Process repeatability and quality were highly important for this project due to its high profile nature and the quantity of torches produced for the games.

As well as the speed and quality of the welds, laser welding has some further significant advantages. Because of the nature of the laser welding process, which has a relatively low heat input compared with arc welding, the heat affected zone is very small, which helps to reduce distortion in the component to a minimum and, the process is non-contact, eliminating the possibility of displacing components as they are welded. Furthermore, laser machines such as the Prima Power Optimo have multiple axes, enabling highly complex weld paths to be programmed in 3D. This allows users to weld together intricate assemblies of parts while achieving high levels of repeatability and accuracy, making laser welding a process ideal for products demanding quality and precision.

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Addison machining centre is the clear choice

Crittall Windows Ltd, Britain's leading manufacturer of steel windows and the second largest supplier of steel windows in the USA, has purchased a new MECAL CNC machining centre from West Midlands-based cutting and sawing technology specialists, Addison Saws Ltd.

Valued at £140,000, the machining centre, a MECAL MC 305 Gianos 5-axis twin table model, will boost Crittall's production capabilities and efficiency. Installed in January 2015, it will also bring new levels of flexibility to machining operations across the entire range of windows produced at Crittall's manufacturing centre in Witham, Essex.

Capable of machining steel components

"We had been looking into the benefits of investing in a CNC machining centre for quite some time," says Crittall's head of manufacturing, Steve Gaylor. "However, as many CNC machines are designed specifically for the production of lightweight aluminium profiles, our challenge was to find a model capable of working with steel components of up to 5 mm in thickness."

Multi-axis capability

To remove any need for machined components to be turned manually during the manufacturing process, Crittall required a multi-axis machining solution. While due to the specialised nature of its products, and to both accelerate and simplify new product development, the machining centre also had to be highly versatile, with multi-tooling capability.

"Although we spoke to a number of potential suppliers, it was Addison who seemed genuinely interested in meeting our requirements," adds Steve Gaylor. "They provided detailed machine information, arranged manufacturing trials and assisted with cutting tool development."

Dual machining zones

Crittall selected the MECAL MC 305 Gianos from Addison Saws for its capability to machine a full range of hot rolled steel sections. Its 5-axis operation will allow the windows specialist to machine multiple section faces without the need to manually turn components during the manufacturing cycle. Additionally, as the MECAL machine is equipped with two separate machining zones, it can be loaded and unloaded without halting the manufacturing process, a vital advantage in terms of maximising productivity.

Highly robust and user-friendly

"We're delighted with our choice," says Steve Gaylor. "The MECAL machine is highly robust and benefits from an exceptionally user-friendly control system that inspires operator confidence. We now have a solution that will bring greater flexibility to our production capabilities, reduce manufacturing lead times and assist with new product development. Perhaps most importantly, the MECAL delivers the accuracy and repeatability that are synonymous with the Crittall name."

Supporting major order from USA

"Both Addison Saws and MECAL have been incredibly helpful throughout the process, from arranging the machine trials before we made the decision to purchase, to providing first-class operator training once the machine had been installed. We have recently secured a major order to fabricate new windows for one of the most well known universities in the United States and are confident the MECAL MC 305 Gianos will play a major part in helping us to fulfil that order."

The MECAL MC 305 Gianos machining centre chosen by Crittall Windows is equipped to automatically machine, drill, mill, slot and prep both aluminium and steel extrusion bars.

Providing immense flexibility, it is also well suited to new product development, while its high levels of accuracy and repeatability ensure minimal waste.

Established in 1956, Addison Saws Ltd. brought a new breed of metal cutting solutions to the UK and, in doing so, created a whole new market for bandsaws and circular saws. Today, almost sixty years on, Addison Saws Ltd. continues to lead the way in metal cutting technologies and offers an extensive range of full CNC machine tools, from the world's premier industrial machine manufacturers, all supported by uncompromising levels of customer care. The Addison Saws Ltd. product range includes everything from simple, manually operated machines to highly sophisticated, fully automated sawing lines and has recently been increased with the addition of heavy duty 3, 3+1, 4 & 5-axis long-bed multi-piece machining centres. Addison Saws Ltd. is part of the Addison Group, an organisation that also includes sawblade re-manufacturing specialist Dynashape Ltd., and tube-bending technology specialist, Tubefab.

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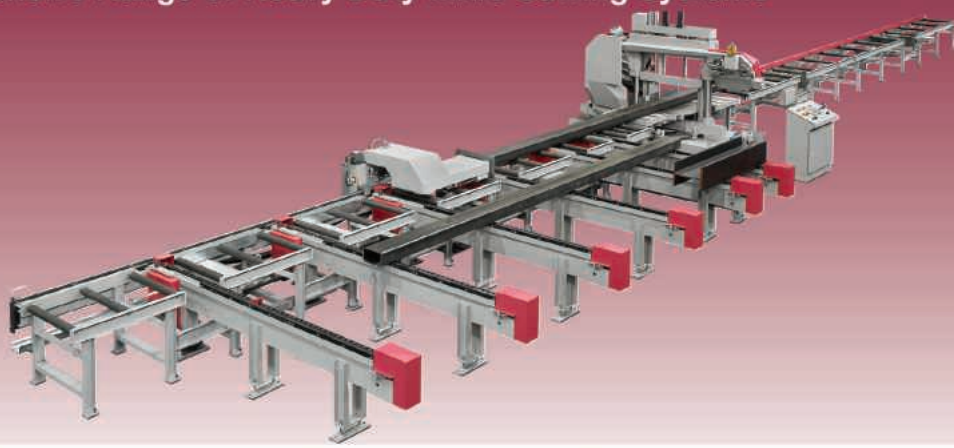

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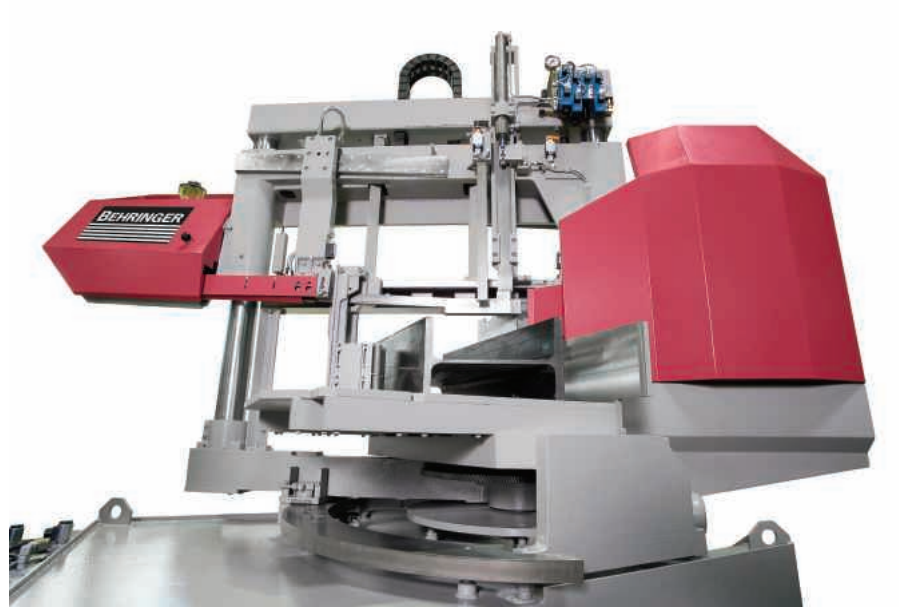
New mitre bandsaw machines grow in step with requirements

Who is able to say with any certainty today what they will be called upon to machine tomorrow? Not a problem with the new, high-performance bandsaw machine HBP410-723G and the somewhat larger HBP410-923G from Behringer. Benefiting from consistently implemented platform technology in conjunction with a no-compromise modular design, both these two machines are true quick-change artists.

The new models are designed to cut sectional steel and solid metal materials as well as comparable plastics. With a cutting range of 410 mm in round material and 700 x 400 mm (900 x 400 mm) in flat stock, as well as a bilateral mitre from 45° on the right to 30° on the left, these machines are an indispensable asset for a wide range of different sawing operations.



The pivotal positioning of the sawing unit for angular adjustment takes place using two generously dimensioned bearings. The unit can be precisely swivelled to the required position with a simple rotation movement. (An NC rotation feature is optionally available). The pivot point is located at the intersection between the bandsaw blade and the material contact edge. This ensures that the measurement reference line remains constant.

The proven dual-column saw frame guidance system offers unbeatable benefits in terms of effective vibration-damping, an attribute of extreme importance when cutting materials with widely different cross-sections. The saw frame with its 3° incline is also designed to produce perfect cutting results, for example when machining girders with extremely wide flanges or square hollow profiles. A fully automatic saw frame height adjustment facility depending on the material height, and saw lowering in rapid traverse help drastically cut down on machine downtimes in automatic operation.

A combination of roller guides and backlash-free pretensioned carbide slideways also ensures reliable running of the saw blade in the material stock. The movable, vibration-damping saw blade guidance can be simply adjusted in line with the kerf width by the material gripper. Saw blade clamping is hydraulically powered. Both constant cutting feed and a consistent cutting force for pipes and sectional material guarantee optimum service life of tools and precise offcuts coupled with high cutting output.

The machine's development engineers paid particular attention to ensuring user friendly design of the new mitre bandsaw machines. All routine sawing-related activities such as clamping the material or sawing different angles, have been streamlined and simplified. Suggestions for the improvement of maintenance and servicing have also been considered and put into practice.

A high-powered microspraying system is recommended for sawing work involving sectional material and girders. This is provided in the new HBP410-723 and –923 models in place of a flush cooling system. The system is equipped with two delivery pumps and spray heads as well as a fluid level monitoring system.

A wide range of optional upgrade possibilities make the HBP models an invaluable asset in day-to-day sawing operation. They are available with features such as NC rotation, automatic guide arm adjustment and a vertical clamping fixture (included as standard in the delivery scope of automatic mitre bandsaw machine). It is even possible to integrate an optional double vice into the machine.

Behringer also offers an extensive range of peripheral devices, starting from infeed and outfeed systems in different lengths through measurement systems to cut monitoring systems. Cutting pressure measurement on the movable bandsaw belt guide, which is extremely useful when sawing large profiles, is also optionally available.

The dynamic way to saw

The new HBE Dynamic series from saw specialist BEHRINGER delivers impressive performance, user convenience and economy.

Behringer presents its new HBE Dynamic series as the answer to ever growing market demands for more efficient, more economical and more precise sawing machines. "Increased performance coupled with reduced energy consumption, a smaller footprint, and improved occupational safety without compromising handling simplicity were only part of the product brief for the development team working on this new machine", recalls CEO Christian Behringer. Available in four model types, 261, 321, 411 and 511 with corresponding cutting ranges, the new HBE Dynamic series will cover a broad application spectrum for the steel trade, for mechanical engineering, tool making and for high-end metalworking shops.

Impressive economy and minimised noise

With an outstanding tool life of over 400 sawing cuts in 200 mm dia. 42CrMo4 material, for instance, the new HBE261A Dynamic performs well above standard, taking even the most stringent demands easily in its stride. Playing a key role in this achievement are proven Behringer features such as further improved cutting pressure control, which consistently helps prevent tool overload. A stable saw frame made of vibration-damped grey cast iron and double-sided bearings for the band wheels take care of minimised noise and optimum cutting precision. Tests have revealed increases in tool life of up to 30 percent, with a visible improvement to the quality of cut surfaces. The inclined position of the band wheels also helps protect the bandsaw blades as a result of reduced flexural stress.

No-compromise energy efficiency

Production using minimal resources and efficient, sustainable use of energy are recurring themes which are constantly in the news. Rising energy prices mean that companies are having to rethink their existing processes and develop innovative technological solutions to achieve higher output with lower energy input. "With the new HBE Dynamic series, we are proving that energy efficiency and high-performance hydraulics are not a contradiction in terms", says Christian Behringer. With the use of state-of-the-art frequency-controlled drive systems from renowned manufacturers and application-oriented gear speeds, a simple kW motor output specification is no longer any guarantee of high cutting output. In the HBE 261A Dynamic, for instance, a saw drive with 2.6 kW permits high machine throughput coupled with a low energy requirement, resulting in efficient production.

Functionality and design

The new full machine enclosure not only ensures compliance with the latest CE guidelines, it also addresses growing demands for user convenience, occupational safety and environmental protection. The benefits speak for themselves: The work environment stays clean, noise is minimised while a large observation window affords an excellent view of the machine. The easy-maintenance concept allows simple saw blade changeover and easy access for maintenance and cleaning work.

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The name says it all

The RAPID from FICEP is a new CNC high speed drilling line for angles and flats offering high productivity, quality, flexibility, accuracy and lower production costs. The machine's powerful spindles with their high rotational and feed speeds, together with the new generation high performance tools, enables the use of cost efficient Indexable Carbide Drilling tools to further enhance productivity.

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

The two drilling heads are equipped with very powerful direct drive spindles and an automatic tool changer with 6 positions for each of the spindles. The CNC system controls spindle positioning and feed rates and linear guides with controlled servomotors and ball screws ensure maximum precision on every axis. A new additional auxilliary axis of 200 mm allows independent control of the two spindle in the length or "X" axis. The independent movement of the two auxilliary axis while an angle is stationary, maximises the productivity achievable with each spindle within the stroke.

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

Optional hard stamping CNC marking units have 8 selectable cassette types, each one including 13 characters.

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

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

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

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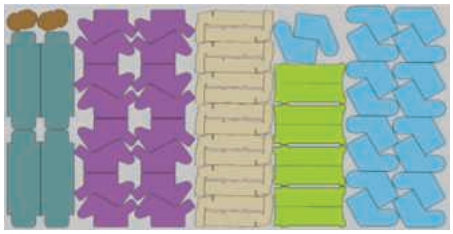
A world of cutting and bending solutions

With ByOptimizer, Bystronic presents an exclusive online service that provides users with optimised cutting plans in the twinkle of an eye. It enables users to save raw material and shorten their cutting times without requiring complex programming or specialised knowledge. ByOptimizer is based on a newly developed cluster technology from the Swedish company Tomologic. The patented technology automatically groups the parts to be cut on the metal sheet, so closely that the gaps, i.e. raw material waste, are reduced to a minimum.



ByOptimizer also increases the reliability of the cutting processes, as it factors in all of the components that are decisive for the cutting job: the geometry of the cut parts, the characteristics of the raw material, and the power of the laser. During this process, a database including more than 300 parameters provides comprehensive information about the material behavior and ideal cutting paths.

Compared to conventional cutting plans, ByOptimizer achieves material savings of up to 15 percent on a standard-sized metal sheet of 2 by 1 metres. For example, a cutting job with approximately 60 parts, for which the conventional programming method required two metal sheets, ByOptimizer manages to group so efficiently that all the parts fit on just one sheet. This not only saves material but also setup time, because with this cutting job there is no need to load a second sheet.

In order to benefit from ByOptimizer, users only require a PC with an internet

connection, BySoft 7, and a laser cutting system from Bystronic.

Bystronic is also expanding its Observer remote monitoring system. Until now the system was available only for laser and waterjet cutting systems. Now users can also use the Observer with pressbrakes.

With the support of cameras, Observer enables remote monitoring that keeps users up to date about the operating status of their systems and about how the processing of orders is progressing. Observer is accessed using Web-enabled terminals, such as notebooks, tablet computers, and smartphones. With Observer, users increase the process reliability of their cutting and bending systems.

Bystronic has equipped its BySprint Fiber with a new 6 kW fibre laser. Most importantly, this enables even faster cutting speeds. The Cut Control function also ensures process reliability.The new laser source is available for the BySprint Fiber 3015 and the 4020 format version of the machine.

The 6 kW laser considerably increases the BySprint Fiber's cutting speed in the thin to medium range of sheet thicknesses. For example, in 3 mm thick stainless steel by up to 70 percent compared to the 4 kW fibre laser.

The speed advantage is even more pronounced compared to the 6 kW CO_2 laser. In 3 mm thick stainless steel, the new fibre laser is three times faster. Depending on the material and the sheet thickness, the parts output can thus be increased by up to 300 percent.

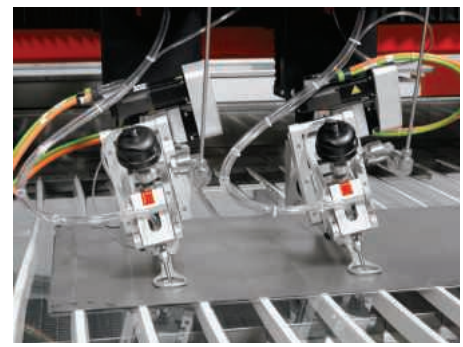
With the 6 kW laser's high cutting speeds, process reliability becomes more important than ever. Bystronic has therefore equipped the 6 kW version of the BySprint Fiber with the tried and tested Cut Control as a standard function.

Cut Control monitors the cutting process. When a cutting tear occurs, Cut Control automatically stops the laser. Subsequently the cut is repeated. This allows the user to reduce the risk of miscuts.

High quality cuts in sheet thicknesses up to 30 mm are now possible thanks to the Power Cut Fiber option, which Bystronic is also offering for the BySprint Fiber laser cutting system.

To date, high-quality cuts in stainless steel using a fibre laser cutting system were limited to a maximum sheet thickness of 15 mm. With the new Power Cut Fiber function, users can now achieve extremely fine cutting quality with material thicknesses up to 30 mm.

Power Cut Fiber also increases the previously maximum range of thicknesses that can be processed with applications in non-ferrous metals, aluminum and mild steel. With Power Cut Fiber, users can cut brass up to a thickness of 15 mm, mild steel up to 25 mm and aluminum up to 30 mm, while maintaining impressive quality.



The Power Cut Fiber option is available on the BySprint Fiber 3015 and the BySprint Fiber 4020 with a minimum of 6 kW.

With the new ByJet Flex waterjet cutting system, Bystronic is equipping its customers for the future. The machine platform provides a variable basin system and an individually expandable range of functions.

In addition, with the ByJet Flex, both 2D and 3D applications are now possible. The machine operates with two convertible cutting heads, which can make straight or beveled cuts, depending on the application.

The ByJet Flex's machine concept is based on the successful ByJet Classic series. With the variable basin system, the ByJet Flex is available in several formats up to a maximum working area of 10 by 3 metres. It is also possible to expand the system at a later time.

The basic version of the machine is equipped with all the technical prerequisites that allow it to be upgraded with extended functions such as 3D cutting heads, drill spindles, FixMaster and PositionPointer. The ByJet Flex enables users to select from a modular system to define a machine that is precisely tailored to their requirements.

The newly developed process control on the ByJet Flex supports the broad spectrum of applications and improves the integration of all the processes. The process control makes itself felt during 2D processes by providing high-quality cuts. Initial and final cuts, fine contours with frequent changes of direction and corners in thick material can be processed with extraordinary precision. With 3D applications, the new control enables simultaneous 5-axis cutting with two cutting heads and continuous height sensing.

Turn on and bend

With the Xpert 40, Bystronic presents a new pressbrake with a compact design. The innovative speed-machine enables users to bend small parts fast and cost-effectively.

The Xpert 40 will be launched on the market in 2015 and will round off the range of pressbrakes in the small machine segment.

The new pressbrake convinces primarily through speed. The innovative lightweight design provides the Xpert 40 with a high level of dynamics at bending speeds up to 25 mm per second. This means that the Xpert 40 bends small parts up to three times faster than larger pressbrake models. Over a bending length of one

metre, the Xpert 40 generates a press capacity of up to 40 tons. The ByMotion drive control, a new Bystronic innovation, ensures the finely tuned interplay between speed, precision, and power. The control coordinates the precise acceleration of the upper beam and the back gauges. This enables bending results with the highest degree of repetition accuracy.

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Retailing ambition at JC Metalworks

As the oft-used idiom states, mighty oaks from small acorns grow. Few fit this phrase better than Loughborough-based JC Metalworks. Started by Jack Chauhan in his garage in 1986, it has taken less than 30 years for the company to grow into a £5.3 million turnover, 72-employee, 60,000^2 ft enterprise.

Like many, JC Metalworks offers an in-house solution for all sheet metal subcontracting requirements, from design and precision engineering services through to product manufacture, assembly (including electrical work and the fitting of non-metal elements such as wood and glass), and delivery. However, the company's differentiating factor, and the secret behind its unerring success is its carefully planned, ongoing investment in modern, automated manufacturing equipment. It is this that enables JC Metalworks to be flexible and highly responsive to customer needs. In combination with three other founding principles, customer service, investment in people and development of processes, this family-owned and run company has gone from strength-to-strength.

Point-of-sale is the main market served by JC Metalworks, which accounts for 85 percent of business. Over the years, the company has become an expert in retail markets, understanding the sector's products, lead-times and quality requirements. Retail shelving and racking for products such as confectionary, beauty products and tobacco are among core business. Needless to say, laser cutting is a primary process, which is why the company's most recent investment is an FOL3015 AJ 4kW fibre laser from Amada.

"I always look to buy the best and fastest machine when I do my supplier research," says Jason Chauhan, the company's managing director and son of the founder. "We had an existing CO_2 laser from another supplier, but with 90 percent of our business involving sheet of less than 1.5 mm thick, it made sense to think about investing in fibre technology. After thoroughly researching the market and the machines on offer, we chose the Amada FOL3015 AJ. Many machines were considered, but Amada represented the best value for us in terms of manufacturing efficiency and automation. Amada also offers total reliability with regard to service."

Duly acquired, the FOL3015 AJ with MP-F automated load/unload spends around 80 percent of its time cutting mild steel less than 1.5 mm thick, although zintec, pre-galvanised steel, stainless steel and aluminium are also processed on the machine. Anywhere from 20 to 100 sheets are loaded at a time.

"It's a lot quicker than our existing CO_2 laser; probably two or three times faster, depending on the part," says Jason Chauhan. "However, aside from the speed, we are also experiencing enhanced cut quality, along with less maintenance thanks to features like automatic nozzle changing and cleaning."

The FOL3015 AJ represents high specification fibre technology from the diode to the workpiece. Both the machine and beam source are developed by Amada, providing perfectly synchronised components for optimum performance. Material processing is rapid, thanks to 340 m/min linear drives and 5G acceleration, while users can expect to save around 70 percent in energy running costs in comparison with a CO_2 machine.

"As well as eliminating the cost of outsourcing some of our previous laser cutting requirements, the machine has given us a real opportunity," says Jason Chauhan. "Not only have we generated extra capacity, some of which we still have to fill, but it's an excellent marketing tool. All of our customers who have seen the machine are really pleased to see that we're investing in the latest manufacturing technologies."

Working as a sub-contractor supporting retail agencies and their clients, often well-known and high profile high street brands, with their point of sale manufacturing requirements. It is crucial to JC Metalworks that all products are made to exact specifications and high standards, all while remaining competitive in the marketplace. With this in mind, JC Metalworks is now working with trusted partners in the Gujarat region of India, from where the Chauhan family originate, to undertake some of the company's metalworking processes.

"Having India on-board allows us to manufacture larger volumes on a competitive basis without affecting quality," says Jason Chauhan. "This will open up opportunities for our clients to support their brands globally, as cost effectively as possible, while still making the most of our team's skills and experience."

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TRUMPF confirms largest ever UK press brake order

TRUMPF UK says it has received its biggest ever order for CNC press brakes. No less than nine TruBend Series 5000 press brakes have been ordered by KMF, a leading sheet metal subcontractor based at Newcastle-under-Lyme in Staffordshire.

KMF has always recognised that investment in the latest technology benefits customers through quality, cost and delivery. Indeed, the company currently has numerous recently installed TRUMPF laser cutting and combination punching machines. However, until now, the company held preference for press brakes supplied by a different manufacturer. This changed after a review of five potential suppliers for the new machines. Keith Nicholl, business improvement manager at KMF, explains why they chose TRUMPF bending technology: "The decision to purchase the TRUMPF press brakes was taken after a number of reviews with our folding team. We examined the key elements and features that needed to be present in our production environment, which is strictly based on a made-to-order strategy, typically against small batch sizes and short lead-times."

According to Keith Nicholl, simplicity of setup, speed of tool change and repeatability came out as the principal driving factors.

"During trials, we found that the TRUMPF press brake could reduce a complicated multi-bend setup from 40 minutes down to less than five minutes. This, along with the confidence we have from our experience of using TRUMPF punch and laser systems, convinced us that this was the right choice for KMF."

"KMF are looking to ensure that the press brake does most of the technical hard work," says Paul Johnson, area sales manager at TRUMPF UK. "There are several aspects of TRUMPF press brakes that aid this strategy. For instance, operators are not only guided through the whole bending program using graphical instructions, but optical setting aids light up where the tooling should be placed. In addition, there are set access levels for different operators and setters, so programs can be pulled down, but not modified without authority. Historically, a press brake operator is one of the most skilled on the shop floor, but with TRUMPF technology the way that this skill set is utilised is changing."

KMF has ordered seven 2.5 metre bed TruBend models (85 tonnes capacity) and two 3 metre bed models (130 tonnes capacity). All nine machines feature an extended open height for bending components such as deep boxes, and all offer tooling compatibility. One machine even comes with TRUMPF's bending aid, which reduces a two-man operation to a one-man function when handling large panels.

"Other impressive features of the TRUMPF press brakes include hydraulic tool clamping [top and bottom], rapid bending speed and eco-friendly on-demand drives, which offer reduced power consumption," says Paul Johnson.

To minimise any disruption to production operations at KMF, the nine press brakes will be installed in three waves: three machines each in January, February and March 2015. Initial training will take place at TRUMPF UK's Luton headquarters before being supplemented with further training at KMF.

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Sturdy lift tables from Pallet Truck Shop

A well-oiled, fully functional fleet of lift tables is essential to the operations of many businesses, from distribution centres to manufacturing plants. Versatile, low-maintenance and portable, the table trucks can help boost productivity in the workplace and make life a lot easier for employees, who may spend much of their day lifting heavy loads. Pallet Truck Shop is one of the UK's leading providers of these heavy-duty table trucks, and the advice from the experts is to invest in a sturdy, reliable lift table to see improvement across the board.

Phil Chesworth, managing director of Pallet Truck Shop, says: "At Pallet Truck Shop, lift tables are some of our most popular products. They're very functional and great for use in a multitude of applications. Better still, they won't break the bank, nor will they cost hundreds of pounds in maintenance and repairs. We'd like to encourage more businesses to invest in their fleet of lift tables and reap the rewards. Our collection of trucks is incredibly diverse, with options including electric trucks, double scissor lift trucks and the staple 150 kg table trucks that form the basis of operations in many working environments."

The PT-TAB-00 Table Truck is the most cost-effective truck that Pallet Truck Shop has to offer. With a maximum capacity of 150 kg and a maximum height of 720 mm, it's an entry-level lift table that's ideal for a multitude of different purposes.

Pallet Truck Shop Tel: 01384 841440 www.pallettruckshop.co.uk

Atlas Copco launches all-in-one Thermo Kit

Atlas Copco is aiming to rapidly increase the adoption of compressor energy recovery with the launch of an all-in-one kit that simplifies integration with a building's central heating and hot water system. The revolutionary Thermo Kit is a complete package of energy recovery components that can be installed quickly and easily to provide the user with a highly efficient source of supplementary hot water at no additional cost.

Thermo Kit has been developed to overcome the installation challenges that have hampered widespread uptake of compressed air energy recovery. It enables users to convert excess heat from a compressor that is fitted with an energy recovery (ER) unit into hot water, which is stored in a buffer vessel connected to a typical domestic or office central heating system.

As much as 94 percent of the electrical energy used by an industrial air compressor is converted into heat and lost through radiation in the compression process. Therefore, a properly designed heat recovery unit can recover from 50 percent to 94 percent of this available thermal energy as low-grade heat, which can be used to heat water.

Thermo Kit is intended to be as simple to install as a system of solar panels. Only a limited amount of engineering work is required and installation is usually swift and seamless.

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Polytec PU 1000 from Intertronics

Polytec PU 1000 is a single part adhesive which cures quickly at room temperature to a flexible, electrically conductive polymer. It can replace traditional epoxies which are rigid and require thermal processing, giving production efficiencies and enabling new applications where pliability and conductivity is important.

Polytec PU 1000 is an electrically conductive polyurethane which addresses applications in die attach, bonding of components in hybrid circuit applications and surface mount technology (SMT); areas where silver filled electrically conductive adhesives have been used for many decades. Usually such adhesives are epoxy-based, two-component or premixed and frozen single-component systems, but now the Polytec PU 1000 polyurethane option provides a flexible bond, cost savings and performance advantages

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Cyclops Logger App launched

AMETEK LAND, one of the world leaders in non-contact temperature measurement for industries such as steel, glass and cement, has launched an innovative new App for Cyclops, its market-leading portable thermometer.

The Cyclops Logger App, which is now available to download FREE on Google play, enhances Cyclops operation by making it even easier for anyone with a smartphone or tablet to capture and share live data from a Land Cyclops portable thermometer.

The app features a unique Route Mode management system that ensures temperature measurements are recorded at pre-configured locations. Single or multiple routes can be uploaded onto the app, with the option to preset against a variety of parameters such as emissivity and window correction.

AMETEK LAND Email: land.enquiry@ametek.co.uk www.landinst.com

Working while kneeling without discomfort

Are you one of those people who occasionally works while kneeling? If so, additional protection for the knees is absolutely necessary.

You get protection from MASCOT® Workwear in more ways than one. With numerous features on the work trousers and with certified kneepads you get a total package providing a comfortable and above all a safe work environment while kneeling. MASCOT Waterloo kneepads by Evazote®-foam is ergonomically designed and can be used in all MASCOT trousers with knee pockets. They fill up well in width and have an elongated shape which can be adjusted (prepared for the kneepad and can be easily cut off), if the kneepads are to be used in small kneepad pockets.

Mascot International A/S www.mascot.dk

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Our **broaching** programme provides an efficient step to reduced cost and throughput times. It enables you to master the complete machining of inner bores on CNC lathes, milling machines and machining centres without re-clamping. The process is free of vibrations with low cutting and passive forces, leading to excellent tolerances and surface qualities. High levels of process reliability apply even when long entry lengths are required. It provides an economical way to machine high quality slots with the leaders in grooving technology. **www.phorn.co.uk**

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