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NEXT ISSUE JUNE 2019

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- SAWING & CUTTING OFF
- WORKHOLDING

Published by Roger Barber Publishing
Enterprise House, Foundry Lane, Horsham, West Sussex, RH13 5PX
Tel: 01403 266022

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Design & Production: Roger Barber Publishing
Print: Holbrooks Printers Ltd, Portsmouth, Hampshire

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Mills CNC creates new automation division

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, has created a new division to provide a focal point for, and drive sales of, its industrial and collaborative automation business. The new division, called Mills CNC Automation, was created in late 2018 and is located at Mills CNC's Technology Campus facility in Leamington.



At the beginning of this year, Mills CNC Automation, became the agent for Doosan Robotics (part of the Doosan Group). The agreement will see Mills CNC Automation supply the full range of Doosan Robotics' advanced, high-performance collaborative robot (cobot) systems and solutions to UK and Irish manufacturers.

Mills CNC Automation's industrial robot solutions have been installed up and down the country for a large number of component manufacturers operating in the automotive, aerospace, materials handling and medical sectors. These solutions, predominantly turnkey in nature, help customers increase their productivity levels, improve operational efficiencies and make them more competitive.

A new range of industrial robot solutions (called Mills CNC AutoTurn and Mills CNC AutoMill) that facilitate automated workpiece loading and unloading have recently been introduced and have already generated significant sales and widespread interest.

The agreement with Doosan Robotics will see Mills CNC Automation supply a range of technically-excellent cobots into the UK and Irish markets.

The M0609 is a compact cobot that has a 6 kg payload capacity, a 0.9 m reach radius and is designed to perform quick, routine and repetitive tasks.

The M1509 has the market's largest payload available at 15 kg as well as a 0.9 m reach radius and is designed to handle heavier objects that could pose a potential health and safety risk to humans.

The M1013 is a versatile cobot with a 10 kg payload capacity, a 1.3 m reach radius and is suitable for a wide range of tasks.

The M0617 has the largest reach radius on the market at 1.7 m, plus a 6 kg payload capacity and is designed to perform tasks that require a longer reach.

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TRUMPF shows 3D printing and AI in action at INTECH

Solutions boost production output

In an interview during the press conference at the recent INTECH show in Ditzingen, TRUMPF chief technology officer Peter Leibinger stated: "We must promote research in Europe because we otherwise risk falling behind China and the USA." Chief digital officer Mathias Kammüller added: "AI boosts competitiveness."

TRUMPF took the opportunity of its INTECH in-house trade show to present artificial intelligence (AI) solutions for the mechanical engineering industry for the very first time. As a leading provider of Industry 4.0 solutions, the high-tech company is developing AI applications for its own production facilities as well as products for customers. "Artificial intelligence is helping us derive new benefits for manufacturing from the data generated by our machines. AI is boosting competitiveness by increasing the output of connected manufacturing systems," said Mathias Kammüller, at the INTECH press conference. The company is deploying AI in a number of areas, including quality assurance processes in the production of flatbed laser machines.

Laser diodes and 3D printing open up new business opportunities

TRUMPF is expanding its range of products to tap into new market segments in the digital arena. The laser diode business acquired from Philips, for example, has boosted its access to fast-growing markets. Laser diodes are used in smartphones, digital data transfer applications and

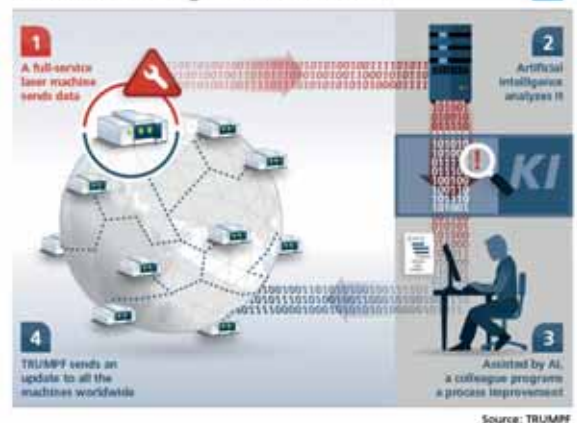
sensors for autonomous driving.

In addition to its solutions for connected industry, TRUMPF also presented 3D printing systems at its INTECH show. These are becoming increasingly popular in the dental and medical device sectors as well as in the tool and die making, aerospace and mechanical engineering industries. "Additive manufacturing techniques pave the way for more innovative production processes. They are almost unparalleled in their ability to manufacture complex shapes and small batches," said Peter Leibinger, Chief Technology Officer at TRUMPF. The company recently demonstrated how a 'green laser' could be used in the future to print materials such as pure copper and other precious metals.

Rising cost pressure and international competition

"Our customers are facing rising cost pressures, increasing demand for smaller batch sizes and an upsurge in rush jobs. The use of digital and innovative manufacturing technologies and methods is fast emerging as a key criterion for determining whether companies can retain their competitive edge in the future in high-wage Europe," explained Peter Leibinger. He emphasised the importance of continuing to pay close attention to increasing international competition, noting that the US was likely to be more open to new technologies and that China would be pushing ahead vigorously with AI technology. "If Europe is to maintain its role as an industrial leader, it is more important than ever for governments to work together across borders. We need to intensify our collaboration in the Single Market and build on our strengths by creating the

Artificial intelligence at TRUMPF



necessary infrastructure for digital business models and promoting research and innovation, otherwise we will fall behind China and the US," he warned.

Leading user of connected manufacturing

TRUMPF is driving forward digital transformation on an international level at its own plants and among its employees. "We can harness digitalisation to reduce lead times in our factories, boost productivity and reduce inventory levels. The benefits for our customers include faster job processing and simpler ordering processes," said Mathias Kammüller. All TRUMPF managers are currently participating in a training program to prepare them even more thoroughly for digital transformation.

"The time has come to seize the opportunities offered by digitalisation and new manufacturing technologies. It's not just big German companies, but also small and medium-sized ones that need to be asking themselves whether they are ready for the digitally connected future. If the answer is no, they need to embark on that process of transformation today," continued Mathias Kammüller, noting that digitalisation can be started at any point in time and is equally accessible to SMEs.

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Which industries use 3D printing?



Quelle: TRUMPF

Power and productivity for the future

Open House 2019, 4th – 6th June, TRUMPF Technology Centre, Luton

At whatever stage manufacturers may be in the process of sheet metalworking automation, the TRUMPF Open House will help them develop new ideas and the best solutions. Visitors will be able to speak with technology experts and see the latest generation machines, lasers and software in action to gain inspiration for their own production facility.

The event is designed to empower the manufacturing community to make production more efficient, flexible and adapted to a highly competitive market. This is the ideal forum for manufacturers to see how they can benefit from Industry 4.0 and explore the potential of networked production using innovative TruConnect solutions that allow step-by-step integration, tailored to their needs.

TRUMPF brings this concept to life with an autonomous laser cutting demonstration with Active Speed Control on the new TruLaser 5030 fiber 10 kW laser cutting machine. This new technology monitors the

kerf through the nozzle, oversees the cutting process and independently regulates feed rate. The focus is on maximising both speed and safety, allowing productivity to be taken to the next level.

Manufacturers will learn how TRUMPF Smart Services, such as Easy Order, Service App and Remote Service, can simplify their daily work. They will also be able explore the advantages of the MyTRUMPF customer portal.

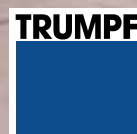
Other highlights will be a new model of the TruLaser 3030 fiber laser cutting machine with automation and the new generation of TruBend 7000 series machine, the ergonomic high-speed bending solution. TRUMPF Power Tools will present the new TruTool TKA 1500 beveller and FCN 250 composite nibbler.

Register via the following link:
www.trumpf.com/s/open-house or via email to marketing@uk.trumpf.com



Register now!

4th – 6th June at the TRUMPF Technology Centre in Luton



TRUMPF Open House 2019

Power and productivity for the future

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Competence in flexible manufacturing and excellence in smart manufacturing

John Barber reports from Italy

MCM S.p.A. is an Italian company based in Vigolzone, Piacenza in the middle of a historical machine tool district. The company was established in 1978 and today it represents a solid international firm in the machine tools sector with three production sites, all located in the Piacenza district. It has subsidiaries in Germany, France, United States and China with service partnerships in Spain, Russia, UK and Poland.

The core business of MCM is based on its flexible manufacturing systems featuring high performance and high technology contents. The base of these systems is represented by its 4- and 5-axis horizontal machining centres, available in a wide and structured range, even in multitasking configuration, milling, turning and grinding. MCM also stands out for its vocation as a system integrator, manufacturing systems based on its own machining centres, but also machine tools of different types, automation systems and unconventional process technologies. MCM systems are designed to guarantee the maximum performances in terms of precision, productivity and reliability.

MCM has installed 2,500 machining centres in 30 countries around the world. As of 2019, it has over 300 employees, which represents impressive growth considering, when it was first established, the company had just a handful of people. 18 percent of its staff are based in the engineering department. Its approach is to have a close partnership with each customer and an ongoing dialogue with them.

The company's size allows it to be



extremely flexible in terms of process fluidity and this is complemented by its highly skilled staff. It enables MCM to design, build and optimise all of the main components installed on the machines. It holds the complete control of its product facilitating the flexibility, the customisation and the possibility of reconfiguration and maintenance of its production systems.

Gian Luca Giovanelli, CEO of MCM, says: "We have been able to combine traditional elements with new elements. This has been key to our ongoing success. There has been a policy of accelerated investment in Italy over the past few years and, from the point of view of a subcontractor, there are many potential solutions with us. Half of our turnover comes from subcontractors."

The flexibility, high-quality, reliability and technical excellence of MCM systems are also demonstrated by the variety of its customers. MCM is a reliable partner for companies of all sizes belonging to all precision mechanics sectors, particularly in aerospace, automotive and energy.

MCM is also one of the most active and virtuous European companies when it comes to applied industrial research as it boasts several patents and collaborations

with universities and research institutes.

Since its foundation, the company has recognised the importance of information technologies as a fundamental element of its offer. For this purpose, MCE, the IT division of MCM, was established in 1986.

MCE develops a series of software services for the production supervision, organised in the 'jFMX' suites. The jFMX architecture is structured on different levels in order to manage growing plant and information complexities, up to a possible coordination and centralised management of an entire workshop.

All of the MCM machining centres are available with 4- and 5-axis and multitasking configuration. In terms of automation, all machines can be stand-alone, bi-pallet, multi-pallet, carousel or FMS. The machines offer customisation options and a wide choice of accessories are available.

It is possible to group the basic MCM machine range in tabular form based on the dimension of the transversal axis as follow:

Since its establishment, MCM has aspired to manufacture horizontal machining centres and flexible manufacturing systems that are state-of-the art, often anticipating the times compared to technological trends that would become topical only later. The company's impressive range of machining centres comprises Clock line, Tank line and Jet Five line.



The Clock 800 is a high quality small-medium size-machining centre and represents the access machine to the MCM range. Part of the Clock family, that also includes the Clock 1200, it is largely adopted by subcontractors, that require high flexibility and autonomy of production, especially when machines are configured in multipallet or FMS solution. Clock machining centres can be 4-or 5-axis and can multitask for milling, turning and grinding operations, like all MCM machines.

This Clock 800 is a 5-axis machine, with tilting table and multipallet-10 system consisting in a carousel with seven pallet stocking units + 1 loading/unloading station + 2 positions pallet exchanger.

The Jet Five machining centres have very customised solutions and guarantee excellent removal performances, thanks to the high stability of the structures and to the bi-rotary tilting head with a HSK 125 spindle that can reach 1,750 Nm of torque. The working volume is X=5100, Y=1500, Z=800 mm. Jet Five machining centres are the maximum expression of MCM's technological skills and are designed and built under customers specific manufacturing requests.

Tank 1300 represents a 'best seller' in MCM product range. The hundreds of units sold during the MCM history prove the reliability of this model. Moreover Tank 1300 has been, in the past, the base for the application of new technologies such as tilting heads and multitasking machining.

RK International Machine Tools Ltd was founded in 1951 and is a privately-owned company that spans three generations. Since this time, it has been involved in the

supply of quality machine tools to a variety of customers. Clients requiring individual machine tools or major industrial turn key packages are serviced in exactly the same professional manner. The company's expertise was recognised by MCM, who were looking to gain a foothold in the UK market. Subsequently, a partnership was officially unveiled at the Farnborough International Airshow in July 2018.

Simon Rood, director and general manager at RK International, says: "We were approached by MCM at MACH 2018 and were immediately impressed by the levels of technology and automation that they can bring to the aerospace sector in particular.

"MCM already has an enviable reputation across mainland Europe and beyond, with installations in many of the leading aerospace OEMs and Tier 1 suppliers. Their ability to provide a full turnkey solution for a customer's requirements, customising the system to their specific needs, is also a major benefit in ensuring the right solution is delivered every time."

Stefano Tirelli, sales manager at MCM, adds: "The expertise and experience of RK complements our skills and knowledge perfectly."

Secondo Mona is an important historical Italian company belonging to the same family since its foundation in 1903. Located in Somma Lombardo, very close to Malpensa airport, it is considered a pioneer firm of the Italian aircrafts industry and MCM S.p.A. is very proud to count Secondo Mona among its customers.



At the beginning of the twentieth century, the company began its activity with the sale and repair of cycles and motorcycles when, in 1910, its founder Secondo Mona fascinated by the first biplane flights around Malpensa, decided to offer his mechanical competence to this world.

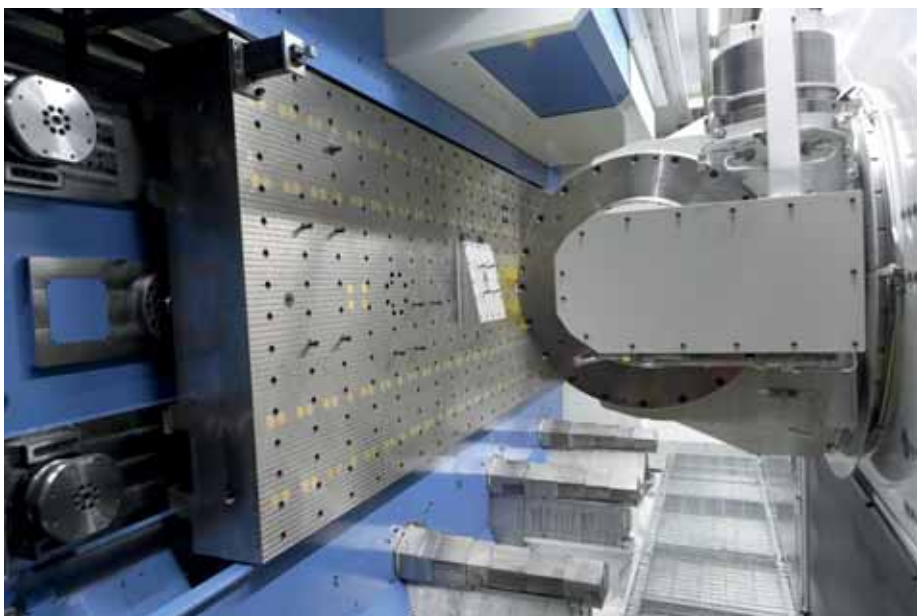
The company has experienced significant developments over the course of its history, from both a technological and market point of view. Today, Secondo Mona designs and manufactures aircraft components under specific requests of the manufacturers. Its core business is based on the design and development of fuel systems, sub-systems and equipment, which are supplied to worldwide civil and military aircraft and rotorcraft manufacturers, as well as UAVs, on the industrialisation and production of landing gear equipment and complex sub-assemblies for major aircraft landing gear manufacturers. Other special actuators and aircraft engine components are also supplied.

During its history, Secondo Mona has constantly invested in new machines and technologies in order to reach high productive flexibility and quality. It prides itself on over 100 years of aerospace technology history and MCM has been part of its technological growth since the early 2000s. It has, in fact, been using MCM machines since 2003 with seven machines currently in its portfolio.

Secondo Mona initially invested in an MCM machine as it wanted a machine with many pallets. They chose MCM as the company has a good solution and provides them with excellent maintenance and service.

For further information on this exciting range of machines and technology, contact:

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Double column machining for the automotive sector

Okuma offers high precision for large dies

Okuma, represented in the UK by NCMT, meets the special demands of the automotive industry. Its double column machining centres provide high precision during the manufacturing of large parts. With over 50 years of experience and a production capacity of 40 units per month, Okuma is a leader in manufacturing double column machining centres. Currently, there are over 8,000 Okuma double column machines in use, of which roughly 3,500 are used in the automotive sector. Machines like the MCR-B111 or the recently introduced MCR-S are used by nearly every automotive manufacturer worldwide. Most cars on today's streets are therefore at least indirectly and partially manufactured by an Okuma machine.



Special requirements in the automotive sector

Within the automotive sector, Okuma's double column machining centres are mainly used for manufacturing dies for the production of car body shells. This process poses various challenges, as the large workpieces require high dimensional accuracy. Dies also need to possess very smooth and clean surfaces. Achieving the required results is difficult because the manufacturing process can take several days. The long machining time makes the workpiece vulnerable to deviations, due to temperature changes and other external influences during the manufacturing process.



Intelligent technology for high quality

These problems are solved by multiple highly-tailored applications and features. Okuma's Thermo-Friendly Concept helps to both minimise the amount of heat generated and compensate thermal deformations that cannot be avoided. The Premium Solution Hyper-Surface allows for excellent surface quality by correcting machining data automatically, which improves overall quality and eliminates the need for hand-finishing. The solid cast iron double column construction of the machines ensures great rigidity and close tolerances. A touch probe enables on-machine gauging of complex shapes in mid-process.

Pablo Liechti, product manager at Okuma, says: "Manufacturers in the automotive sector appreciate our double column machines' high dimensional accuracy of less than 20 µm, even for workpieces measuring up to 2,000 mm in width and 5,000 mm in length."

High productivity

Okuma's double columns are equipped with a multitude of applications, making them as productive as possible. The Intelligent Technology SERVONAVI optimises cutting and feed rates. "This enables us to shorten production times by up to 25 percent," states Pablo Liechti. The Thermo-Friendly Concept also increases productivity by minimising warm-up times. In order to meet the manufactures' specific demands, Okuma's double column machining centres can be configured in many ways. Customers can choose different spindles, a wide range of attachment heads and table sizes up to 4,500 mm in width and 12,000 mm in length. Many additional features and setups are available.

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As a world-leading manufacturer of high-end cutting tool solutions for the automotive industry, MAPAL has once again improved productivity and performance, as well as reducing costs, for one of the UK's leading Tier 1 automotive manufacturers. Helping a UK manufacturer chase the automotive holy grail of reducing cost-per-part, MAPAL has demonstrated its competence with this particular Yorkshire manufacturer.

With manufacturing facilities on three continents, the Huddersfield automotive expert has an unparalleled reputation for manufacturing turbocharger, transmission and engine components for the global automotive market. It was the winning of a new long-term contract to manufacture cast aluminium CAM carrier components that led the company to instigate tooling solutions from MAPAL.

The initial contact with MAPAL, over five years ago, was due to a requirement to retain tight tolerance parameters and SPC values during production machining and secondly, to reduce tool inventory on its machine tools. Referring to the situation, MAPAL's application engineer Frank Gallagher says: "This customer is producing over 7,000 cast aluminium CAM carrier parts each week. To do this, it opted for a series of high-speed FANUC RoboDRILL machining centres with a BT30 spindle, Nikken rotary trunnion and 21 tool ATC. Unfortunately, the extremely complex parts required upwards of 100 different tools per part and our initial remit was to reduce inventory to meet the tool capacity of the machines."

Of course, a result of this lean investigation would reduce inventory costs and reduce cycle times; both areas of expertise at MAPAL.

Implementing the cost down strategy

Demonstrating its unrivalled expertise in the automotive sector, MAPAL has dozens of continuous improvement examples at this automotive leader. Frank Gallagher recalls: "We had one challenging hole that initially required three different drills and with limited tool pockets on the machine, our aim was to reduce tool inventory and operations. The three previous steps included a pilot hole, a 12 XD drill and then a 7 mm diameter finishing drill at 40 XD. The three drills were required to negate the challenge of entering a cast surface, drill wander and breakage. However, we identified opportunities to improve the process that was relatively time consuming with swarf removal being a key challenge. Even with a 40 XD hole, we found a single tool solution.

"This success was replicated on a 25 mm diameter bore that is machined to a 70 mm depth. Initially, this was rough and finish bored with a chamfer tool finishing the process. We eliminated this 3-tool process by introducing a single multi-stepped tool capable of rough, semi and finish machining the precision bore with a chamfer at the end of the tool."

While these applications exemplify the reduction of tool inventory, they also reduced cycle times considerably. An example was noted on a non-critical 25 mm

bore, which was machined with a MAPAL PCD boring tool. Frank Gallagher continues: "We had a 25 mm bore that was taking 90 seconds to machine because swarf clearance and surface finish were an issue. We changed the machining parameters, on numerous occasions, to improve cycle times. However, the process required a complete strategy shift and we manufactured a special version of the 3-flute Tritan Drill to reduce cycle times from 90 seconds to 10."



Top down approach to quality

The 400 mm by 250 mm CAM carrier components require a range of MAPAL drills, multi-function step drills, PCD grooving, boring and face milling tools, as well as a selection of roll taps. To meet many of the tight tolerances in the region of +/-5 microns, the customer was guaranteed a +/-3 micron tolerance on the tools to ensure all components are 100 percent compliant with dimensional demands. To ensure this compliance, MAPAL manages tool inventory with its UNIBASE Tool Management System and a weekly visit from one of its engineers.

MAPAL has installed a UNIBASE tool management system, with a second slave unit that houses tools in a vertical position to protect the tools and increase tool capacity while reducing floor area. The vertical toolholding drawers have BT30 toolholding pots in the drawers to minimise tool movement and subsequent damage.



Frank Gallagher adds: "All tools are preset by MAPAL at our Rugby headquarters and supplied in the various BT30 and shrink-fit toolholding units. This means the tools in the UNIBASE are preset to the required tool lengths and ready to install directly into the machine, eliminating the tool presetting process for the customer. It also eliminates the opportunity for error."

The weekly MAPAL visit will see the engineer check all tools and take worn or damaged tools back for regrinding and resetting. It will then be returned to the UNIBASE vending system at the automotive facility. The regrind service certainly reduces tool inventory and costs, giving the end user complete visibility of tooling consumption and costs. However, the service is not just about cost reductions, inventory management and simplification.

Frank Gallagher explains: "Our PCD face mill tools have a series of cartridges that each require precision setting. Our in-house team will set the tools to a height, diameter and concentricity of less than +/-3 microns. This very high level of precision is a necessity when the customer has a number of +/-5micron tolerances that are tied together on the CAM carrier parts. This can be a challenge for any customer, but having it managed by the MAPAL experts will eliminate any opportunity for error."

In conclusion, Frank Gallagher says: "From the outset, we have exceeded the needs of this customer. We started by reducing tool inventory and non-cutting times. From this, we have worked to continually reduce cycle times and 'cost-per-part' parameters. When we installed the UNIBASE system at the end of 2017, we supplied a management system that enables the customer to calculate the contribution of cutting tool costs to the overall cost-per-part. I am delighted to say that MAPAL is well below the



cost-per-part parameters as well as the continuous cost-down expectations of the customer, something that is essential in the global automotive industry."

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Cowie Engineering enjoys faster cutting with Sodick wire EDM

Cumbernauld-based subcontract manufacturing specialist Cowie Engineering has continued its investment drive by installing a Sodick VL600Q CNC wire erosion machine from Sodi-Tech EDM. The move has seen the replacement of an existing Sodick machine that had reached the end of its useful working life. Since installation, Cowie Engineering says that the VL600Q has not only simplified programming and setup but boosted cutting speed by approximately 20 percent.

Cowie Engineering was established in 1999 by Rodger Cowie with little more than a manual milling machine and lathe. Since then, business has positively thrived, with the company doubling the size of its factory in 2006 and again in 2011. Cowie Engineering, which is ISO9001 accredited, puts much of this success down to its long-standing ethos of being a quality engineering company that delivers first-class precision manufacturing services.

In light of this, the company invests heavily in the latest CNC manufacturing technologies. In the past year alone Cowie Engineering has installed new turning, milling and CMM (co-ordinate measuring machine) technology, a trend that was recently extended to the company's EDM section.

"Although our previous Sodick EDM had given a lot of good service, we knew the time had come to seek a replacement," explains director Ross Cowie. "However, due to the reliable nature of the machine and our familiarity with the technology, we opted to look no further than Sodick for the new investment."

Upon discussions with Sodi-Tech EDM, the Sodick VL600Q was recommended, based largely on its size capacity and price point.

"We wanted to effectively double the size capacity of our previous EDM, so the VL600Q made perfect sense with its axis travels of 600 x 400 x 270 mm," explains Ross Cowie.

The VL600Q wire EDM features Sodick's Linear Motor Technology. As an advanced line of performance wire EDMs, the VL series builds on the technologies of the SL series. The large VL600Q is well suited to a wide



range of machining applications, making it perfect for a subcontract specialist such as Cowie Engineering which can never be certain what will come through the door tomorrow.

Currently, work at Cowie Engineering is focused on a number of key sectors. For instance, the company reports that the oil and gas sector has shown particular signs of strength. Here, Cowie makes parts for wireline pressure control equipment, deployment systems, downhole tools and exploration well testing gauges, often from materials such as Inconel, CA104 aluminium bronze, and 4140 and 4145 alloy steel.

The bottling industry is another key segment for Cowie Engineering, which has for many years supplied components for container handling equipment, largely from materials like stainless steel, aluminium and engineering plastics/composites.

Further industries served by the company include robotics, defence and electrical. In addition, Cowie Engineering reports that it has just secured a contract for a new sector, motorsport, and parts required for this customer are among those currently being produced by the new Sodick VL600Q.

"The machine is kept busy producing a number of different components and features," states Ross Cowie. "Typical operations include the creation of keyways, squares and splines for customers in the bottling, motorsport and oil and gas sectors. As well as providing around 20 percent faster cutting speed, we've found that the



Sodick VL600Q offers far easier programming and setup than our previous machine. The on-board Heart NC software is really effective, which is probably why we only needed two days of training at Sodi-Tech EDM to pick things up."

As a result of the increased cutting speed and ease of programming, the company has comfortably consumed its existing wire EDM requirements and currently has capacity to fill on the new VL600Q. However, Ross Cowie expects this situation to change shortly as relatively few subcontract precision engineering firms in Scotland offer wire EDM.

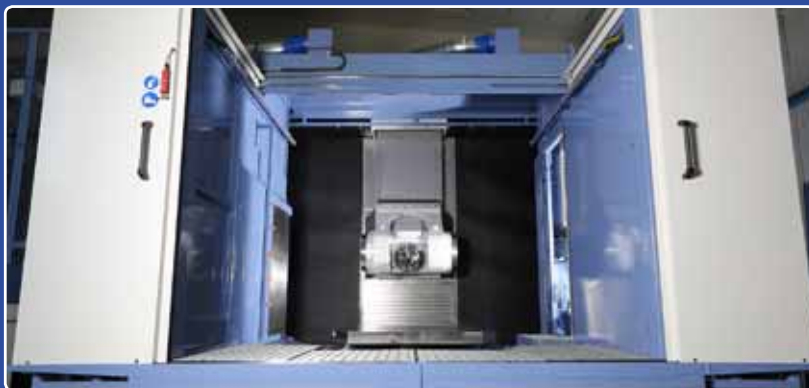
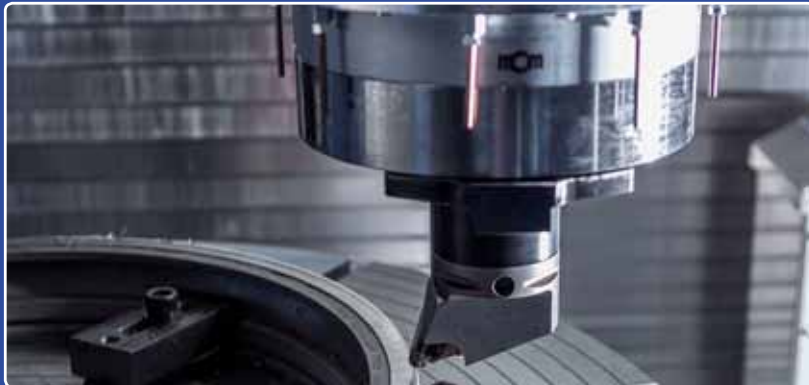
"Along with our overall package and responsiveness, machines such as the Sodick VL600Q definitely differentiate our business from others. In fact, we have already undertaken subcontract wire EDM work for a few competitor companies. Machines like this support our ethos of supplying quality components."

Cowie Engineering, which currently has 25 employees and growing, specialises in manufacturing critical precision components to exacting quality standards. Quality is important at all times throughout the manufacturing process, from enquiry right through to delivery.

"Investing in the latest CNC machine tools underpins our quality commitment to customers," Ross Cowie concludes. "The Sodick machine has not missed a beat since it was installed, while the support from Sodi-Tech EDM has been equally good."

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Nakamura technology is key to success

CNC investment helps Merc Aerospace capitalise on £500,000 sales boost

Moving to 'one-hit' machining has delivered a Lancashire precision engineering specialist a £500,000 boost after securing a string of new orders.

Merc Aerospace, which employs 50 people at its facility in Barrowford, has seen turnover rise to £4.2 m thanks to a sustained investment drive that has included the purchase of two state-of-the-art CNC machines from the Engineering Technology Group (ETG).

The company has replaced five older models with two Nakamura WT150IIs as part of its commitment to lean manufacturing and reducing lead times for customers including Airbus, AgustaWestland, BAE Systems and Bombardier.

Equipped with industry-leading Fanuc and Smart X control software, the multi-axis CNC machines will drastically cut down on setup and programming times, as well as freeing up over 150m² of floorspace for future acquisitions.

"We are focused on offering our clients the lowest total cost of acquisition solution for their precision components," explains Richard Meade, commercial director at Merc Aerospace. "This is where the two Nakamuras really come into their own and ensure we live up to our promise, delivering fantastic control, speed and repeatable quality. Our customers have been so impressed with these new capabilities that they've placed new product orders with us, building on a £500,000 increase in annual sales for 2018.

"ETG is a solution provider and engaged with us to explore which machines would help us explore new opportunities. It was a seamless transition from order placement to delivery and operator training, with the initial results being extremely impressive.

"The turret mounted power tooling, in particular, ensures components with



Merc Aerospace's Les (l) with John Brimblecombe, ETG

complex milled features are coming off virtually burr free and generally as a one-hit operation."

John Brimblecombe, regional sales manager at Engineering Technology Group, adds: "Nakamura technology has really grown in popularity in the UK, with many subcontract manufacturers switching on to the outstanding performance and value for money it offers.

"The WT150II gives provides up to 26 kW of cutting power available for turning shaft-work with synchronised spindles, while the driven-tool motor power is suited for heavy cutting with very small tools."

"This is perfectly suited for the complex precision components that the customer specialises in. In addition, Merc has also benefited from replacing five machines with two Nakamura WT150IIs, with the twin spindle and twin turret configuration and driven tooling and Y axis helping to remove milling operations and reduce both setup and cycle time considerably."

Merc Aerospace has over forty years' proven expertise in serving the aerospace, defence, energy and oil and gas sectors. It offers 5-Axis milling, CNC turning, EDM and aerospace assembly services from its 20,000 sq ft factory, as well as capitalising on increasing demand for 'fast make' short lead time parts.

Richard Meade concludes: "Our 'one-hit' machining approach has really improved our productivity and, in turn, made us more competitive when looking to secure new opportunities both at home and overseas.

"We're not going to stand still though. The emphasis is on continuous improvement and we have already signed-off further investment, with delivery of a twin spindle, triple turret Nakamura NTY3-150 multi-axis lathe scheduled for April 2019."

Engineering Technology Group (ETG) delivers highly productive turnkey solutions to customers involved in automotive, aerospace, domestic goods, high value engineering, medical and oil and gas. Its portfolio of world class brand includes Bavius, Hardinge Bridgeport, Chiron, Nakamura, Quaser and STAMA.

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TRUST THE BEST - TRUST STAR GB

Dugard enters the sliding head market

In recent years, the sliding head turning market has seen the niche machining technology continually impact sales of fixed head turning centres. This is largely down to the evolution of sliding head turning centres and the ability of manufacturers to increase the power and capacity of sliding heads while retaining the small footprint, kinematics and productivity levels that far exceed fixed head variants. To exploit this opportunity, Dugard Ltd has now become the sole UK & Ireland sales and distribution outlet for the Korean brand of Hanwha sliding head machine tools.

Since becoming the UK outlet for Hanwha at the end of 2018, Dugard has enjoyed considerable success with the brand and has now appointed Colin Thomson as its sliding head specialist to drive the benefits of the technology to the Dugard customer base. He says: "Dugard is in a unique position to offer customers industry leading sliding head and fixed head turning solutions. This enables us to provide the most suitable tailored solution for end users based upon the dimensions, quantity and complexity of their components. While complementing the larger fixed head range of Dugard turning centres, the Hanwha brand has capacity and power capabilities that far exceed that of existing sliding head alternatives, allowing Dugard to truly bridge the gap between fixed and sliding head technology."

The Hanwha range is available in four range variants with the XD Series, XD Special/STL Series, the XE and XP Series of machines, which can all cater for the extremely diverse demands of turned part manufacturers. The XD Series starts with the smallest XD03 and XD07 machines that offer



a maximum bar capacity of 7 mm, delivering a main and sub spindle power output and speed of 1.5 kW and 16,000 rpm respectively. Packed into a 1.5 m by 910 mm footprint, the smallest XD03 and XD07 offer flexible tooling configurations and impressive kinematics for optimal productivity rates on small parts. The XD Series also offers an XD12III/16III, XD20II, XD20V, XD26II, XD32II, XD35II, XD38II and the largest XD42 with a maximum capacity of 45 mm diameter. With a familiar FANUC control interface, uncompromising kinematics and endless tooling configurations, the XD range is a cost-effective solution for all your small part requirements.

For manufacturers looking to achieve the production of complex parts, the STL32, 35H and 38H Series incorporate M8 rigid tapping, Y3-axis with up to 40 tool positions, a powerful Siemens 840D control unit that controls the seamlessly endless capability of its 9-axes. Built upon a robust structure, the STL32H, 35H and 38H offer industry leading main and sub-spindle power of 23 kW that drives components at up to 7,000 rpm.

Perfect for heavy duty machining and the cutting of difficult to process materials, the XE12, 16, 20, 26 and 35 machines have been introduced. With an optimised mould casting and rib structure developed through FEA, the XE Series work envelope has been designed for maximum material removal rates. The range has a maximum spindle speed of 6,500 rpm, 8,000 rpm or 10,000 rpm with a maximum spindle speed of up

to 5.5 kW, depending upon the variant selected.

Adding to the Hanwha line-up from Dugard is the XP Series with variants including the XP12/16, XP12S/16S, XP20, XP26 and XP26S. The economical XP Series offers best-in-class tooling performance, integrated motorised spindles for high-precision and high-speed machining capabilities.

Colin Thomson says: "The Hanwha sliding head range is so diverse, we have something for everyone. The XE and XP Series are both great all-rounders with an economical price point that makes them the best-selling machines for performance and productivity on a budget. The STL Series is the most powerful turret model with a 10-station turret for VDI and BMT configurations, while the XD Special Series takes this capability a step further. It offers the ultimate tooling flexibility with its B-axis and Y2 axis and specially configured tool layout for the production of complex parts.

"Added to the various machine models, we can configure the machines to meet the needs of the end user with a host of options that include tool breakage detection, through-coolant, guide bush and guide bush-less operation, driven tooling, chilling units, gear hobbing, modular tool configurations, chip conveyors, extended coolant tanks, motorised air spindles and a selection of cross drill configurations."

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A big addition - quite literally!

Mills CNC, the exclusive distributor of Doosan machine tools in the UK and Ireland, has announced that Doosan's highly popular range of ultra-productive DNM vertical machining centres has been expanded with the recent introduction of the new DNM 6700XL, a machine which, amongst its many attributes, features a 2.1 m X-axis.

The DNM 6700XL has a significantly longer 2.1 m X-axis compared to the 1.3 m axis on the standard DNM 6700 machine, as well as a larger work table (2,200 mm x 570 mm). The new DNM 6700XL will therefore appeal to component manufacturers who machine large and long parts, as well as those who want the flexibility to machine multiple 'smaller' parts in single setups.

The new machine provides manufacturers with all the speed, power, precision and reliability that are the hallmarks of Doosan's DNM range.

The new DNM 6700XL machines supplied by Mills are equipped with powerful, directly-coupled spindles (18.5 kW/15,000 rpm) as standard which minimise vibration and reduce noise

(especially) during high-speed machining operations. The spindles also have 20 bar TSC (Through-Spindle-Coolant) capability.

The machines' advanced spindle technology, which also facilitates smooth acceleration and deceleration, delivers improved cutting performance and, as a result, ensures high component quality with excellent surface finishes.

The machines also feature Doosan Machine Tools' much-vaunted proprietary thermal compensation system which minimises the effects of heat generation and regulates thermal expansion ensuring high component accuracies and process optimisation.

DNM 6700XL machines get down to business fast and boast impressive 36 m/min rapid rates on their X- and Y- axes and 30 m/min on their Z-axes. Unproductive non-cutting times are further reduced via the machines' 30-position rapid automatic tool changers (up to 40 or 60 position options available) which are recorded as having a tool change time (T-T-T) of 1.2 seconds.

In addition to their obvious productivity



credentials, the DNM 6700XL machines are also reliable and environmentally friendly and feature grease-lubricated axis travels as opposed to oil lubrication, which help to reduce maintenance costs by up to 60 percent and machine downtime, as well as eliminating the need for oil skimmers.

The new DNM machines' grease cartridge systems only need replacing every three months as opposed to oil-based systems which require more frequent servicing and manual intervention.

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High productivity, small footprint

FANUC UK expands its M-20iD and ARC Mate 120iD series

FANUC UK has expanded its extensive range of industrial robots by introducing two new models, the M-20iD/25 handling robot and the ARC Mate 120iD welding version. Controlled by the R-30iB Plus Controller, both new robots are characterised by higher axis speeds and a large working area relative to previous models.

The M-20iD/25 is ideally suited to handling tasks including loading/unloading machines and parts manipulation. Its slim, lightweight design, combined with a compact arm and wrist, provides maximum reach even in crowded production environments. Capable of lifting payloads of up to 25 kg at a range of 1,831 mm, the M-20iD/25 also boasts an IP67 protection rating, rendering it ideal for applications under adverse environmental conditions, such as grinding or deburring.

The ARC Mate 120iD, in possession of a maximum payload and range identical to that of the M-20iD/25, is perfectly designed for welding applications. As with the M-20iD/25, the ARC Mate 120iD has a slim, articulated design, allowing it to weld in narrow machine tools and jigs.

"With its superior dynamics and seamlessly integrated welding equipment, the ARC Mate 120iD will ensure that customer productivity increases," explains

Andy Armstrong, FANUC UK sales and marketing manager. "Customers can also be confident of reduced assembly effort and lower operating costs thanks to smooth surfaces and recessed bolts, which aid in preventing dirt build-up."

With both new robots featuring an IP67 protection rating and a smooth dirt-inhibiting finish, FANUC UK's commitment to improving ease-of-upkeep is evident. Following on from this, both the M-20iD/25 and ARC Mate 120iD come with the R-30iB Plus controller as standard, which helps to simplify the programming process through an easy-to-use interface.

Andy Armstrong adds: "The introduction of the M-20iD/25, alongside the ARC Mate 120iD, represents our determination to provide customers with a comprehensive range of robot solutions. Both robots are uniquely suited to operating in tight environments, able to reach closer to their own base than predecessor models with an active stroke range of 1,585 mm."

Offering improved repeatability of up to ± 0.02 mm and significantly higher axis speeds as a result of new drive trains, the M-20iD/25 and ARC Mate 120iD further improve the options available to FANUC UK customers.

Andy Armstrong concludes: "Expanding the range of robots available to our customers shows that automation is accessible for everyone. High-end performance in a slim-line package means these new robots will be excellent additions to FANUC UK's extensive industrial robot portfolio."

For more information on the M-20iD/25 and ARC Mate 120iD, or to see other robots in the range, visit: www.fanuc.eu/uk/en/robots/robot-filter-page

At its state-of-the-art headquarters in Ansty Park, Coventry, FANUC UK brings together world-leading capabilities in industrial robots, machine tools and plastic injection moulding machines to facilitate the complete integration of factory automation systems for UK manufacturers.

FANUC UK works in partnership with FANUC Europe Corporation to provide a



range of customer support services, including sales, product support, parts, repairs, and training, as well as development of bespoke engineering systems. FANUC UK is a subsidiary of FANUC Europe Corporation and employs approximately 107 staff.

The FANUC Corporation is a world leader in factory automation for CNC control systems, robots and production machinery (ROBODRILL, ROBOCUT and ROBOSHOT). Since 1956, FANUC has pioneered the development of numerically controlled machines in the automation industry. With 263 locations supporting 108 countries worldwide and more than 7,000 employees, FANUC offers a dense network in sales, technical support, research & development, logistics and customer service.

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ABB launches its most compact and lightweight 6-axis robot ever

New IRB 1100 enhances the industry's most comprehensive offering for fast, accurate small parts assembly solutions

ABB has launched its smallest, lightest robot yet as part of its growing offering of solutions for small parts assembly. The IRB 1100 was designed to meet the challenges of semiconductor, pharmaceutical and electronics manufacturers needing to handle small and often delicate parts while working at speed without compromising productivity or quality.

The IRB 1100 offers up to 35 percent faster cycle times to maximise productivity, and best-in-class repeatable accuracy. Powered by ABB's new OmniCore™

controller, it is equipped with advanced motion control capabilities, making it ideal for supporting rapid assembly, pick and place and materials handling applications.

With a 10 percent smaller footprint and a 20 percent lighter, slimmer body compared to previous robot generations, the IRB 1100 can be deployed in confined spaces and existing automation lines. In addition to improving production space flexibility, the IRB 1100 also allows more flexible handling for heavy-load operations with complex tools or end effectors.

"Today's manufacturers need to squeeze every drop of value out of their factories, from their automation systems and even their floor space. The IRB 1100 is designed to support both these imperatives and create opportunities to get the most out of every last centimetre of production," says Per Vegard Nersteth, managing director of Robotics at ABB. "This is ABB's most compact and lightweight robot ever, and a great addition to our small parts assembly solutions portfolio."



The IRB 1100 is among the first of a new era of robots built around ABB's new flexible design approach, which will help introduce a wider variety of robot sizes and variants that can be combined into tailored solutions. It will be certified for cleanroom applications in the future and is available in two variants: one with a 4 kg payload with 475 mm reach, and one with a 4 kg payload and 580 mm reach.

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IRB 1100 compact and lightweight 6-axis robot delivers maximum flexibility

Robotic roller hemming

Comau, a global leader in advanced industrial automation, is taking a quantum step forward in digital-enabled solutions for lightweight vehicle manufacturing with its new robotic roller hemming process.

Fast, flexible and extremely precise, Smart Hemmer is a highly compact, symmetrical roller hemmer able to hem any complex joint. It is the perfect solution for the new generation of electric, hybrid and traditional lightweight vehicles as it is designed to allow automakers to join dissimilar materials using a cold process that grants complete control throughout the process.

Smart Hemmer addresses the dual market requirements of increased efficiency and accuracy. Its innovative design features two flexible rollers in which the linear roller can automatically disengage when encountering obstacles or a curved path and avoids the costly and inflexible fixed anvil, apparent in all traditional roller hemming processes. As a result, Smart Hemmer can perform curved path hemming and manage complex angles as part of a single, continuous process.

Smart Hemmer is also able to maintain a constant hemming thickness even when encountering multiple layers of dissimilar materials.

The result is an Industry 4.0-compliant hemming head, jointly developed by Comau and a world-class automotive manufacturer, offering high reliability, inherent flexibility and complete process control while ensuring the geometric uniformity of the assembled parts.

"Comau's newest hemming solution features a revolutionary design that renders it extremely fast and efficient for lightweight and e-vehicle manufacturing, while eliminating the costly attributes of the product as well as the associated production process," explains Giovanni Di Stefano, head of process technologies, "The Industry 4.0 compliant solution lets automakers to innovatively join components together with full in-process monitoring of the joint."

Field-tested and validated by major European automakers, Smart Hemmer is a standardised product that can be applied to all vehicle architectures and complements



the complete array of similar technologies developed by Comau in the cold joining environment. It is available immediately at a global level.

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On safe paths

The RSL 400 safety laser scanner not only ensures that automated guided vehicles (AGVs) are operated safely by means of protective and warning fields but also simultaneously captures the measurement values for the navigation software. When the triangulation principle is used for navigation, AGVs are usually equipped with two different sensors: one for safety and one for navigation.

The new RSL 400 safety laser scanner from Leuze electronic offers a true alternative; not only is it capable of handling the safety aspects but it also provides all measurement values for the AGV's navigation based on the natural-navigation principle. In addition, the measurement values have an extremely high angular resolution and accuracy. This is important to precisely determine the position of the AGV. This means that only one scanner is needed for safety and navigation.

Measurement value output of the RSL 400 is optimised for navigation software that functions according to the principle of natural navigation with SLAM (Simultaneous Localization and Mapping). With each revolution of its deflection unit, which last 40 milliseconds each, the safety laser scanner emits 2,700 light pulses. These are scattered in all directions on obstacles. Parts of the scattered light are transmitted back to the scanner and used to calculate the distance to the obstacle. Similar to a map, the navigation software contains an image of the respective room, including all fixed boundaries. The current position of the AGV



The RSL 400 merges safety technology and high-quality measurement value output in a single device

is then calculated by comparing the measurement values to the map. This concept is referred to as natural navigation. The more detailed and exact the measurement values of a scanner are, the more precisely the AGV can navigate. With an angular resolution of 0.1° , the RSL 400 can capture the environment in high detail over the entire measurement range up to 50 m. This is achieved through a particularly narrow laser spot that maintains its perpendicular shape over the entire scanning angle. It also reduces incorrect measurements, the likes of which can occur on edges.

An eye on obstacles

How far away is the obstacle? In addition to the angular resolution, the distance values are also important. With a typical error accuracy of < 30 mm, these are highly precise. In addition to that, the values are not affected by the reflectance of the object, whether it is a reflector or a black wall. The additional output of the received signal strength value for each beam allows autonomous detection of reflectors by the navigation software. When beams strike a reflector, the values differ greatly from any other environment. This makes simple and reliable detection possible. In addition to the navigation aspects, there is no lack of safety: the compact RSL 400 safety laser scanner offers up to 100 switchable

protective and warning field pairs. Thanks to this high number, the protective fields can be adapted to the respective movement and load conditions as well as the speed of the vehicles in a number of ways. In 4-field mode with 50 switchable field sets, the device can also monitor up to four protective fields simultaneously. This enables safe and reliable reduction of the speed of AGVs. With a scanning angle of 270° , the RSL 400 can also cover the front and side areas of AGVs at the same time, i.e., around the corner.

With these features and a maximum operating range of 8.25 m, even large AGVs can be fully safeguarded with only two RSL 400s. The safety laser scanner is available in various models. The product range includes nine functional variants, three of which with data output for AGV navigation. All variants are available for the four operating ranges of 3.0, 4.5, 6.25, and 8.25 m. Models with PROFIsafe/PROFINET interfaces are also available. These interfaces make it much easier to integrate the devices, particularly when many different protective field configurations are used.

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The RSL 400 safety laser scanner combines safety with a detailed measurement value output for AGV navigation

The height of automation

Güdel's new telescopic axis delivers high payloads in low ceiling environments

The overall height of a gantry robot depends not only on the support structure but also on the length of the vertical axis when in the raised position. Low ceilings in some manufacturing environments combined with a long vertical axis will always present significant challenges to gantry designers. Güdel, however, now offers an elegant and practical solution that meets all requirements in terms of load capacity, service life, safety and ease of maintenance with its new optimised telescopic vertical axis.

Until now, telescopic axis design has had inherent limitations, including a reduced payload that can often be as much as 50 percent of that of a standard axis. In addition, older telescopic axis designs leave little room for enhancements to safety, functionality monitoring or any other configuration options, such as an integral rotate axis. To overcome the drawbacks and restrictions of traditional telescopic axes, Güdel has now launched a fundamentally

revised telescopic axis design featuring hugely improved performance in terms of weight capacity, dynamics and safety.

This new design is very much equivalent to a standard fixed axis, as both versions have exactly the same payload. However, in effect, the new Güdel axis has a 50 percent increase in payload when compared to their previous telescopic axis, thanks to its double profile tube construction. Other advantages include a second toothed belt, which provides additional security for the inner carrier profile and optical monitoring of both belts.

The new space-saving design also makes it possible to integrate a safety brake into the telescopic axis. The new variant is also very maintenance friendly, so changing rollers, belts or even the guide carriages is quick and easy.

This latest development from Güdel is a continuation of the company's philosophy of



Güdel's new telescopic axis design requires significantly less headroom but delivers the same payload capacity of a standard axis

ongoing product development and enhancement.

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New additions provide greater robot dexterity

New from RARUK Automation are two Robotiq innovations designed to make automated and even lights out production even easier. The first, Force Copilot, is an intuitive software development for applications that need force torque feedback and the other is the Hand-E gripper specifically developed for collaborative robots.

The sensing functions of the new Robotiq Force Copilot increase flexibility and reliability in machine-tending, assembly, finishing and pick & place applications. A suite of setup tools allows the user to hand-guide the robot on complex trajectories.

The software makes it easy to place objects precisely in jigs, trays and chucks and facilitates assembly applications through alignment, indexing and insertion functions. Finally, the intuitive interface unlocks finishing applications, with adjustable adaptive compliance and constant force for all robot axes.

Force Copilot is now a standard feature of the Robotiq FT 300 Force Torque Sensor

that can be seamlessly integrated into the second of the new additions to the RARUK Automation range. This is the new Robotiq Hand-E gripper whose compact and ergonomic shape makes collaborative robot hand-guiding safe and easy.

This latest product in RARUK Automation's line-up of adaptive grippers, is the first UR+ electric gripper to be developed to take full advantage of the benefits of the new Universal Robot e-Series. Its high accuracy and 50 mm parallel stroke make it perfect for precision assembly tasks, while its sealed design ensures reliability in the toughest manufacturing conditions.

Hand-E gripper comes with a 3-fingertip kit so automation engineers can easily integrate the gripper in their application. It operates with the same intuitive programming software as the other models in the Robotiq gripper range which enables full control over its position, force and speed.

RARUK Automation is a dedicated



automation company from RA Rodriguez that specialises in the supply of automation systems with a unique edge.

From collaborative 6-axis robots through to linear axis and controls, or complete turnkey solutions, RARUK's product programme allows it to provide OEMs, systems integrators and manufacturers with automation products that can be flexibly combined to provide application-specific, innovative, automated solutions.

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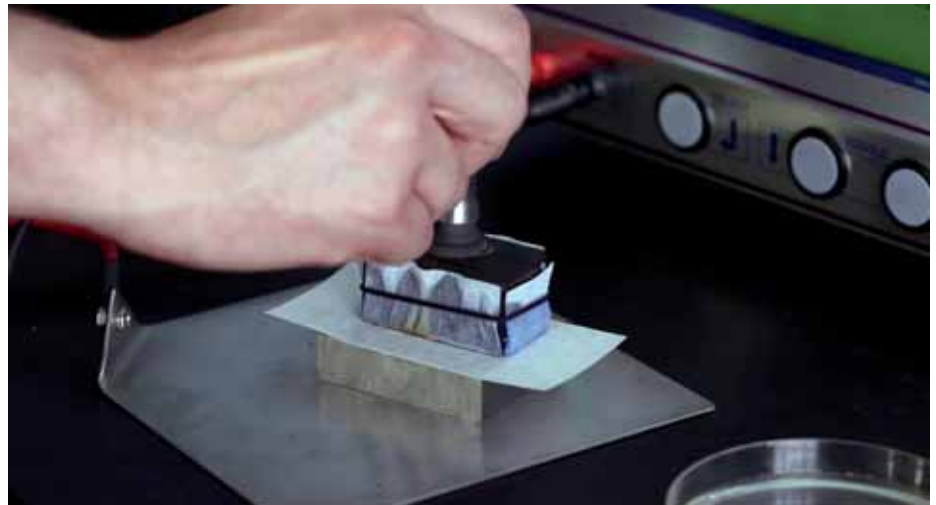
Beyond the laser: alternative component marking technologies for modern manufacturing

Fully automated marking systems that are integrated within production lines to provide complete product traceability generally use laser technology. However, for many applications this approach can be overly complex or expensive. Alastair Morris, sales director at Pryor Marking Technology offers some alternatives to laser marking to suit a variety of manufacturing processes.

Fast, accurate, high-contrast marking uses specialist laser systems to apply machine readable codes on components and raw materials. They are widely deployed in industry for identification, validation and appropriate routing to further downstream processing, assembly or inspection.

The clear, easy-to-read mark is deemed essential for industries that must achieve 100 percent traceability of manufactured parts. For example, aerospace, automotive and pharmaceutical industries are particularly well adapted to fast moving production lines requiring accurate 'marking on the fly' functionality.

When the manufacturing process involves some manual assembly, such a stop-start nature or confined to a single assembly cell, components are more easily marked when they are in a stationary position. While laser marking remains an appropriate solution for this type of manufacturing operation, such an approach might be deemed overly complex and costly. Production managers



would be better advised to consider alternative marking technologies that deliver a less complex and costly, albeit perfectly adequate, solution.

Most modern component marking standards use two-dimensional (2D) Data Matrix codes. Comprising of an arrangement of small dots or squares, marked as either a square or rectangle.

2D Data Matrix codes allow a lot of data to be included within a small area and can be applied using a variety of marking techniques, including dot peening, scribe marking and chemical etching. Let's take a look at some of these alternative marking techniques and discuss their advantages and disadvantages in more detail:

Dot peening is the most common and low-cost method of making a permanent mark on a component, with text, numerals and even images. It uses a stylus pin that is rapidly actuated to indent a series of dots on to the surface of the material. By rapidly repeating this and moving the stylus between each dot, both text and images can be applied.

Dot peen marking provides fast, accurate, low-stress marking and can mark through coatings or film on the material surface. Dot peening is frequently used by the aerospace industry, which

favours its low-stress engraving style. Material is displaced rather than being removed, significantly reducing the stresses on the component being marked.

Dot peening often uses an electrical solenoid to actuate the stylus, but pneumatic actuation can also be used where deeper or faster marking is required. The stylus is programmed to move in both X and Y axes, to create a two-dimensional dot arrangement of digits, text, logos as well as 2D Data Matrix codes.

While an excellent quality mark is obtained with dot peening, it is important that the workpiece is held firmly in place to ensure quality is maintained. Moreover, if a wide variety of workpieces are to be marked, then several interchangeable fixtures will be needed. Possibly requiring a magnetic chuck, or similar, to allow these fixtures to be changed over quickly and accurately.

Dot peening may mark a very wide range of materials, but some materials are easier to mark than others. The harder the material, the shallower the depth of mark will be. The type of material will also influence the life of the stylus tip, which may suffer accelerated wear or chip more readily the harder the material. To offset this, the angle of the stylus tip may be changed to reduce the chance of chipping. The stylus tip angle can also be changed to avoid chipping finishes off painted surfaces.

Another mechanical marking technique is scribe marking, traditionally the preferred method for automotive VIN marking. This is



where a pneumatically-driven pin is pushed into the metal surface to be marked. The pin is then moved through the metal to provide a continuous engraved line. Scribe machines can produce quality inscriptions with excellent clarity and legibility as part of a lower noise operation.

Electrochemical etching is a very quick and easy-to-use method of creating a mark using an electrolyte solution in combination with an electric current. It is a highly portable system and is one of the most cost-efficient methods of marking at low to medium production rates. Under software



control, the system is capable of creating many different mark designs, including alphanumeric data, Data Matrix codes and logos.

By selecting different output voltages and waveforms, a user can match the chemical etching process to the material being marked. This enables high contrast, high quality marks to be created on virtually all electro-conductive materials, regardless of surface hardness. This is only possible if there is no insulating medium, such as paint, between the etching system and conductive surface.

Electrochemical etching is often used in aerospace manufacture for component traceability as it is fully integrated with Data Matrix part marking software and does not deform the component being marked. This is particularly important in all applications with tight tolerances on surface treatment, such as marking very small pipes, shims and feeler gauges.

Many factors will influence component marking choices. While the ubiquitous laser-based system may prove irresistible where speed and clarity are concerned, there are reliable and often less costly and easier to implement alternatives available.

Dependent upon the nature of the manufacturing process and the components that need to be marked. A reputable supplier can always be called upon for practical advice and guidance when making those choices.

Pryor Marking Technology is a world leader in the manufacture and design of both traditional and innovative marking, identification and traceability solutions.

Founded in 1849 in Sheffield, UK, a hub of manufacturing and the birthplace of stainless steel, the company's success is built on providing solutions for all manufacturing industries, with extensive expertise in aerospace and automotive standards. Operating from sites in the UK, USA, France and India, Pryor serves an extensive customer base, supported by a comprehensive distributor network in countries across the globe.

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Electrochemical marking still makes its mark

Electrochemical marking is recognised as the only method of marking metal without distortion, which is why it is still the preferred option for many applications, including some critical aero-engine components, surgical implants and thin walled section parts, although it is widely used to mark any conductive metal surface.

It originally gained universal acceptance within the aircraft industry for the marking of engine components, undercarriage and airframe parts, particularly due to the fact that the marking process has no measureable detrimental effect on the mechanical properties of the material.

Electrochemical marking is permanent because it is created by etching out a few microns of metal and then plating on the etched surface a stable compound of the base metal. In most cases this is an oxide, giving a high contrast black mark on many metals. A below surface etch mark can also be achieved or a combination of the two. Marks are produced extremely quickly, between 0.25 and 4 seconds for most metals. Deep etching takes a little longer, but marks can be deep enough to be read through paint.

Nowadays, it is commonplace for a datamatrix 2D barcode, to be used when marking a wide variety of parts, including jet engine components, within aerospace. Complete life traceability is often required and Universal Marking Systems (UMS) has developed a software driven electrochemical marking system for mark and read applications.

The software is fully featured and contains a great deal of control and security. Once the datamatrix code and/or human readable text has been created, it is output to a

300 dpi quality thermal printer utilising a disposable instant stencil paper ideal for variable information. The software can download the correct marking settings to the marking unit to eliminate the possibility of operator error.

A barcode reader can also be used to scan codes from a job card if required, or data can be imported from a spreadsheet or database. Complete self-contained marking kits allow the user to create their own stencil and apply the mark to the component all within a small workstation area.

While electrochemical marking is usually hand applied, UMS has recently launched an upgraded version of its ME3000P air jig which enables marking to be semi-automated for batch marking. It has a guided air cylinder with a 50 mm stroke as standard and a generous 180 mm throat depth to allow different sized components to be marked. A stepper motor driven electrolyte pump for precise control of electrolyte dosage during marking makes it a clean and easy process. UMS also produces low cost custom fixturing for both positioning and holding the component for marking and also for consistent stencil alignment.

High-quality, long-life photographic stencils are produced at UMS to customers exact requirements. These high-quality stencils will each produce hundreds of marks and are ideal for logos, graphics and other data that does not change frequently.

The process is environmentally friendly as it uses water-based electrolytes and



neutralisers. UMS manufacture two ranges of electrolytes, a general engineering range for a wide variety of metals and a high purity grade where each batch is tested by an independent lab for purity levels. This is often a requirement within aerospace applications to ensure that the electrolytes meet the required purity levels for the most stringent aerospace standards.

Electrochemical marking continues to offer an extremely, reliable, low-cost, high-quality marking with the versatility to mark both the smallest component right up to the largest fabrication whether it be cylindrical, thin walled or even fully hardened steel, often with faster marking speeds than laser. It shows such versatility that it is widely used across the whole of industry.

Universal Marking Systems Ltd manufacture and supplies, globally, a range of electrochemical marking equipment and accessories under the Metaetch brand name, as well as being sole partner in the UK for the Technomark range of dot peen and fibre laser systems.

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Complete range of marking technologies

Starting over 30 years ago, Technifor has developed one of the most comprehensive ranges of marking equipment on the market today, comprising laser, dot peen, scribing and mechanical engraving.

Four different laser technologies are now available from Technifor: fibre, hybrid, CO₂ and green lasers. This complete range enables the marking of virtually any material from metal to plastics as well as organic, all with a marking speed of up to 10,000 mm per second.

Green lasers, often referred to as 'cold marking', are the lesser-known type of lasers. With a 532 Nm wavelength, the green range can mark materials that would not normally react to infrared wavelengths, from rough to the most transparent plastics, reflective metals, copper, silver, gold, ceramic and more. In addition, a 20 µm diameter beam enables precise marking of minute text, graphics or 2D codes.

Fibre technology is ideal for fast or deep marking of metal, whereas hybrid provides real versatility, able to mark a wide range of plastics and metals, including precious metals and alloys. Finally, CO₂ lasers are

predominantly used on organic products such as wood, glass, rubber, ceramic and many plastics.

Technifor lasers are designed to be either used as benchtop units, with several enclosures of varying sizes available or integrated directly onto production lines and controlled by PLCs through Ethernet, digital I/O or RS232 connection. The fibre series is particularly suited for use in harsh industrial environments with an IP54 rated head, sealed and protected from dust and liquid projections.

Technifor lasers feature technical innovations with a programmable focus to mark on different planes without any mechanical adjustment, automatic focus to automatically adjust laser focal distance to part height variation and vision manager to detect part positioning, mark parts, check and validate marking.

Technifor's application department will test mark samples with different technologies and therefore be able to advise on the best suited systems, whether laser or mechanical engraving. Technifor's range of mechanical dot peen and scribing



markers are available in either portable, benchtop or integrated configuration. They are fast, easy-to-use and provide a cost-effective alternative to laser engravers without compromise on quality and reliability.

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Outstanding quality laser marking with picosecond fibre laser



At the top end of high-precision laser processing, the new PIRANHA® Multi with ultra-short-pulse fibre lasers is the latest generation laser product from ACSYS Lasertechnik UK. This compact picosecond fibre laser is ideal for fine cutting of ultra-thin foils, high-precision micro machining of thin layers and the removal of conductive oxide, anti-reflective, nitride or metal layers.

The picosecond laser capability, now available in the PIRANHA Multi is able to produce corrosion-resistant black marking especially on stainless steel, where the mark can be read with good contrast from any angle. Optical effects created on the surface microstructure generate the contrast without any melting burrs, making this ideally suited for UDI (Unique Device

Identification) marking of surgical or medical devices for enhanced traceability and having the permanence to withstand unlimited steam sterilisation (autoclaving) cycles.

Delivering a pulse energy of 25 μ J, with pulses shorter than three picoseconds, the laser delivers ideal marking conditions and is capable of "cold" laser processing for micro machining taking advantage of the ultra-short-pulse. This transfers the high-intensity energy in less than the relaxation time, vaporising the material almost instantaneously with virtually zero melting. ACSYS recommends the picosecond fibre laser for processing of high-precision glass, marking of sapphire LED wafers and polymer processing.

ACSYS Lasertechnik UK's Mick Hemmings says: "The new PIRANHA Multi with the latest generation of ultra-short-pulse fibre lasers offers



High contrast marking on metals using picosecond laser pulses extends viewing angle and improves quality especially for medical device applications

completely new and innovative laser material processing capabilities."

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Advanced performance laser marking at an entry-level price

Compact high-dynamics scan head for labelling applications

Leading OEM laser scan system manufacturer SCANLAB GmbH is expanding its lineup of entry-level scan heads with the new basiCube 14. This compact-class scan system features excellent price/performance and a 14 mm aperture for high-precision marking using small spots. This makes it ideal in electronics labeling applications.

The consumer goods and electronics sectors are governed by high volume production and unrelenting price pressure. In manufacturing, every core component is subject to demanding expectations



regarding throughput, reliability and low cost.

SCANLAB is now extending its product portfolio via the ultra-compact basiCube 14 scan head, a price-effective variant that features a larger 14 mm aperture and mechanical compatibility with the well-established SCANcube series. This new model assures 600-cps writing speeds, additional productivity can be realised through its automated on-the-fly functionality. It will be manufactured in Germany under strict quality standards.

SCANLAB exhibited at LASER World of Photonics China 2019 and will also feature at LASER World of Photonics 2019 from June 24-27, 2019, in Munich (Hall A2, Booth 225).

With over 35,000 systems produced annually, SCANLAB GmbH is a world-leading and independent OEM manufacturer of scan solutions for deflecting and positioning laser beams in three dimensions. Its exceptionally fast and precise high-performance galvanometer



scanners, scan heads and scan systems find application in industrial materials processing and the electronics, food and beverage industries, as well as biotech and medical technology.

For over 25 years, SCANLAB has secured its international technology leadership through pioneering developments in electronics, mechanics, optics and software, as well as the highest quality standards

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www.scanlab.de

Laserax launches inline laser marking and laser cleaning solutions

Manufacturers of parts used in the automotive industry can rely on Laserax's complete laser marking solutions to provide world-class traceability to their customers.

Global manufacturers are facing increasing pressure from their clients in the automotive industry to provide part-to-part traceability. Being able to trace every part inside their production facilities with a unique, permanent, scannable barcode provides data-oriented manufacturers invaluable information for process control.

Laserax has developed a complete line of laser markers that enables direct part marking to help manufacturers trace every product from early production steps to the assembly of the final products and beyond.

Manufacturers can count on Laserax's field-tested inline laser marking solutions, which have been designed for optimal robustness, performance, reliability, and safety. Laserax's laser technology experts help clients take the burden of laser safety certification off their shoulders.

Laserax has developed three laser marking machines that are being used in the harshest industrial environments, such as

manufacturing plants for automotive parts, diecasters, extruders, foundries and more:

The Open-Air Machine is a no-nonsense machine used in automated production cells that is serviced by an industrial robot. The robot holds the part in front of the machine during the marking operation. When the marking is complete, the robot can resume the production cycle.

The Rotary Table Machine is a sophisticated solution for automated laser marking of parts. Its feeding system allows the marking to be accomplished in hidden time.

As the marking of a part starts inside the laser safety enclosure, a part that was previously marked is unloaded and brought by a robotic arm to the following station. The robot can then load the RTM with a fresh part to be marked.

The Rotary Table Workstation is manually fed by an operator, while everything else is automated. It ensures reliable and



consistent markings. The safety of the operators is ensured through best-in-class machine design.

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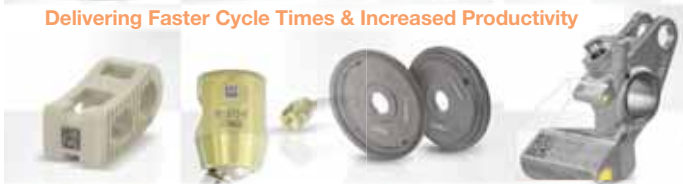
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FOBA Laser marker ensures fast batch processing and high-contrast marks on beverage can lids

With over twenty years' experience in the manufacture of aluminium "Easy Open Ends", the Chinese Guangdong Transshell Packaging Company Ltd is among the three leading can parts suppliers in China. Transshell's annual capacity has reached more than five billion pieces.

As an approved supplier to various well-known brands with world-class production lines, Transshell places high demands on the marking of its aluminium can caps, not only in terms of quality and contrast of the 2D codes marked on the lids, but specifically regarding efficiency and economy of their high-speed large-batch production.

The solution to Transshell's demanding marking requirements is based upon FOBA's high-power fibre laser marking technology, which is available in the UK and Ireland from Bromsgrove-based TLM Laser.

Transshell, as an OEM supplier, marks aluminium beverage can lids with 2D codes and Chinese characters for its customers. The 2D codes are applied on both the underside of the lids as well as on the outer surface. When the end-user opens the lid, they discover a QR code for a lottery game. Scanning this QR-code with a mobile device, allows the customer to take part in a competition. Transshell places high demands on laser marking technology. To keep pace with high-speed batch processing, the laser needs to be able to mark a part in 25 milliseconds or less, to achieve the throughput of 750 parts per minute. In addition to the requirements for high-speed, the laser marker also had to achieve the highest quality standards. Although very small, the 31-digit codes on a



7x7 mm area, achieved on collared aluminium by laser paint removal, must allow for fast and easy scanning by the end-user.

Code positioning is also important and each code had to be applied in the correct position on the can lid. The marking process was expected to be robust and stable without the need for time-consuming maintenance and reliable marking results had to be guaranteed throughout the entire high-speed production process.

To achieve the exacting standards required to mark the lids with the complex scannable content, Transshell was seeking to identify a system that would deliver the minimum marking time per piece, stable results over time and the best mark contrast for enhanced productivity in a high-speed

production environment. FOBA's sales and application engineers already had previous project experience with marking aluminium cans, so they were able to offer compelling marking results during a trialing and sampling process.

The trial process consisted of 16 separate product marking test cycles, during which a number of changing customer specifications were accommodated. Software features were adapted, varying laser parameters such as laser power, different wavelengths or laser sources were compared and the special characteristics of the substrate were also taken into consideration. Finally, all parameters were aligned for optimum marking results and the laser marking process for aluminium can lids was accelerated significantly, beyond Transshell's



requirements, using an innovative new laser marking method.

The marking solution delivered by FOBA is based upon the recently released FOBA Y.1000 high-power fibre laser marker, which proved to be the most efficient at 30 percent faster when compared to other suppliers. It was the only marking system that could match the highest speed cap press production technology on the market.

The laser marked 2D codes are either applied on the underside of the lid and become visible once the lid is opened, on top of the lid outside the can, or they are applied on top of the can and become visible once the lid is removed. The codes are made up of 31 digits per line on an area of 7 x 7 mms. On the painted material, the high-speed laser marking process removes paint and creates sharply contoured dots on the aluminium substrate.

The Y.1000 laser, with built-in productivity, enables high line speeds of up to 600 m/min. A 498 mm wide marking field, with a f=420 mm lens, provides an extra-large marking field range, which results in more throughput, especially for mark-on-the-fly applications. The compact mechanical design enables easy integration

in tight environments. Flexible configuration and interfacing options speed up and facilitate line and OEM integration. The virtually maintenance-free, air-cooled laser ensures reliable performance and minimises downtimes, which is another benefit for high-productivity.

A datasheet on this application can be downloaded from the FOBA website by visiting:

<https://www.fobalaser.com/applications/materials/metals/#c7072>

FOBA laser marking and engraving technology is available within the UK and Ireland from TLM Laser, who will be happy to provide advice on laser marking applications. The company also represents a wide range of leading laser technology suppliers for applications including: welding, cutting, hardening, cladding, marking and 3D additive manufacturing.

Founded in January 2006, TLM Laser Ltd is a dedicated laser service company, providing a second to none service and maintenance program which it can implement to best suit its growing customer demands. The company prides itself on



being a solutions company. Through its long-term experience and cutting edge expertise, it is able to understand its customers' needs and tailor its services to meet them.

TLM Laser
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SIC Marking launches the new XL Box

The XL Box marking laser has been improved to meet new users' requirements. It keeps all the advantages that have made it a best seller and a key reference for integrators, together with an unrivalled quality-price ratio in the market.

A powerful SIC Marking fibre laser source (20, 30, 50 W), already renowned for its reliability (MTBF 100,000 hours), can perform any kind of marking: text, logo, 2D Datamatrix etc.

A solid housing with an automatic door gives access to the marking area on three sides and Laser Class 1 certified security (EN60825-1), while an A standard chassis allows immediate integration into the production line.

Major innovations that have been specially developed for integrators include the new FU4 laser controller rack. This meets 13849-1:2015 standard requirements and has been awarded the maximal PL(e) (Performance Level =e) to manage the safety loops of the automatic door and emergency stop. This excellent level grants

the user the full safety of our laser and makes it one of the safest lasers in the market, as competitors' products are usually awarded a PL(c) level.

The controller includes a touch screen to give easy access to menus. This allows for simple and user-friendly parameter setting and a simplified diagnosis aid.

Finally, all fieldbus communication cards (ProfiNet, Ethernet IP, etc.) are available for easier integration into your network or connection with your PLC.

A robot mode

By designing this new operative mode, SIC Marking has taken charge of Laser Class 1 security. The laser housing can be directly integrated into the production line or the robotic cell through an interface in touch with the line's PLC.

Easier integration (shorter study and installation delays) and reduced costs of the whole laser marking function are therefore the greatest assets of the new XL Box in robot mode.



Various additional options are available such as 3D marking or integrated Datamatrix 2D code reading. In the case of specific requests, SIC Marking will dedicate a skilled project team made up of 20 engineers (mechanical, automation, IT, etc.) to meet all customer specifications.

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“Poly, poly or what?”

How a trade show initiated a brilliant idea

In the next part of this (almost) historical review, Horst Lach recalls a brilliant idea. Between 1974-1976 polycrystalline cutting materials diamond (PCD) as well as CBN (PCBN) could show their potential for the first time. As a result of the hardness of diamond combined with the sharpness for machining tasks, the superiority of PCD was displayed early on turning, milling, drilling and cutting. Nevertheless, this particular cutting material was at that point still a niche product. The world of global players within the automotive industry had not yet discovered it or had not yet realised its cost-cutting potential. There were several reasons for this.

When the polycrystalline diamond was first introduced to the industry in 1973, tool manufacturers had only been able to grind carbide, a similar cutting material, efficiently in a cost-effective way for about five years. Again, diamonds, to be more exact the grinding wheel that was available for carbide cutters at the time, played a role in this.

Until around 1967, diamond wheels were only referred to as polishing wheels, and therefore not suitable for pre-grinding processes. The reason for this was that the synthetic and natural diamond grains in resin-bond grinding wheels would fall out of the bond after approximately a third of their product life. Only after the diamond grains were coated with nickel cobalt, an innovation of the company Asea, was it possible to create a lasting, coralline surface connection between the resin bond and the individual diamond grains. Pre-grinding of carbides was now possible and initiated a



Unmachined synthetic cutting inserts - developmental status as of 1973. The shown segments with 60° and 90° angles were mechanically cut out of PCD blanks (of approx \varnothing 3.4 mm) with diamond cutting wheels

boom-like upswing of the carbide industry. It could be questioned whether polycrystalline cutting materials came too early for the industry.

PCD - too early for many

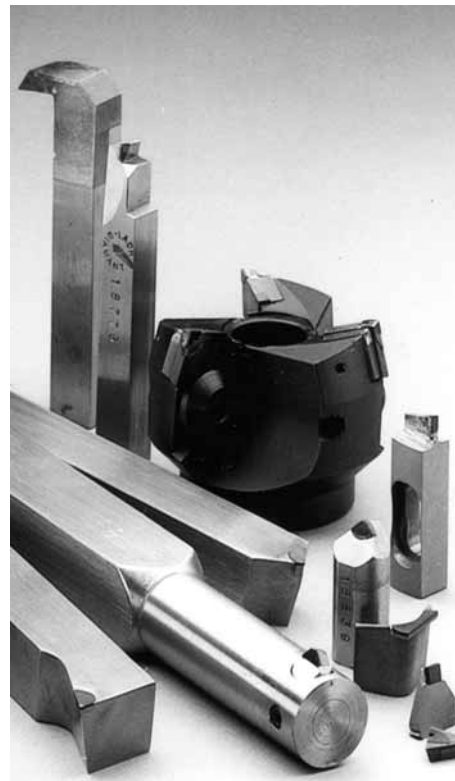
At the beginning of the 1970s, turning machines with microprocessors for CNC production did not exist and first attempts were made about 1978. Until then, turning was mostly done manually, outside of a few exceptions with perforation stripe controls. For the carbide industry, especially for the booming manufacturers of carbide tools, the synthetic and at the time still controversial diamond material PCD definitely came too early.

In the early to mid 70s, the question was what to do with a cutting material advertised by manufacturer General Electric as a performance-enhancing material for machining non-ferrous metals. The “hard metal” cutting material had only recently been “defeated”. With non-ferrous metals, where were the potential customers asking for a cutting material for machining of aluminium, superior to carbide and with a much longer tool life? At the time, there was no automated production, as microprocessors were not introduced into the world of machining until 1978, with one of the first turning machines. The material aluminium had to wait some time until its successful breakthrough into the world of motor manufacturing, in other words mass production of automobiles.

The grinding of natural diamonds was not only complicated but also, and even more so, was the grinding of “non-growing” polycrystalline diamonds. Therefore, the diamond experts were expected to deal with this “exotic” PCD.

LACH DIAMANT concentrated more and more and with increasing interest on this new cutting material. Due to our decades long experience in manufacturing and service of turning tools, made of natural diamonds, for overturning copper commutators, for customers like Bosch, Siemens and AEG, we were made aware of manufacturing problems during the production of raw commutators and the solution found in PCD.

PCD tools had been developed based on



Soldered PCD mount for external and outer turning and boring as well as for cutter heads

the earliest requirements and focused on the use of turning tools with soldered cutting segments with 60° or 90° angles.

Even though milling with PCD was already a highlight of the Hannover Trade Show in the spring of 1974, at the end of the 70s it was still limited to carbide plates which were clamped into cutter heads. They consisted of a soldered PCD cutting edge and small shank tool with at the most three cutting edges.

All available PCD cutting edges had to be tediously cut out of \varnothing 3.4 mm, or at the end of the 70s, \varnothing 6.4 mm blanks, which left only little scope for spectacular depth or width of the cuts. Furthermore, the prevailing textbook opinions about diamonds were still in too many heads. Diamond was considered only suitable for polishing gold, silver and some non-ferrous metals, but not suitable for uninterrupted cuts. This was another obstacle during the market launch of polycrystalline cutting materials.

Convincing at productronica

The announcement of a show which was

until then unknown to me, proved to be a turning point for the implementation of polycrystalline diamond tools. productronica 1977 in Munich was announced as a component show for the electronic and circuit board industry.

The basic material used for circuit boards was glass fibre reinforced plastic (GRP). We had successfully cut this with PCD, even dust-free. In order to demonstrate this successfully at the trade show, a demonstration machine was needed. We found it at former AEG in Seligenstadt where they manufactured circuit boards for domestic use, with a Swiss machine from manufacturer Amacher. Three processes could be shown on this small HAMBА precision machine: cutting, scoring and edge machining. Excellent. We registered for the show. We placed an internal work order for the three PCD tools or rather saws we needed.

The only objections were raised by production: "How are we supposed to grind these rotating tools. It will take forever!" Indeed, to finish 12 teeth, for example, it took 35 hours of grinding time. But I reminded them that they had always found a way in the past.

productronica 1977 was at first a huge success for LACH DIAMANT. At the time, there was a growing demand for electronic circuit boards and all the big names were present and gathered around the small Amacher machine to marvel at the precise, highly accurate and dust-free machining of

PCB, the basic material of circuit boards. I still remember to this day, the experts at Siemens and NCR who immediately thought of diamond saws for packet machining of 300 and 350 mm ø, and who spontaneously ordered samples for further experiments.

It could have been so perfect. Machining of circuit board materials would have been possible in a more efficient way since then if only production has not said that they could either make scorers and saws for circuit boards or continue to serve customers like Bosch and Kautt & Bux with commutator diamonds.

That was it for rotating PCD tools. This grinding technology delivered only 12 PCD teeth in 35 hours. The initial trade show success was gone. The real culprit was the beastly polycrystalline "non-growing" diamond material itself and even diamond cutters with years of experience capitulated.

The turning point

Then, suddenly at the end of 1978, a second turning point would finally lead to success. Once again via an announcement, this time in a sales advertisement for a spark erosion machine by the company MATRA in a Frankfurt newspaper.

I had never heard of it. A spark erosion machine? But I did remember my father mentioning that electricity played a role during the cutting of natural diamonds on the obligatory cast discs.

We had a good relationship with MATRA Frankfurt, at the time a manufacturer of



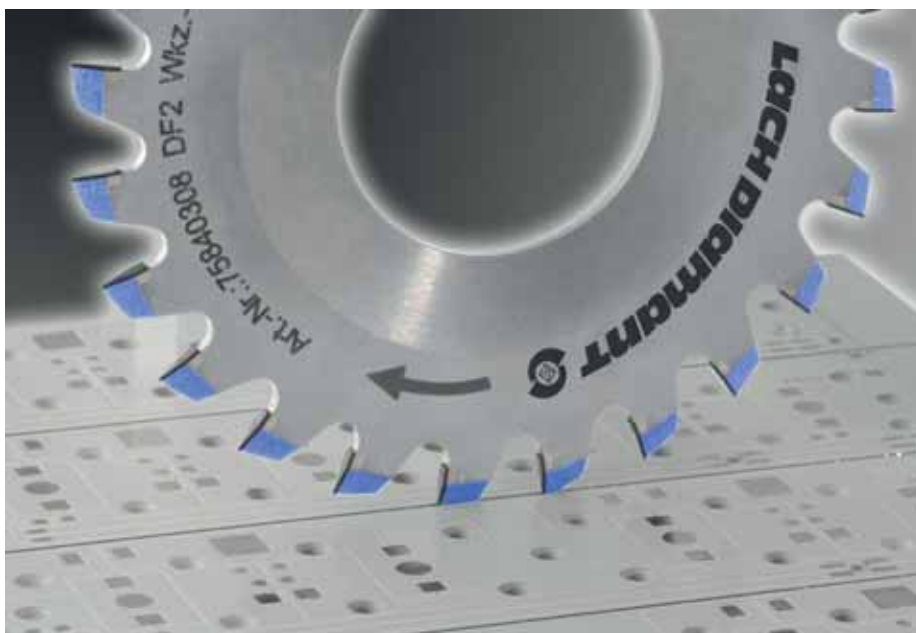
1977 at productronica in Munich - the worldwide first demonstration of PCD cutters, saws and scoring saws for PCB circuit boards on an Amacher precision machine, type Hamba

"state-of-the-art" surface grinding machines. LACH DIAMANT was permitted to use these machines especially for experiments with CBN Borazon grinding wheels.

On visiting the MATRA facility, we stood in front of a machine that I would call some sort of "sinking machine. The PCD sample we handed over for the "spark test" was carefully mounted and disappeared in a "brew" which I now understand as a sort of dielectric. We took turns to examine the changes with a magnifying lens. Nothing happened, not even during the next five minutes. We were already on our way out of the hall, when I suddenly discovered another machine in a corner. It looked slightly different, mainly because of an additional "tower-like" structure. As we were already there, we mounted the sample on the FANUC machine and it worked right away. The hot wire actually cut the promised profile out of the PCD and formed it.

This visible success surpassed all our expectations. The experiment had shown us how to produce profiling tools and mills under the influence of spark erosion, a discovery that would show its full value for the future only two weeks later, but first of all I had to visit our patent lawyer on the next day. The patent number 0010276 "Herstellung beliebiger Profile in polykristallinem synthetischem Diamant mittels Funkenerosion" was granted and published on April 21st, 1982, as one of the first European patents.

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LACH DIAMANT «DreboBlueCut» PCD Scoring Saw - developmental status as of 2018 - "World Running Champion" not only during PCB machining but also (as shown in the photo) during the scoring of aluminium IMS circuit boards

Dynamic savings with Walter's dynamic milling strategies

Tooling expert Walter GB says companies of every size can cash in on the benefits of high-dynamic milling, i.e. higher process reliability and faster, more cost-effective cutting, by using higher speeds and feeds, as well as reduced 'free travel' of the milling cutter and longer tool life.

Compared to high-performance cutting (HPC), the advantages of high-dynamic cutting (HDC) can be realised when milling components of every size and in all materials, says the company.

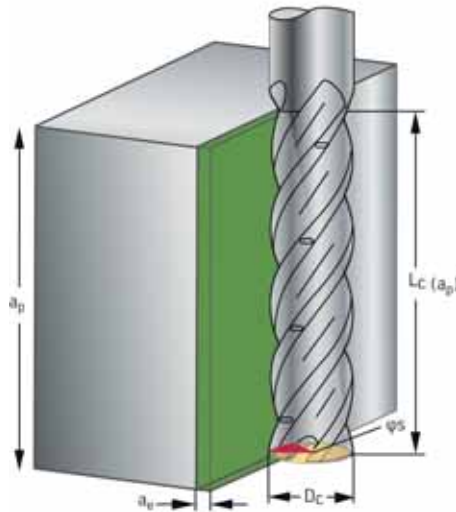
The main differences between conventional HPC and HDC are in the movement of the cutter and the forces generated. During HPC milling, the tool takes relatively small depths of cut; during HDC milling, the machine and its CAD/CAM functionality adapts the paths so that the tool delineates during machining to the shape of the workpiece and takes greater depths of cut.

The tool engagement angle is usually very large during HPC milling, so the process forces are accordingly high, which not only creates significant tool wear but also places undue stress on the machine spindle. The tool engagement angle for HDC is normally small, so the forces which impact the tool and machine are much lower.

Higher cutting parameters, less free travel and increased process stability result in a much higher metal removal rate for HDC milling.



Walter's MD133 Supreme is ideal for high-dynamic milling applications



Dynamic milling achieves maximum metal removal rates (Q_{max}) with small radial widths of cut (a_e), a large axial depth of cut (a_p) and a constant average chip thickness (h_m). The engagement angle (ψ_s) is adapted to the material to be machined

The cornerstones of HDC are the tool, machine, CAD/CAM system and the workpiece, but the strategy is successful only when all four are in synchronisation.

Cutting values, i.e. the maximum permissible radial width of cut and engagement angle, are determined by the material, while workpiece geometry has a direct bearing on the length of cut and tool diameter. The CAD/CAM software calculates all important parameters such as milling direction, optimum path guidance, adherence to the defined maximum engagement angle and average chip thickness, then adapts them to the application.

The milling machine is 'dynamic' when it has excellent acceleration characteristics around tight corners, short calculation and switching times, plus a wide range of speeds.

Tool selection is based on the machining operation and in accordance with the parameters predetermined by the material.

Walter works closely with CAD/CAM system suppliers and its customers to find ideal solutions to individual milling tasks by applying its Engineering Kompetenz strategies to select the correct tooling

(Walter's MD133 Supreme solid carbide cutters, for example) and by using the Walter GPS software to determine the most cost-effective machining solution based on tool and cutting data recommendations.

Walter AG was founded in 1919 and is one of the world's leading metalworking companies. As provider of specialised machining solutions, Walter offers a wide range of precision tools for milling, turning, drilling and threading applications. Walter works together with its customers to develop custom solutions for fully machining components for use in the aviation and aerospace industries, as well as automotive, energy and general engineering.



Walter has specifically developed a range of solid carbide cutters for dynamic milling

The company demonstrates its Engineering Kompetenz at every stage of the machining process. As an innovative partner capable of creating digital process solutions for optimal efficiency, Walter is pioneering Industry 4.0 throughout the machining industry. With over 3,500 employees worldwide, together with its numerous subsidiaries and sales partners, Walter AG serves customers in over 80 different countries.

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Power skiving solution 2-3 times faster than gear shaping

Sandvik Coromant enables single setup gear production on a machining centre

A new power skiving solution comprising CoroMill® 178 and CoroMill® 180 cutters from Sandvik Coromant is being released to help automotive manufacturers complete gear and spline components in one set up on a multi-task machine or machining centre. Skiving processes are many times faster than shaping and more flexible than broaching and are fast becoming an efficient and flexible alternative for gear and spline production.

The power skiving solution from Sandvik Coromant comprises solid bore, solid shank and indexable cutters. CoroMill 178S (solid carbide) is for use in applications where high volume, high rpm machining with long tool life is required, while CoroMill 178H (powder metallurgy HSS) is for general use on shoulders or small diameters. These tools offer the highest tool accuracy regarding run-out and pitch compared with indexable tools, providing a better finishing profile of the gear and spline. Reconditioning can typically be performed up to 10 times depending on the quality of the tool.

CoroMill 180 indexable cutters are for high-volumes, roughing on large range of gears (module 2-9). Among many notable features is a positive rake angle for light cutting action and the potential for dry machining, which saves on coolant costs and helps to protect the environment.

"The power skiving cutter selection can provide both high output and an optimised finishing profile," says Harish Maniyoor, global product manager, Industry Segment Automotive at Sandvik Coromant. "Coupled with the ability for one setup machining, the tools improve quality, and save time and cost. In fact, cycle time reductions of around 50 percent can be anticipated compared with gear shaping, helping to reduce the cost per component considerably. It is also worth noting that skiving is more flexible than hobbing for producing new, compact automotive transmissions."

All tools are made as engineered solutions to fit precise customer needs. With the correct design, process at production levels will prove up to 15 times faster than



shaping, and more flexible than broaching with better quality. The development also brings greater process flexibility to end customers, moving production to in-house machining centres and away from dedicated machine tools at suppliers. Moreover, process reliability will increase, with fewer unplanned stops.

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Time to take control

Tool inventory and management can be a costly and time-consuming process for any manufacturer. Having greater control over what cutting tools are onsite, how many are available, who is using them and when to re-order, offers significant support and accountability.

Dormer Pramet's ProLog Vending system provides such assistance to hundreds of companies, in numerous countries, offering individual compartment control in a standard shop floor cabinet at point-of-use.

In addition to the standard check-in/check-out features, added business rules and reports are available to provide detailed analysis of performance. In addition, users can automatically "age" and lock-down tools based on specific criteria, set up alert notifications when a tool has reached a defined setting and access full audit history by asset and user.

SupplyBay and SmartDrawer are Dormer Pramet's most popular vending devices. SupplyBay is engineered for industrial environments to deliver reliable high-volume dispensing for a wide range of tools

and supplies. Its large dispensing door gives easy access to load and refill.

The versatile SmartDrawer allows users to choose the best level of access for each application. It can be a stand-alone unit or combined with other devices for a tailored solution, offering a mix of compartment options between two to 128 positions in each drawer.

To enhance its vending offer, Dormer Pramet has launched several new machines, giving even greater choice to suit individual requirements. The new additions include SaveRing, SaveBin and SaveRent. All the systems help companies move away from peg-board or open access methods.

SaveRing is a versatile vending machine which stores and distributes up to 540 unique items. It has four key functions to distribute, rent, return for regrinding or reserve products for up to 30 days.

SaveRent is a locker-type tool renting and monitoring system. It allows the storing, distribution and return of valuable, frequently used tools and items. Each transaction is saved and recorded when



each user accesses an item. With SaveBin, employees return used or contaminated items, with the unit taking a photo of the product and logging the transaction to the employee. The system automatically alerts if waste levels reach a pre-defined number.

All machines are supported by industry leading data management software. It's intelligence engine drives all devices, connects with distributor information, integrates with customer-based ERP systems and enables access to real-time information and administration on any web-enabled device.

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Guhring publishes new threading catalogue

Guhring has now extended its extensive range of threading products with the arrival of the new Pionex threading line. The new generation of fluteless and cut, machine taps have been developed to reduce axial forces and torque by up to 30 percent while improving surface finishes and tool life.

The new generation of Pionex machine taps now appear in a new 20 page catalogue that is available to download from www.guhring.com. Guhring UK's sales manager, Dave Hudson says: "We have Power taps, the SL tap range plus a complete tapping catalogue, which can sometimes make it difficult for the engineer to determine the most suitable variant for specific applications. Over a period of time, we have developed a threading range with various geometries, optimised them and put them into a range that covers over 85 percent of the industry applications. This is all now in the new Pionex threading catalogue."

The new Pionex Series includes 45-degree helix geometry with a reduced rake angle, back tapering and improved relief. All this culminates to provide unprecedented performance and swarf removal. With a h6 shank tolerance for use in all types of clamping chucks and the Forming tap that has a new lubricating groove to improve thread formation, the next generation Pionex is an impressive threading prospect for any machine shop.

Dave Hudson continues: "We developed a new profile of fluteless taps together with enhanced geometries, coatings and surface finishes and this has resulted in much longer tool life and massively reduced cutting forces. The new extension to the range is the cut tap with a range of spiral point and spiral flute, which helps the end user with swarf control.

"The biggest issue with tapping is always swarf control and more taps break through poor swarf control than for any other reasons. This is particularly the case in retraction when the tap is in reverse. The biggest challenge is always to make the swarf fall away from the tap rather than get wrapped around it and we've certainly achieved that with the new Pionex."

The Pionex range is manufactured from HSS-E or PM30 with Guhring's new aluminium nitride or zirconium coating technology. "The diverse capabilities of the Pionex range through its innovative swarf controlling geometry means that this new Pionex range can be applied effectively to 85 percent of targeted applications that range from standard low carbon steels to the tougher steels and

stainless steels. For exotic materials, we have a very diverse range that caters for all types of heat resistant alloys."

The new Pionex is available with metric threads in course or fine pitch as well as UNC, UNF, BSP in all diameter and pitch variants with a complete line of special thread designations also available upon request.

Guhring Ltd
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www.guhring.co.uk



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Triple edge drilling now for all materials and applications

Tritan drills from MAPAL have established themselves across the board due to their great economic advantages and now there are four new designs to complete the range of products.

The Tritan-Drill-Uni for machining steels, stainless alloys and cast materials has been further developed and improved with regards to its tool geometry. The new Tritan-Drill-Uni-Plus has a clear advantage over the previous drill for universal use. The new finished groove profiles improve chip removal and a new wear-resistant coating increases tool life by up to three times. In shank form HA, the Tritan-Drill-Uni-Plus will be available in diameters from 4 to 20 mm and in lengths of 5 x D and 8 x D as standard.

For use in aluminium and cast materials, MAPAL now presents the new Tritan-Drill-Alu and the Tritan-Drill-Iron. Thanks to innovative tool geometries, the drills also achieve significant increases in feed rates and performance in these material groups. The Tritan-Drill-Alu has a polished groove profile matched to aluminium materials. Large chip spaces and a special, sharp cutting edge preparation ensure optimum

chip formation and reliable chip removal. For cast machining, the Tritan-Drill-Iron impresses with its corner radius design that demonstrates greater stability and wear resistance of the cutting edge. In conjunction with a wear-resistant coating, cast materials can be optimally machined with the Tritan-Drill-Iron. Both designs are included in the range of products as application-specific special solutions.

Finally, the Tritan-Step-Drill-Steel was developed for stepped bores in tapped drill holes. Until now, only double edge drills were available for these machining operations. The flat chisel edge in the centre of these tools make them oscillate up and down along the chisel edge, which leads to a high load on the cutting edges and guiding chamfers and thus to poor results with regards to circularity and cylindrical form. Now the Tritan-Drill-Steel, utilises triple edge technology that eradicates this issue.

The new Tritan-Step-Drill-Steel has an innovative point thinning and finely ground chip flutes, so the chips are rolled tightly and broken. The chips are reliably removed through the relatively small chip flute. The



crowned cutting edge with a pulling cut from the centre to the stable cutting edge reduces the load and makes the drill robust. In conjunction with a wear-resistant coating, the machining results of the Tritan-Step-Drill-Steel are excellent, especially when compared to conventional double edge step drills. The Tritan series of drills can achieve double feed rates, while simultaneously increasing tool lives.

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ITC rounds on trochoidal milling strategies with new 5031 Series

With trochoidal milling being the current buzzword among the cutting tool fraternity, Industrial Tooling Corporation (ITC) Ltd has now expanded the already unrivalled section of its 2019 product catalogue that is dedicated to this machining process.

For engineers less familiar with the process, Issue 14 of the ITC product catalogue identifies the benefits and potential savings that can be achieved with trochoidal milling. This is followed by an extremely comprehensive line of applicable products that will deliver astounding results using the trochoidal machining process.

To complement the trochoidal milling benchmark 5021 Series, the UK manufacturer has now launched its new 5031 Series of square-end and corner radius 5-flute end mills. This Cupro coated stub length end mill has been introduced to build upon the already staggering rigidity and success of the existing 5021 Series.

The new 5031 Series is available in diameters from 3 to 16 mm. The rigid and robust 5031 has an overall length from 40 mm to 72 mm with a length of cut from 7 to 24 mm. This reduced shank and flute length eliminates vibration and vastly improves machining performance on high material removal applications. These benefits are underpinned by the harmonic flute geometry that improves chip evacuation and extends tool life. ITC has also introduced the 5031 Series with an extensive range of corner radii of each diameter.

The smallest 3, 4 and 5 mm diameter tools now include a 0.25 and 0.5 mm corner radius, while the 6 mm tool adds a 0.75 and 1 mm radius. For the 8, 10, 12, and 16 mm tools, the diameter increments above 1 mm increase in 0.5 mm increments all the way up to a 4 mm radius on the 16 mm tool.

This optimised geometry combines with the sub-micron carbide substrate and the extremely wear resistant Cupro coating to deliver reduced torque and load on the machine tool. This is credit to a smooth cutting action that improves swarf evacuation and reduces the temperature during machining. The composition of the 5031 Series makes it the tool of choice for machining steel and exotic materials that inherently increase the temperature and stress on the cutting tool.

The issue of high-temperatures and machining load are a thing of the past with the 5031 Series, as its harmonic flute geometry and centre cutting action guarantee a consistent chip thickness as well as a constant delivery of torque through the spindle.

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Polygonal clamping delivers results in turning applications

For years, customers have been using TRIBOS polygonal clamping technology to achieve excellent results in applications such as micro cutting and to lower tool costs. With TRIBOS ER, SCHUNK is now bringing the patented technology of polygonal tool clamping to sliding and fixed headstock lathes and rotary transfer machines. Pilot users, such as Zisterer Präzisionsdrehteile GmbH in Villingen-Schwenningen, Germany, are impressed. The company has reduced machining time in demanding milling applications by one third while significantly improving surface quality.

There are good reasons why SCHUNK is now unlocking the potential of polygonal clamping technology for lathe chuck technology. For one, the requirements for sliding headstock lathes are constantly growing. At the same time, customers are facing considerable pressure to lower prices, particularly for high-volume parts. For Zisterer Präzisionsteile GmbH SCHUNK's decision to standardise the TRIBOS ER came just in time. The manufacturer of complex hydraulic components was regularly experiencing process disruptions due to tool breakages as tools with a long overhang and cutting diameters of 2 mm could not withstand the vibrations that occur. Halving the speed was the only way to ensure the process stability required for high-volume production. Instead of 12,000 to 15,000 rpm, the company had to accept speeds of 6,000 rpm and the resulting reduction in cycle time.

Machining time reduced by a third

"Until now, our maximum speed was 6,000 rpm," explains Uwe Walikewitz, head of CNC longitudinal turning at Zisterer. Everything beyond that would inevitably lead to tool breakage, unless the company had switched to expensive special tools with reinforced shanks. "The TRIBOS system saved us around 200 seconds at a total machining time of just below 600 seconds," says the machining specialist. "The rotational speed was only reduced by 500 to 1,000 rpm as compared to the recommended cutting parameters, and lo and behold, it worked perfectly."

The fact that SCHUNK primarily designed



The precision toolholders can clamp all tool shanks with h6 tolerances and diameters of at least 1.0 mm

the TRIBOS-Mini used in these milling operations for drilling, rather than milling, has hardly any effect on small cutting diameters. On the contrary, "The slim interfering contour of the toolholder mounting allows excellent accessibility without excessive tool overhang. It stabilises and dampens the vibrations on the tool," says Uwe Walikewitz. "We tested the mounting and immediately installed it on three automatic lathes." The investment quickly paid off, not only because it has reduced cycle time, it has also improved process reliability in automatic mode,



lowered tool costs and improved the quality of surfaces. "With TRIBOS, the surface is much finer than with collet chucks," he adds.

Quick setup and precise adjustment

Tools can be preset in the TRIBOS mounting at an accuracy of 0.01 mm in length and exchanged in the collet chuck in just a few steps. In this way, the user benefits from fast setup times and much higher repeat accuracy in the clamping system in terms of run-out accuracy and projecting lengths compared to ER collet chucks. A complete tool change only takes 20 seconds.

Slim or powerful

TRIBOS polygonal toolholders with ER tapers come in two different versions: The slim TRIBOS-Mini ER is ideal for micro cutting and sets the benchmark when it comes to small shank diameters. It is available in sizes ER 11 (clamping diameter 1 to 4 mm), and ER 16, ER 20, ER 25, and ER 32 (clamping diameter 1 mm to 6 mm). TRIBOS-RM ER, on the other hand, is perfectly suitable for precise high-volume machining at high rotational speeds.

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A juicy addition to Leader's workholding range

The Orange Vise range of high quality precision vices from America is now available in the UK exclusively from workholding specialist, Leader Chuck Systems.

Thoroughly engineered to deliver maximum clamping force and repeatability with quick-change features throughout, the vices are designed and manufactured in the USA to achieve the ideal balance of performance and longevity. Every vice is covered by a lifetime warranty against defects in materials and craftsmanship.

The range includes 4 and 6 inch dual station and 6 by 16 inch single station vices.

The 4 inch dual station vices offer a compact footprint while the larger vice is available in 17.5 and 20 inch lengths. Every dual station model features independent jaw stations, so dissimilar sized workpieces can be clamped with equal force.

Managing director, Mark Jones says: "These precision machining vices are produced to exceptionally high levels, which is why they carry a lifetime warranty on materials and workmanship. This quality comes as standard and the range is very competitively priced, so there is no cost penalty for any workshop selecting the best solution."

Machined from a solid billet of Dura-Bar iron rather than cast to shape, there are no rough sand cast surfaces, every surface of the vice is either machined or ground and then selectively powder coated. The screw is sealed so that no threads are ever exposed to chip or swarf ingress.

Dual station vices can also be quickly converted into single station vices without any additional hardware. This flexibility is also applied to the 6 by 16 inch single station vice as double station conversion kits are available. Similar in design to the dual station vices but without a centre jaw, the fixed jaw is held down securely with an angled wedge from underneath, rather than cap screws from above. This allows unobstructed machining of optional soft jaws.

Available in steel or aluminium the optional low-cost soft jaws feature a greater machinable volume than most other jaws on the market. For additional capacity XL



stepped jaws can increase the jaw opening from 12 inch to as much as 18.5 inches on the 6 inch dual station vice. Made of cast iron and compatible with all 6 inch vices, the XL Stepped jaws are said to be far more rigid and repeatable than outboard jaw plates used on typical vice setups.

Long and thin workpieces require additional support to prevent tool chatter and workpiece flex. Orange Vise produces extra wide machinable jaws that provide the solution. Available for all 6 inch vices they are offered in standard widths of 8, 10 and 12 inch.

Cost-effective, machinable vice pallets can be directly clamped to the vice body, using dowel pins and carriers for locating and hold down. No bolts are required, which frees up the entire surface of the plate for holding parts and clamps. Pallets are available in a variety of standard and custom sizes.

To secure irregularly shaped workpieces the sliding jaws can be machined down to just 13 mm from the vice bed, enabling users to remove a significant amount of the material to hold challenging workpieces. This large amount of machinable volume adds a level of flexibility that is typically only seen in dedicated fixturing setups at just a fraction of the cost.

Quick-change jaw plates with 3-axis locating ability are included with every vice,

with bolt-hole patterns to industry standard to ensure compatibility with existing jaw plates. Cast iron, steel, and aluminium sub-plates are available in a variety of sizes and can be customised to fit any machine table.

Leader Chuck Systems now ranks among the world's top suppliers of chucks, workholding, workpiece and tool clamping and raw material/component feeding products, offered alongside expert advice and a commitment to customer service that is second to none. A wide variety of component clamping, toolholding and automation solutions makes Leader Chuck Systems a leader in the market.

In addition to a comprehensive off-the-shelf range of power chucks for CNC turning machines, self-contained chucks, compact static chucks, pallet chucks and vices, Leader's considerable expertise is also renowned for offering practical answers to workholding problems. Leader Chuck offers quality, precision and reliability at competitive prices with reliable expert advice and a commitment to customer service.

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Die clamping without a permanent hydraulic supply

A new, self-locking wedge clamp for safely securing dies on power presses and injection moulding machines, without the need for a permanent hydraulic supply, has been introduced by Roemheld UK. Designed for clamping dies with straight edges, the element applies spring force for retention and a pressure of up to 160 bar is sufficient for release, which can be provided by the machine hydraulics.



An example of a new Roemheld wedge clamp that does not require a permanent hydraulic supply for clamping dies on presses and injection moulding machines. Inductive and optical position control contribute towards enhanced operational safety

Inclined at six degrees, the clamping bolt approaches the die edge from the side, resulting in a self-locking connection, following which a spring applies frictional force that can be maintained over long periods of time. Inductive and optical position control deliver enhanced operational safety.

The robust, compact wedge clamp is coated to inhibit rusting and can withstand harsh environments including dirt and temperatures up to 160°C for high functional safety, even in the most challenging production processes. Tolerance for clamping edge height is ± 0.5 mm, spacer plates compensating for any deviation. Cylinder diameters are

between 35 and 85 mm and operating force is from 25 to 120 kN, depending on unit size.

In the standard range, the availability of four hydraulic connection variants provides flexibility for different assembly configurations. Modified wedge clamps can be supplied to suit customers' specific applications. Additional versions are available for clamping on angled die edges, with permanent lubrication or multi-layer coating to improve wear properties. All clamping elements comply with the Euromap Directives.



Typical wedge clamp positioning on a power press

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'.

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New power milling chucks offer flexibility and superior clamping power

Seco Tools introduces its new Power Milling Chucks, with levels of holding power and transmittable torque rivalling those of hydraulic and shrink-fit holder types for maximised milling performance.

Power Milling Chucks deliver enhanced application flexibility and cost effectiveness while allowing machine shops to reduce tooling inventories.

The Power Milling Chuck delivers 5-micron runout accuracy at 3XD. Through direct clamping technology, one Seco chuck can hold cylindrical plain 20 mm, 32 mm, 0.75" and 1.25" and Weldon shank tools of 20 mm and 0.75".

With the use of reduction sleeves, a single chuck can also handle shank diameters in cylindrical plain, Weldon and Whistle Notch tools from 6 mm up to 25 mm, 0.25" up to 1.00".

The chucks accommodate milling tools for roughing and finishing operations as well as drilling and tapping tools.

Seco Tools Power Milling Chucks offer

shops innovative advantages over standard collet chucks. A nut and needle-bearing design produces superior clamping power with minimum tightening force/torque requirements, compared with the steel-to-steel contact on collet chucks.

Optional coolant-stop screws enable Power Milling Chucks to engage through-tool coolant. These Seco chucks require no additional expense for ancillary equipment such as heating or hydraulic units.

Seco Power Milling Chucks are available for HSK-A, Seco-Capto™, DIN, BT and BT taper-face, and ANSI and ANSI taper-face spindle interfaces.

Each chuck includes a sleeve extractor, stop screw (with DIN, BT and ANSI interfaces) and operating instructions.

Seco Tools (UK) Ltd
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Seco Tools' new Power Milling Chucks provide superior clamping power



Vision Engineering unveils 3D digital display technology

Visual inspection pioneer launches DRV at Control, Stuttgart

Vision Engineering Ltd has unveiled a revolutionary, globally patented, digital 3D stereoscopic display technology. Vision Engineering's DRV (Deep Reality Viewer) creates stereo high definition 3D images without using a monitor, or requiring operators to wear headsets or specialist glasses, images float in front of a mirror. DRV offers users the well-known Vision Engineering advantages of ergonomics and optimised user interfaces, while ensuring full interaction with other local or remote users and other tools/PC's or complementary analytical equipment.

Vision Engineering anticipates that this unique, first-to-market device will be particularly valuable to organisations that model and test components in 3D, as well as facilitating improvements in manufacturing processes such as PCB inspection and reworking. DRV has the particular advantage for multi-site companies of offering real time, full HD 3D stereo images to multiple users in different locations at the same time.

Manufacturing companies have tried to exploit the potential offered to them by consumer driven technological trends in virtual reality, augmented reality and 3D polarised/shutter glass viewing. Along with the advantages of these breakthrough technologies, they have experienced substantial drawbacks in sensory isolation, disorientation and resolution.

Modern manufacturing techniques involve multi-site communicability in real time. The latest trends of AI, the IoT and the



cascade effect of Blockchain require information to be accessible to multiple users, at the same time, with the same fidelity.

Developed to address quality control and production requirements in sectors including electronics, aerospace, automotive and medical industries, DRV offers full, real time transferability of information to multi-site manufacturers, designers or users of multi-tier development and logistic capabilities.

DRV carries on the company's 60-year long tradition of creating ergonomic, high-quality visual inspection and metrology systems that reduce operator fatigue and improve accuracy, consistency and productivity, but, critically, exploits modern digital capability to communicate across substantial distances.

Using Vision Engineering's globally patented TriTeQ3 digital 3D display technology, the DRV Z1 (Zoom model 1) incorporates a zoom microscope module and is the first device of its class to be launched by the manufacturer.

DRV Z1 is designed to advance the quality control and production process, by enabling operators to view magnified subjects in 3D, in unprecedented detail, without the need for additional viewing apparatus.

Its unique, deep reality viewer enables stereoscopic 3D viewing with vivid depth perception, at UHD resolution, without requiring special eyewear or VR headsets. DRV has been developed to address QC and QA requirements in electronics,

automotive engineering, aerospace industries and all precision engineering applications and is the first of its class. It represents an amalgamation of Vision Engineering's award-winning optical stereoscopic and digital technologies, with its ergonomic design reducing operator fatigue while promoting productivity and accuracy.

Commenting on the technological breakthrough, Paul Newbatt, Vision Engineering's sales and marketing director says: "TriTeQ3 blends Vision Engineering's long-established, industry-proven and award-winning optical stereoscopic technologies and digital technologies. DRV Z1 delivers a technological breakthrough and is a game changer for inspection and quality control processes."

Mark Curtis, managing director of Vision Engineering, says: "Over the past 60 years, Vision Engineering has built its reputation on the innovation, quality, performance and ergonomics of our visual inspection and metrology systems. DRV Z1 provides enhanced 3D visualisation and overcomes current problems with 3D modelling and inspection systems. By amalgamating our existing technologies, we've delivered an entirely new concept to our existing customer base, as well as opening up opportunities in fresh markets."

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Robust, accurate and non-contact measurement of vertical surfaces

How to measure flanks with more than 90°

So far, geometries such as the bore holes of injection valves in the automotive industry could hardly be measured optically. Lateral probing of components with vertical surfaces was limited to tactile measuring systems, CT solutions or complex special solutions. This has now changed with a new function of the optical Coordinate Measuring System (CMM) μ CMM, which Bruker Alicona is presenting at this year's Control show in Germany, Stuttgart. Vertical surfaces of more than 90° can now also be measured optically.

μ CMM enables optical hole measurement

μ CMM is the first purely optical CMM that enables the measurement of dimension, position, shape and roughness of smallest tolerances contact-free and with only one sensor. Now, a new feature of this measuring system also allows the lateral probing of components. Component features such as holes, bores, reference surfaces, contours and lengths can thus be optically measured with high accuracy, high resolution and in short measurement times. The diameter-depth ratio of holes ranges from 1:3 to 1:10 and the measurable diameter is 0.1 mm to 2 mm. Users can

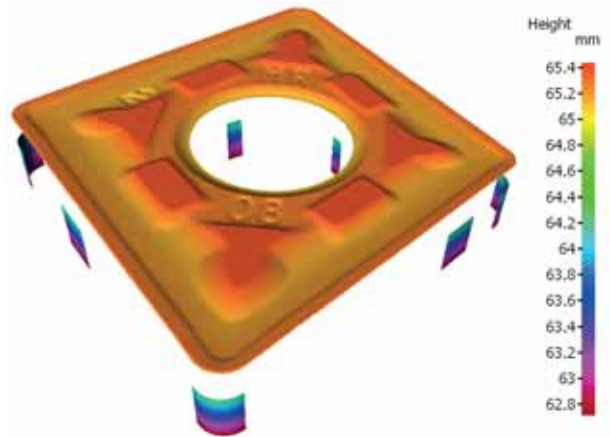
measure parameters such as outside and inside diameter and opening angle. In combination with an automatic rotation unit " μ CMM Real3D", turning the 3-axis CMM into a 5-axis system, multiple holes, including their orientation to each other, can be measured. One application which can be achieved using the μ CMM, in combination with Real3D, is the measurement of injection nozzles including diameter, K-factor, injection angle and side angle.

New Vertical Focus Probing technology

The patent pending method for hole measurement "Vertical Focus Probing" is an extension of the Focus-Variation technology and is based on the use of a partial light cone. Individual light rays diffusely reflected from vertical surfaces are captured by the lens. Flanks with more than 90° are traceably measured in high-resolution and high repeatability. Vertical flanks measured in this way can be used, for example, to fit a workpiece coordinate system.

μ CMM allows highly accurate measurement of smallest tolerances, even on large components. 3D data is captured areal based and in high measurement point density, which, in addition to measuring dimensional parameters, also enables the measurement of roughness according to EN ISO 4287/88, Ra, Rq, Rz and 25178, Sa, Sq, Sz. Due to the high accuracy of the axes, individual measurements are precisely related to each other. Users can also verify the position of their components in this way. Therefore, it is no longer necessary to measure the entire component optically as it is sufficient to measure only those areas that are relevant. For a user, this means a significant reduction in overall measuring time.

Alicona is a global supplier of optical 3D surface measurement solutions for quality assurance in the lab and in production. Its key competence is the measurement of form



and roughness of even complex, miniaturised geometries. With Focus-Variation, its key technology, the company offers a technique that combines the functionalities of a micro CMM with those of a surface measurement system. For a user, this means to measure both form and roughness of components on an areal basis. The stable and robust technology of Focus-Variation delivers repeatable and traceable measurements even in a production near environment.

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

The company is headquartered in Austria with additional subsidiaries in Germany, France, UK, USA, South Korea, Italy and further expansion is continuing. A global network of selected distributors ensure that Alicona products are available worldwide.

Alicona measurement systems are based on the technology of Focus-Variation and combine the functionalities of a surface roughness measurement device and a form measurement system.

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FARO provides the solution for AluCast

Based in the heart of the Black Country in Wednesbury, West Midlands, AluCast Ltd is an award-winning aluminium foundry that is an acknowledged leader in the supply of high integrity structural parts. The company offers an all-embracing concept to production service, including full technical support throughout the manufacturing cycle.

The ISO 9001:2015 and ISO/TS 16949:2016 accredited company has the ability to manufacture castings of up to 50 kgs in weight and has a weekly capacity of approximately 25 tonnes using both manual and automated production methods.

AluCast's high-pressure die casting facility is able to manufacture castings of up to 3+ kgs and can deliver high production rates of up to 200 castings per hour. Gravity die production methods are widely used for the manufacture of medium to high volume production. This process uses a permanent mould, resulting in a near net shape product. AluCast's Sand casting production method can be employed for the manufacture of prototypes as well as for regular production items.

In addition to providing first-class foundry facilities, AluCast is able to manufacture fully machined parts to customers' specifications in its well-equipped machining facility.

The drive for improved fuel efficiency has prompted the global automotive industry to develop ever lighter components. As a result, over the past decade AluCast's advanced aluminium casting and machining provision has enjoyed impressive levels of growth and the company is now a major supplier to the demanding automotive sector.



To ensure that the company's 100 plus skilled workforce are able to keep pace with increasing demands, significant investments have recently been made in innovative casting plant and high-quality machine tools.

To help the company's important inspection provision keep-pace with its increased production volumes, AluCast quality and technical director, Martin Haynes recently began a search for an accurate, yet speedy metrology solution.

After been tasked with casting a range of urgently required prototype parts for an important customer, AluCast completed all of the relevant casting processes in record time. Having been told that its parts were now ready, except for the required dimensional inspection process and that this process would take another day, the customer suggested that, to speed-up the parts' delivery, it would visit AluCast's facility and perform on-site inspection with its own FARO ScanArm.

Impressed by the speed the FARO equipment was set-up, so soon after the customer's arrival and the FARO ScanArm's ability to quickly scan each of the components and gather all of the required accurate data, Martin Haynes was convinced that a FARO ScanArm was the ideal answer to AluCast's challenging dimensional inspection needs.

He explains: "Although, prior to witnessing our customer's FARO ScanArm in action, we were considering several inspection options from major metrology companies, the outstanding performance of the FARO equipment persuaded us that this

was the way to go. As well as being impressed by the dimensional accuracy achieved and the clear presentation of the captured data, we were astonished at the equipment's phenomenal speed of operation. In fact, we estimated that the inspection results our customer achieved in just one hour, would have taken us over eight hours with the use of our existing equipment.

"Soon after our customer's visit, to help confirm our opinion we organised a practical demonstration of a FARO Edge ScanArm® HD on a wide cross section of both our cast and machined components. As previously witnessed, FARO UK's sales engineer was able to quickly set the instrument up and to complete rapid, precise scanning routines on each of the parts we presented. Confident of the Edge ScanArm HD's capability, an order was soon placed with FARO UK."

Martin Haynes concludes: "Our FARO Edge ScanArm HD has delivered on all of the promises made by the staff of FARO UK in terms of simplicity, accuracy and speed-of-use. As well as the inspection processes, we purchased the FARO ScanArm for, each day we are finding new uses for it. So important to our inspection provision has it become, we now wonder how we managed without our new FARO Edge ScanArm HD."

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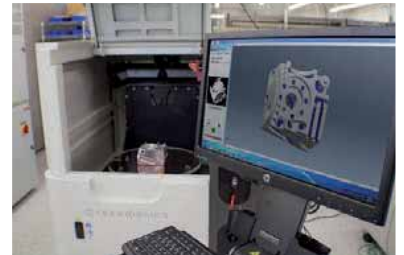


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Gauge Setting System from Bowers Group

Atlas Copco is now measuring internal threads on its hydraulic bolt tightening tools with a Gagemaker Mic Trac Gauge Setting System from Bowers Group. Founded in 1873, Atlas Copco is a world leading engineering group manufacturing industrial tools and equipment. The company's Wolverhampton based manufacturing facility is a brand new, state-of-the-art global bolting innovation centre and the headquarters of Tentec Ltd, which is one of the leading providers of bolt tightening solutions globally.

As part of the Atlas Copco group, Tentec Ltd designs, manufactures and distributes a wide range of hydraulic bolt tightening tools used both on land and in subsea applications, which are widely regarded as world class for their reliability and accuracy.

Atlas Copco identified the need to further develop the way it checked internal threads on components. Instead of using 'Go/no-go' gauges, the company required a measurement method that was more specific for certain applications and would meet its goal of continuous improvement.

Bowers group provided Atlas Copco with the Gagemaker system to measure the internal threads on a variety of components, including hydraulic bolt tightening tools. The Gagemaker allows Atlas Copco to provide more detailed feedback on tolerance to customers.

Many of the components manufactured by Atlas Copco are nickel plated in order to provide corrosion resistance for parts that will be typically be used in subsea and exposed to salt water. As saltwater can be extremely corrosive, the components need to be exceptionally accurate considering the critical applications that they are part of. If a part doesn't meet tolerance and is the wrong size, they will not meet stringent design criteria and will not be passed off by the inspection team.

Members of the quality team at Atlas Copco previously used 'Go/no-go' gauges as measurement inspection tools, which allow workpieces to be checked against allowed tolerances. As the name suggests, the check involves the workpiece having to pass one test, go and fail the other, no-go. Although 'Go/no-go' gauges are an integral part of the quality process used in manufacturing components at the company and are perfectly adequate, a more



sophisticated method of measurement was required in order to further develop the measurement process on critical applications.

Now, if one of its old gauges is out of calibration, the team no longer need to replace it, as the Gagemaker fulfils this need. The Gagemaker system has, therefore, saved Atlas Copco a significant amount of money.

Accuracy has also increased due to the ability to measure components at various stages during the manufacturing process. The old gauges only allowed operatives to measure components at the very end of the process, meaning that if a mistake had been made it would often be too late to correct, and could result in scrappage and waste.

The Gagemaker system, however, allows operatives to monitor the dimensions of the parts at intervals throughout the manufacturing process, enabling them to adjust the machining mid-way through manufacture to achieve required accuracy.

The connectivity that the Gagemaker system offers is also a huge benefit to Atlas Copco. The business was extremely keen to streamline its manufacturing process and the Gagemaker offers a SPI output cable to transfer data to spreadsheets at the touch of a button. Digital readouts allow the company to produce reports in order to provide customers with definitive evidence that manufactured components meet ISO standards and British standards.

The Gagemaker Mic Trac Gauge Setting System, used by Atlas Copco, has a range of 0" to 24" internal and 1 1/2" to 25 1/2" external. This multi-use gauge setting



system sets or zeros most gauges with the use of interchangeable anvils or blocks and incorporates the ForceLok™ feature to provide a constant anvil force that improves repeatability from operator to operator.

This electronic, adjustable calibration and measurement centre will inspect parts, preset indicator system gauges and calibrate a variety of hand-held inspection gauges. Suitable for use on the shop floor or in the calibration lab, the Mic Trac system contains receiver pads, which are precision ground in matching sets and used as parallel surfaces for measuring or holding fixtures.

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IndySoft announces biggest software update in company history

IndySoft, a leader in calibration and asset management software, has just announced a new release of its software, IndySoft Version 12. IndySoft's latest release takes the best-in-class software and makes it even better with over 200 new features and enhancements. It represents the largest update in the company's 20-year history.

Chief technology officer, Rhett Price says: "We are very excited about the updates in Version 12 because they all came about as direct requests from our customer base. Over the past year, we have been very focused on being partners with our customers rather than just being a faceless vendor. We conducted surveys and hosted a customer advisory board. We received tons of feedback on the product and direction that our customers wanted us to go. This release is all about the implementation of features that will solve the problems that our customers brought to us."

One such problem was syncing data back to the lab when a calibration technician did off-site field work and internet access was not available. IndySoft came up with a solution whereby a starter database is created, once a week, that includes off-site workflows, security settings, masters and historical data, equipment templates and charges and calibration procedures. Prior to heading out to complete field work, the technician selects the companies that it will be visiting and the starter database, equipment, history and work orders are all downloaded onto the technician's device.

During the week, the technician would perform its calibrations as normal, enter the data into IndySoft then, once the computer detects that they are connected to the internet again, the results are pushed back to the lab and lab updates such as calibration procedure or master modifications automatically are sent to the field technician. This is all done without user interaction, so there is no additional technician training required and the lab is able to invoice the same day.

Rhett Price says: "We also received a lot of feedback on how we manage test points, so we overhauled our test point system. The upgraded advanced test point grid is a new superior way to setup calibration test



results. The system was modified to be more powerful than ever and easier to use, especially for customers familiar with Excel."

The test point system was additionally enhanced to allow multi test points within one piece of equipment or template. This is valuable when different sets of tolerances are needed for one piece of equipment. For example, if you have one set of tolerances for standard calibrations and a different set for accredited calibrations, or if you have a customer that has very specific tolerances.

Also, as a result of customer feedback, IndySoft added a wealth of new fields throughout the software. From test points, to events, to customer information, there are over 60 new fields that allow for complete customisation. The user is able to determine which fields are hidden or visible, so the user experience is tailored to every individual customer's requirements.

Furthermore, Version 12 introduces IndySoft Spreadsheet, an Excel clone, into the software. It allows users to work natively with the popular spreadsheet document file environment without using any external spreadsheet software, saving companies the additional expense of having to purchase Excel for all of their workstations. It works

with .xlsx, .xls, .csv and .txt files, so most calibration results already written in Excel can be performed with IndySoft Spreadsheet.

Rhett Price adds: "ISO/IEC 17025 compliance is critical to IndySoft customers, so we received a good deal of feedback from our customers requesting making revision status and change tracking easier to manage. As a result, we added automated revision control to our certificates and a version control system that tracks changes, documents and allows roll-back to prior versions for all customisable areas of the software."

IndySoft has long been a leader in the calibration management software sector. With the introduction of Version 12, the company has enhanced its offering to commercial calibration companies and enterprise customers.

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Developments with high customer value

As an evaluation software for 3D measuring data, GOM software is a central component of 3D measuring systems that is highly valued by customers. With annual development cycles of the software, it offers improvements and new features specifically developed to meet customers' needs. In GOM Software 2019, the company is focusing on new functionalities aimed at optimising workflows, which are summarised under the term "Smart Teach". The software was significantly enhanced for the GOM CT and the company is once again proving its innovation leadership in the field of virtual clamping. Instead of using complex clamping devices, it will also be possible to measure with algorithms in the future.

Smart Teach

With the new Smart Teach functionalities of the GOM software, the system takes over tasks that previously had to be performed by the user in the work process. If the CAD or single elements change, the measurement positions are automatically updated with Smart Teach. In addition, the user is much more supported in achieving a stable measuring sequence in a shorter time by advanced display options of the project status. This is also further emphasised by the introduction of application templates for application-specific parameter assignment prior to the measuring procedure. For shiny or complex surfaces, that require a specific measuring angle due to their nature, these preferences offer significant efficiency gains in the work process.

GOM CT Professional

The new GOM CT Professional software enables both the operation of the GOM CT and the inspection of complex parts. Volume-based data can thus be measured and inspected in a simple workflow without the need for third-party software. All surfaces, even internal structures, can, for example, be used for shape and dimension analyses or nominal-actual comparisons. The

inspection results can be visualised in reports with snapshots, images, tables, diagrams, text and graphics.

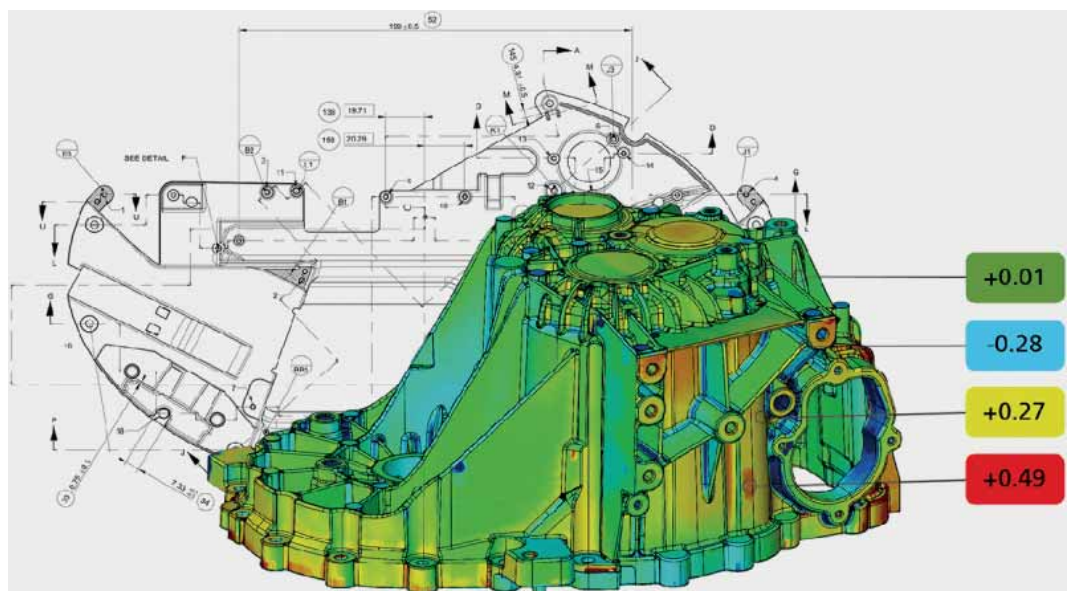
Virtual clamping

At the Control exhibition, GOM presented a preview of the enhancements regarding virtual clamping developed for ATOS and GOM Inspect Professional software packages. In many cases, sheet metal and injection-moulded parts must be brought into a constrained position for dimensional

transfer of inspection features in GOM Software 2019.

The beta version of the GOM Software 2019 will be available from May 2019 while the freely available GOM Software 2018 can be downloaded free of charge at www.gom.com. On the GOM website, there is a user forum, training material and video tutorials.

GOM develops, produces and distributes software, machines and systems for industrial and automated 3D coordinate



evaluation. Virtual clamping replaces complex clamping devices with an innovative FEM-based algorithm. The virtual clamping process is fully integrated into the GOM workflow. There is no need to exit the proven software interface.

GOM meets high standards of Industry 4.0

In the course of industry 4.0, it is becoming increasingly important to transfer data such as product manufacturing information (PMI) from design and measurement applications quickly and easily. Defining a 3D Master within the CAD model is one of the tools offering substantial benefits in metrology. The 3D Master allows creating the entire inspection plan within the CAD in advance. This way, the inspection plan can be generated directly during the CAD import into the GOM software. Complex additional programming in the measuring software is not necessary. GOM has further optimised corresponding interfaces for the digital

measuring technology and 3D testing based on latest research results and innovative technologies.

With more than 60 sites worldwide and an employee network of more than 1,000 metrology specialists, GOM guarantees professional advice as well as support and service to operators on-site and in their local languages. In addition, the company shares its knowledge on processes and measurement technology in training courses, conferences and application-based workshops.

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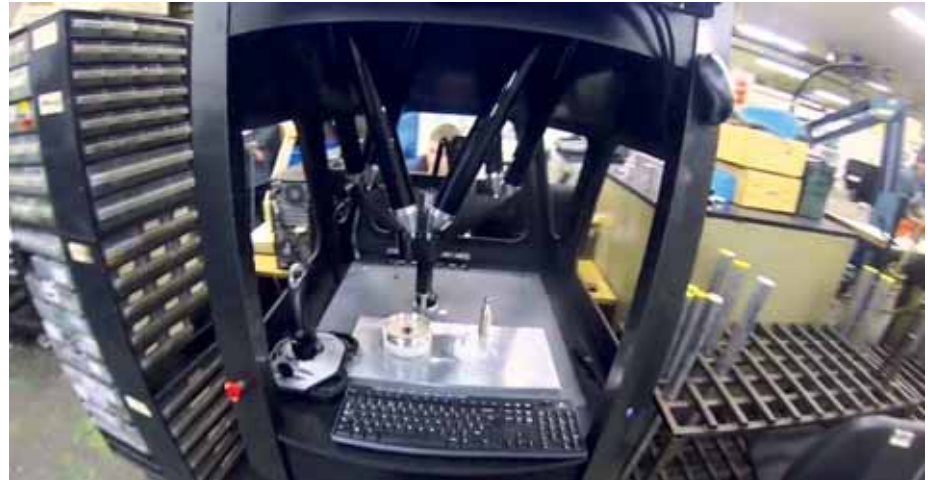
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Aberlink provide gold medal quality for Leeds Bronze

Businesses are reaping the benefits of inspecting manufactured components closer to the point of production, with the trend towards shop-floor based inspection continuing to accelerate. Whereas in the past, Coordinate Measuring Machines (CMM's) would be used only in dedicated inspection departments, increasingly a new generation of robust CNC CMMs can now be found located on companies' shop floors.

Leeds Bronze serves a long list of customers working in challenging sectors including the global oil and gas, marine, defence and power generation industries and therefore the quality of its output is of paramount importance. As a recent significant increase in production volumes had the potential to place a strain on Leeds Bronze's inspection provision, a decision was made to invest in an advanced CNC CMM that would provide an accurate and efficient means of inspection on the company's shop-floor. After considering several alternative machines, an advanced Xtreme CNC CMM was purchased from UK manufacturer Aberlink.

Chief inspector, Tony Friend explains: "As a company, we set and regularly review our quality objectives to meet our evolving business goals. For example, to ensure that our inspection tasks were able to keep-pace with increased production levels, we recently looked at a couple of alternative shop-floor CMMs. On reflection, we believed that Aberlink's Xtreme CNC CMM was the most suitable for our needs. In addition to its robust construction and ease-of-use, the Xtreme delivers impressive levels of accuracy and operational speed.



"Now installed centrally on our shop-floor, our quality personnel has written and stored a range of inspection programs on the Xtreme's computer. Now, when measuring first-offs or performing other inspection tasks, our machine operators simply place the part under inspection on the Xtreme's component support, quickly recall the relevant program and then start an automatic CNC inspection routine. In addition to providing our shop-floor personnel with instant feedback and reducing our already low scrap-levels, the use of our new extremely fast and accurate Xtreme CMM has taken much of the strain off our busy inspection department's CMMs."

Launched in a blaze of publicity at the MACH 2016 exhibition, the Aberlink Xtreme CNC CMM was designed to provide accuracy, ease-of-use and speed of measurement within production environments. The global success of the Xtreme recently prompted Aberlink to launch a larger capacity Xtreme CMM. Aberlink's Gloucestershire based manufacturing facility is now working flat-out to keep pace with both UK and overseas demand for this unique range of robust CMMs.

The Xtreme has a novel, non-Cartesian structure and makes use of linear motors and mechanical bearings. This advantageous arrangement guarantees that the CMM maintains its impressive accuracy performance at very fast measuring speeds and ensures that it does not suffer from the accumulative inaccuracies that occur in conventional 3-axis Cartesian arrangements.

Aberlink's cost-effective Xtreme CMM requires no compressed air and boasts the shortest learning curve of any equivalent system, an inexperienced operator is normally able to become competent in the Xtreme's use in just a single day, making the easy to use CMM the ideal 'plug and go' shop-floor measuring solution. In addition, the Xtreme's integral temperature control function ensures that accuracy levels are maintained, even when the surrounding ambient temperature is not controlled.

Ensuring greater user productivity and profitability, the Xtreme utilises Aberlink's renowned 3D software. A welcome bi-product of any Aberlink 3D inspection routine is that a simultaneous picture of the measured component is created on the CMMs computer screen. Dimensions between the measured features, mirroring those that appear on the component drawing, can be simply picked off as required. This 'smart' software represents an intelligent measuring system that is able to automatically recognise and define the various features being measured. Aberlink 3D is claimed to be the easiest to use and most intuitive CMM software currently available, making it ideal for use by both quality and production personnel.

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ZONE3 multi-sensor metrology software

ZONE3 is the culmination of OGP's experience at the forefront of the multi-sensor metrology world for the past 30 years and more. This next-generation software package represents a totally new way of working with multi-sensor technology, where built-in 3D CAD-based animations clearly display relationships between parts, sensors, datum alignments and machine tooling.

When machine operatives can seamlessly interact with measurement systems, the power over the production line is placed directly in their hands.

ZONE3 is a critical part of the Industry 4.0 jigsaw, delivering major quality control benefits for businesses of all sizes and across all sectors, from medical and automotive to aerospace and consumer goods.

It accepts CAD models in native format, using the CAD model and other innovative characteristics to speed up automatic routine building. It is possible to load multiple CAD models if the task requires it, such as a fixture model and part model.

The software's 'Apply to Similar' feature, which copies the steps for similar features in the CAD model to all instances, makes

programming fast and easy, working alongside other tools to maximise manufacturing throughput. Synchronous, full-field image processing and high-speed cameras allow entire scenes to be measured instantly.

ZONE3 is truly sensor independent, operating systems with video, laser, touch and scanning probes. It is designed to work with any combination of these sensors in any order, letting you choose the best measurement tool for every feature of a part, even when those features are not easily accessible.

Operating alongside other OGP metrology applications, including MeasureMind and Measure-X, ZONE3 allows users to retain a library of existing part routines while adding new 3D measurement capability to a SmartScope multi-sensor metrology system.

It includes the full range of geometric measurement capabilities alongside advanced features such as automatic path generation, animation-assisted alignment tools, real-time virtual machine kinematics, a graphical sensor builder and universal construction tool.



It can be configured for specific user needs, offering custom user forms and variables, report formatting, dynamic reporting with measurement result inaccuracies displayed on the 3D part model and part family programming.

As ZONE3 works directly from 3D CAD files, common formats such as STEP, IGES, VDA and DXF are easily importable, with no need for file preparation or transformation.

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Single source policy aids efficiency

Rather than acquiring manufacturing plant on a piecemeal basis, the practice of companies purchasing and using machine tools of various categories from single, preferred vendors is now firmly established. For example, milling machines of a particular brand would be used by a company, while grinding machines and EDM machines from two other manufacturers would be employed.

This brand loyalty can be motivated by a range of factors including the price and the technical ability of the chosen brand, to the reputation of the machine tool manufacturer concerned and the levels of service they provide.

The advantages of pursuing such a single brand, per machine tool category policy, includes the flexibility provided by the users' machine operators in being able to swap between machine tools featuring identical operating systems. Also, following the installation of a newly installed machine, operator training times are much reduced.

As with their machine tools, more and more forward-thinking businesses are now adopting a single measurement system vendor philosophy. Today, many inspection duties are carried out by production personnel on the shop-floor, rather than being undertaken by dedicated staff in QC departments located away from the point of manufacture. As measuring equipment is now commonly used by both quality and production personnel, given the huge difference between various metrology company's operating systems and software, it makes sense that businesses are increasingly single sourcing their measuring equipment. One such progressive company that had adopted a single source measurement system policy is Glenrothes, Fife-based A & D Precision Engineering.

A & D Precision's engineering quality manager, Harry Fernando explains: "In addition to reaping the benefits of favouring the products of certain manufacturers in each of the machine tools categories we use, we have extended this way of working across all of our quality and inspection endeavours. As we consider that a component is not made until it is inspected, it makes sense to us that we treat quality and inspection as integral parts of our production processes and that we expect the same levels of efficiency from our inspection functions as we do from our manufacturing activities.

Although, in the company's early days we used metrology equipment from several sources, the reliability, accuracy and repeatability of our early Mitutoyo products and the excellent service we received from the company, meant that as the company grew, and our older metrology equipment needed to be replaced, we invariably invested exclusively in further Mitutoyo products. This has resulted in our measuring equipment inventory now consisting of 99 percent Mitutoyo products.

"We now use examples of Mitutoyo technology in all of our measurement and testing areas, from our digital hand tools, through height gauges, vision equipment and surface roughness testing, to our quality department and shop floor-based Coordinate Measuring Machines (CMM's).

"As we serve a wide range of challenging industrial sectors, the quality of our output is important to all at A & D Precision



Engineering. Our 'belt and braces' approach to quality means that in addition to in-depth final inspection routines being performed by our quality personnel, our skilled machine operators also undertake regular in-process quality checks. The robust nature and quality of our Mitutoyo equipment means that it consistently delivers the demanding levels of precision that we require in both our quality department and on our shop floor."

Just as A & D Precision Engineering use premium quality machine tools that deliver maximum levels of accuracy and productivity, the company's management expect the same levels of precision and efficiency from its inspection equipment. These critical requirements are reflected in the company's latest Mitutoyo acquisition, the recently installed, advanced Crysta-Apex S CNC CMM.

The Crysta-Apex S Series of high performance, cost-effective CMMs are designed and constructed according to Mitutoyo's extensive experience in CNC CMM technology. Manufactured from advanced lightweight materials and boasting an innovative machine structure, the Crysta-Apex S Series delivers high motion stability, impressive levels of speed and accuracy and excellent affordability. Ideal for use within dedicated inspection departments or on the shop floor, the advanced machines feature a temperature compensation function allowing users to make accurate measurements in less than perfect environments.

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Foundrax launches next generation Brinell hardness testing machine

Foundrax, a leading specialist in Brinell hardness testing, is introducing its next generation Robus machine at Control 2019 in Stuttgart. It will also offer an exclusive preview of its new low force Brinell range of machines at the exhibition.

Alex Austin, MD of Foundrax, says: "We're excited to launch the new Robus machine at Control this year. This development delivers a high accuracy Brinell hardness testing capability from the most robust benchtop system on the market. Our machines deliver laboratory precision hardness testing in steelworks conditions and we pride ourselves on the accuracy, repeatability and lifespan of all our equipment. We have one example of a machine that has performed around 35,000,000 tests."

In addition to this new development, Foundrax will also present the larger floor standing BRIN400D, a rugged, shop floor Brinell hardness tester that carries out fully automatic indentation and measurement for production level applications. This robust

and reliable machine has been designed to meet the customer's most demanding requirements in harsh industrial environments such as those found in forges, foundries and steelworks.

Pioneers in Brinell hardness testing equipment, Foundrax was founded in 1948 with over 70 years of foundry, forge and steelworks experience. It is the only company in the world to specialise in Brinell hardness testing equipment and accessories. Foundrax designs and manufactures all of its own equipment, including custom built solutions to customers in 46 countries worldwide, serving sectors such as aerospace, power generation, automotive, leisure and construction.

In addition to its core business, Foundrax has recently launched factorysuppliers.com to source and supply materials testing equipment and consumables as well as thickness and roughness testing equipment. The range is ever expanding and also includes reference blocks and



metallographic materials used for cutting, grinding and polishing. Using its expertise in the field, Foundrax checks and ensures that every product meets expected quality levels before supplying to customers all over the world.

The company's machines are known for laboratory-level accuracy in steelworks conditions, efficiency and ease-of-maintenance, providing unparalleled confidence in its results.

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New release focuses on efficiency in production management



Lantek Global Release 2019 incorporates over 60 important new features into the company's solutions for the design and cutting of sheet metal parts and production planning. The evolution of its software allows its products to reach new levels in facilitating and streamlining production, providing total visibility and control of processes.

A multinational leading company in the development and sale of CAD-CAM/MES/ERP and pioneer in the digital transformation of companies operating in the sheet metal and fabrication industry around the world, Lantek has announced new features that have been incorporated in its 2019 version of software solutions, which are included in its Lantek Global Release 2019.

The aim of the new features is to extract and use data generated in the daily operation of factories so that it can be used to optimise the processes and analysed to enable knowledge-based decision making. In the release, Lantek has included over 60 new features focused on production management and the integral automation of technology.

"In the current connected world, there is little doubt that data is the raw material that enables progress in manufacturing development, adding value and providing a

competitive advantage in the market", says Asier Ortiz, technical director (CTO) of Lantek. "With this in mind, a major part of Lantek's R&D effort has been aimed precisely at how to obtain quality data from different vectors to allow the integral control and management of any cutting machine and process. This enables us to provide global visibility, raise the production levels and increase agility, while reducing complexity."

Focusing on its aim to help companies to manufacture better and more efficiently, using the latest technological advances, for example AI, Cloud and machine-learning, and to give the machines greater connectivity and automation, Lantek Global Release 2019 provides users with the following improvements:

Lantek Expert: automation and traceability

Lantek has taken a new step in order to attend to the needs of a market that demands greater efficiency in processes and time saving on common tasks. Continual collaboration with its clients has resulted in over 40 general improvements within its popular Lantek Expert CAD/CAM 2D sheet metal cutting software.

These include innovative technology for managing the destruction of holes, skeletons, and remnants, to assist the operator in the evacuation of finished parts. Automated processes have also been introduced to simplify workflow. By

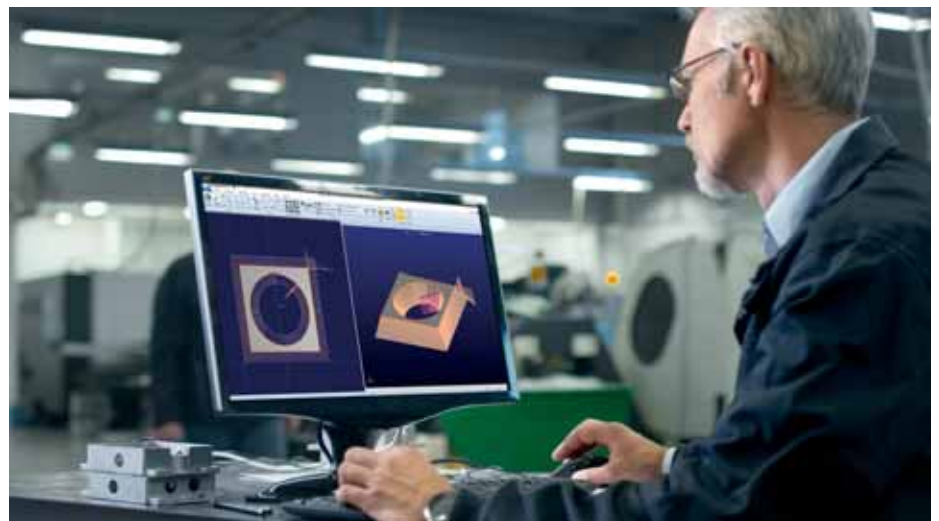
automating tasks, routine processes are concatenated and nesting groupings can be improved according to the customer's needs.

To resolve part identification and traceability requirements, Lantek has increased the possibilities within its parts databases, so that parts can be marked with QR codes automatically and semi-automatically in addition to marking metal sheets and remnants. This innovation makes it possible to encapsulate the information associated with the part. This may include the operations and characteristics that must be incorporated into the part once it is cut (colour, processing, bending, etc.).

Lantek has also optimised data collection and control capabilities, increasing its cutting machine database, which, at present, includes over 1,200 models from practically every manufacturer on the market, as well as improving the quality of production data collected.

Integration with design programs

For improved integration and management of 3D models for the cutting and bending process, the 2019 version has been enhanced with the integration of the main CAD systems. This important development increases the possibilities for working with programs and files incorporating all of the main 3D graphic formats that are currently on the market. The system can now also



manage different bending parameters for each operation, such as bend length, bend angle, bend radius, K-factor, special bends, rotation or tool change and is able to generate STL files (which allow for 3D part viewing) and DXF files, which can generate CNC code; and LSTC files, with all the bending information.

Lantek Flex3d Tubes, increasing efficiency in tube cutting

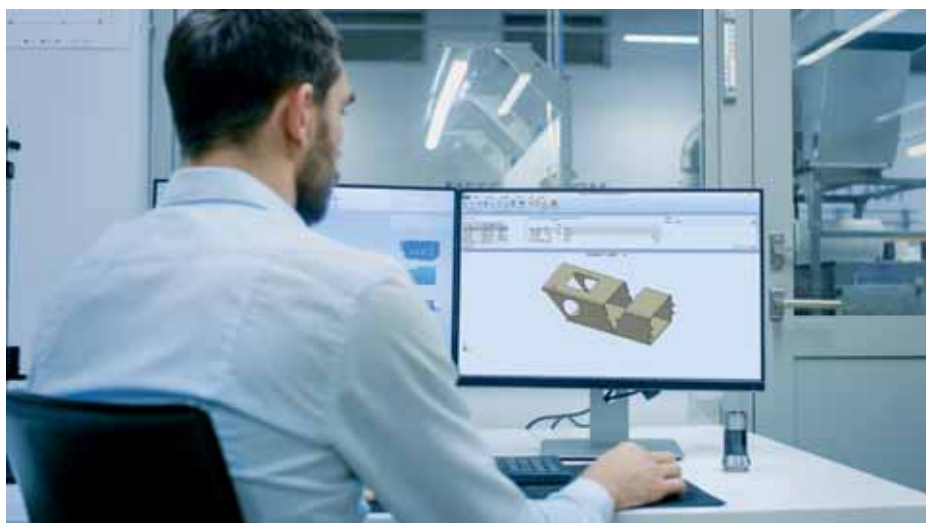
The 2019 version incorporates new machine models and includes the latest different methodologies for laser tube cutting. Optimised cutting depends on the mechanical capacity of the machine and, for the operator, simplification of cutting management, management of remnants and the evacuation of the part.

Lantek MES, for efficient production management

Adequate production management and planning is one of the keys to achieving success in manufacturing processes in the factories of the future. Lantek MES incorporates a total of 19 highly significant new features, with the objective of finding new ways to optimise production.

Users will now be able to see production planning fully and in real time in different views, sequences or Gantt charts, thanks to the new Lantek MES Monitoring module. The simplicity, power, and immediacy of this module keeps daily production always in the spotlight.

Added to this is a series of general efficiency improvements: nesting with sheet metal selection, entire production



traceability, data collection and improvement of data quality in more ranges of machines, reports, and filters, amongst other enhancements.

“Our only aim with this full repertoire of improvements is to give Lantek solutions new power to help production managers even more quickly and easily. With the data tracking and analysis that we can carry out, we are ready to bring intelligent manufacturing closer to a sector that needs to move towards Industry 4.0 to remain competitive. To make this a reality, we have transformed our clients’ needs into powerful manufacturing and management tools. This update is truly worthwhile.” says Asier Ortiz.

Lantek is a multinational which is leading the digital transformation of companies in the sheet metal and fabrication industry. With its patented manufacturing intelligence software, it enables factories to

be connected, turning them into Smart Factories. It rounds off its range of services with CAD, CAM, MES and ERP solutions for companies that manufacture parts from sheet metal, tubes and profiles using any cutting technology (laser, plasma, oxycut, waterjet, shearing and punching).

Founded in 1986 in the Basque Country (Spain), one of the main European hubs of machine tool development, Lantek enables the integration of sheet metal and metal processing technologies using the most advanced manufacturing management software.

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Automated intelligent manufacturing and feature technology

Paul Scally, operations manager at Tebis UK explains about Tebis automation and the features-based technology

Firstly, why do companies need Tebis automation? Many companies have engineers who are programming in different ways, there is inconsistent quality in the parts or maybe they are not getting the best use out of their CAD/CAM systems and this is where Tebis can help. What we aim to do is to standardise your processes with automation and improve the quality with all the components at the same time.

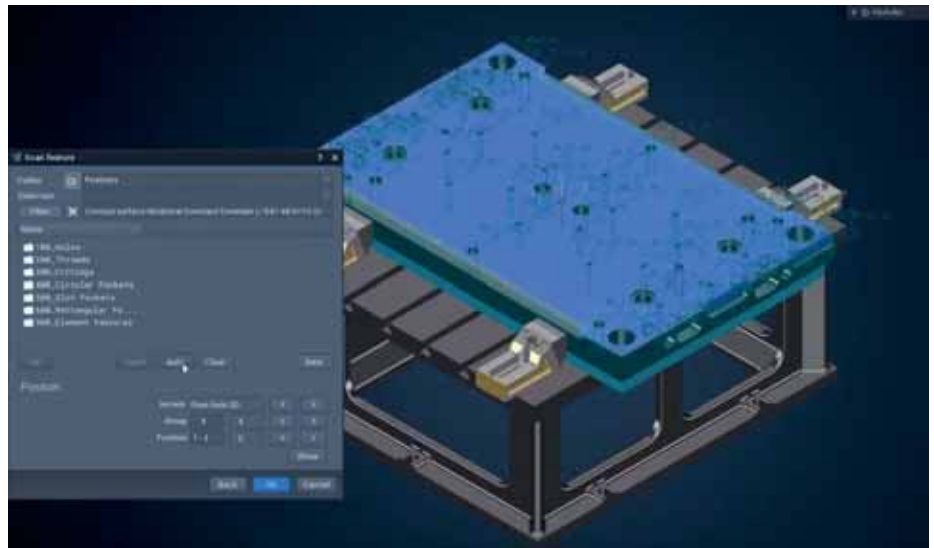
Feature based technology

Tebis can scan a component and auto-detect all for these features from CAD-geometry. In Tebis there are the libraries with the features and attached to these features are variables. The cutting hole can be ranged, for example, from 5 mm to 8 mm. The software can then automate the machine process with variables, picking up the correct tools for the correct size hole automatically."

Templates

Tebis has the technology packages which it can help to start with, or alternatively can end out an engineer who can come and help the user to set up everything. Tebis will make sure that the software is working in the most efficient manner from the beginning.

Moving to the next subject, let me explain how the colour coding works. Tebis can apply different surface finish or tolerance to part colours. When you apply these to CAD geometry with the feature-based technology with standard automation or the whole process automation, the software can actually give the correct surface finish and strategy directly to these objects automatically. Tebis has also built in a filtering system which allows us to link the automation. The system is not just running



external plug-ins; it is all built within the software so it will not break if you have new release of the software.

The centralised tool library is the one to start with. This sounds easy, but in reality on certain software we have the tool library on one PC and a tool library on a different PC and maybe these are running out of sync. We have these located on shared server drive, so everybody gets the latest version if something is updated and it's the same with machine tools, where Tebis has Virtual Machine technology with all the limits built in into the machine. This can be used in the programming environment, so it is not possible to produce a toolpath which is not achievable in reality. All of these things are built up to make very stable and safe processes to protect your business.

Tebis also can store manufacturing knowledge inside the software if a company wants to bring a new engineer on a board, then with the automation it will be a very fast way to get people to program and achieve the same quality in very short period of time. As an example, it is not just the feature-based technology which we talk about in automation, it could be the whole machining process. If we take a look at a video where the car is being machined, then the whole process is completely automated with automated tool direction, but this doesn't have to be a car, it can be anything.

Finally, I would point out that, in most businesses, standards for cutting tools, speeds and feeds, stopovers are most likely written down and are being used by an engineer on a day to day basis. The Tebis template technology allows all this information to be stored and used efficiently and automatically and has the toolpath still made very quickly to a high quality at the same time.



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hyperMILL – a tradition of CAM innovation

OPEN MIND celebrates its 25th company anniversary

OPEN MIND Technologies AG is celebrating its 25th company anniversary. The hyperMILL® CAD/CAM suite has enabled OPEN MIND to become one of the world's leading providers in the market. It is now considered a cutting-edge company from a technological perspective in many sectors. OPEN MIND has significantly shaped and driven forward the development of modern 5-axis simultaneous machining in tool and mould manufacturing. It attends to the needs of users across all industries and is now represented by its own sales and service subsidiaries in 15 countries.

25 years after the company was first founded, all signs appeared to indicate further growth at OPEN MIND. The CAD/CAM specialist had 305 employees at the end of 2018. By the end of its anniversary year, this number is set to grow to over 330 with new subsidiaries will start to operate. "We began with just 20 employees, but our love for technology and our innovative spirit are something that has not changed throughout the years," says Dr Josef Koch, CTO and one of the founders of OPEN MIND.



Dr Josef Koch, CTO and one of the founders of OPEN MIND

Strong customer relationships

With subsidiaries across the globe, OPEN MIND embodies the motto of 'Think

globally, act locally.' The software developer attaches great importance to being close to its customers across the world in order to be able to offer them direct consultation and optimal service on-site.

Two hyperMILL releases each year guarantee that current developments and requirements are implemented in the software for tool and mould making, as well as the automotive, aviation, production machining and energy industries. The internal innovation team seeks out new approaches and technologies to develop even more efficient solutions to global manufacturing challenges.

Customers in all industry sectors benefit from continuous time and cost savings, as well as increases in efficiency and quality.

"We understand our users' day-to-day practice down to a tee and love our software and this is what motivates us to continue to develop innovative ideas, even after 25 years, and to further improve hyperMILL", says Dr Koch. "We are pioneers in 5-axis processing, and we continue to embody this pioneering spirit. In the future, this will be our utmost challenge, getting the most out of machines and tools.

"With the aid of efficient processing strategies and our very own postprocessors, we have succeeded, time and time again in getting the most out of machines and further increasing process reliability, from the design to the machine. Alongside speed and surface quality, we always keep an eye on one further cost factor for the user, i.e. machine and tool-friendly processing to extend tool lives and maintenance cycles," says Volker Nesehöner, CEO at OPEN MIND Technologies AG, explaining the key to the company's success. "In addition to being able to offer the typical benefits of a CAM manufacturer, we have been availing ourselves of further options for optimising processing methods over the last few years. We have managed to intensify cooperative relationships with our partners. We also support progressive process automation and the integration of additive manufacturing processes with our solutions."

Innovations, special procedures, and solution packages

hyperMILL now serves all types of cutting



Volker Nesehöner, CEO at Open Mind Technologies AG.

processing, from 2.5D, 3D, 5-axis, and 5-axis simultaneous machining to procedures such as mill turning. hyperMILL MAXX Machining, our very own performance package, sets totally new standards in optimising HPC tasks for both roughing and finishing. Specialised packages, such as for turbomachinery construction or the manufacturing of tire moulds, offer tailor-made solutions for specific production areas. The software suite offers a complete solution, especially in conjunction with our own CAD software hyperCAD®-S, which is tailored to the requirements of CAM users. With the aid of the cutting-edge simulation solution hyperMILL VIRTUAL Machining, the essential interconnection between CAM and the machine is made a reality and implemented, thus achieving a milestone in implementing Industry 4.0 in manufacturing.

On the 25th anniversary of OPEN MIND, one thing is for sure: hyperMILL is well-prepared for new customers and future success, as it consistently develops its state-of-the-art software technologies.

OPEN MIND Technologies

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Adding a waterjet to your machine shop

Every precision CNC machine shop contains multiple types of equipment. They often utilise mills, lathes, multi-axis machine centers, grinders, EDM machines and precision hones. The goal of any machine shop is to add value to a product through the manufacturing process. Abrasive waterjet machines should have a common place within a machine shop because they add value by eliminating non-value-add time and creating geometry that is both common and/or not possible with traditional CNC machines.

The average machine shop sometimes views waterjet as a low precision device, only rough cutting as a material-prep operation. However, that would be a misconception. At the OMAX Corporation's facility in Kent, Washington, a waterjet centre produces parts that are used in manufacturing its own waterjets. The waterjet cell has produced and maintained over three-hundred-thousand 1.5" thick, heat-treated, 4340 steel motor plates all within 0.005" tolerance. This tolerance is straight off the waterjet without any secondary machining.

As a standard, the OMAX line of waterjets maintains a range of accuracies rivaling any common commercial machine tool. This precision is achieved through linear encoder drive systems, software cutting models, ridged construction and OMAX's direct drive pump system. The direct drive pumps allow for less fluctuation in the cutting



stream, resulting in a steadier, more consistent jet stream.

Not only is a waterjet a precision cutting tool, it is also very fast compared to traditional CNC machines.

When CNC machining, raw material has to be turned into chips, as the mill doesn't do a very good job removing a chunk of material like a waterjet or a saw does. Adding in the cycle time, to turn both external chunks and internal windows into chips, could drive a mill-only solution to a cycle time twice that of the waterjet.

The setup time is drastically less when

using a waterjet. Since an OMAX waterjet does not have any heavy, cumbersome, or time consuming fixturing the setup is relatively easy. Material, usually plate, is set on the abrasive waterjet's cutting table and clamped into place. Traditional CNC machines can average 2.5 hours per job setup. Each type of CNC utilises its own workholding devices that are usually extremely heavy to standup to the physics of working within the machine. In addition, CNCs often need several cutting tools for a single part. All of these tools need to be loaded into the respective CNC machine and referenced.

Traditional CNC machine typically use specialised and very costly software. These CAM programs often need a highly skilled



individual. Common CAM software includes MasterCAM and Esprit.

With IntelliMAX, OMAX offers an easy-to-use alternative. From the hobbyist to a precision CNC machinist, IntelliMAX has proven that a powerful machine tool controller can be intuitive. From start to finish a typical new operator can generate a cut-path very quickly within the first day of use. IntelliMAX is an all-in-one package CAD/CAM suite including LAYOUT and MAKE. The software can control individual part features. For example, the perimeter of part could be cut at a faster cut-quality while more precise features within could be cut with a slower/finer quality, which enables various part tolerances to be met. IntelliMAX's LAYOUT CAD program is a quick way to get mental geometry onto the computer screen and the drawing is easily and accurately exportable to CAM software.

Quoting a job or understanding the cost/time of a particular cut is easy with OMAX software. IntelliMAX is very advantageous for job shops because the process of quoting a job takes a fraction of the time of traditional CAD/CAM software. It often takes hours/days to generate a software-driven quote from traditional CNC CAM software. Simply drop the customer file into OMAX software, select a few parameters and an accurate cycle time is generated for quoting purposes.

OMAX abrasive waterjets are the Swiss army knives of the machine tool world. Abrasive waterjet can cut with a small kerf like a saw, cut external geometry for near net production, cut round parts like a lathe, cut square parts like a mill, cut complex parts like a wire EDM and cut slots like a broach. This advanced versatility allows



waterjet to be a large multi-tasker in your machine shop or to complement your other machine tools by balancing capacities.

Waterjet can move quickly through difficult-to-machine materials, like titanium. In many cases, waterjet can cut titanium faster than traditional CNC machines.

Abrasive waterjet is capable of performing most of the work on a part leaving finish work for CNC machine to focus on. For example, waterjet can leave a small amount of material of a surface for CNC to remove vs. roughing and finishing all features in CNC.

If your shop is bringing in additive manufacturing, OMAX abrasive waterjet is a perfect partner. Often, when a part is created by additive manufacturing, the part requires a skeleton structure to support it during the manufacturing process. The skeleton structure usually needs to be



removed. Waterjet can easily remove the skeleton features, regardless of material type.

Not only does waterjet aid your machining practices, it also is a great return on your investment. OMAX abrasive waterjet cuts down on non-value add time. At the OMAX plant in Washington, on average each CNC setup consumes approximately 2.5 hours. In comparison, an OMAX US waterjet customer consumes approximately 15 minutes of setup time. That's a saving of 2.25 hours in setup alone. If the burden rate of a CNC machine is \$100 per hour, a customer would save \$225 every time they set up a job. If the customer sets up and runs five jobs a day, they save \$1,125 per day or \$5,625 per week. Going further, the customer saves \$24,187.50 per month, \$290,250 per year. Most companies and banks want the machine to pay for itself within 24 months. With OMAX abrasive waterjets you can see how it will pay off in a fraction of the time.



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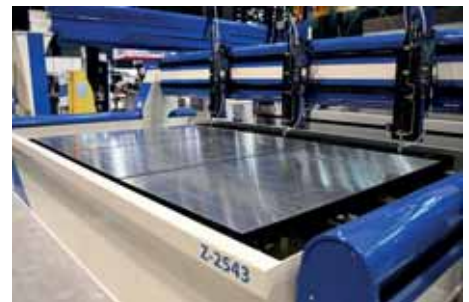
Waterjet cutting systems added to impressive product portfolio

Already firmly established as a leading global supplier of advanced CNC routing, cutting and finishing solutions to a wide range of industries, XYZ Automation Group has recently added waterjet cutting systems to its extensive product portfolio. The decision followed acquisition by the parent company in Canada of the US-based WARDJet, a specialist manufacturer of waterjet cutting systems and pioneer in the advancement of waterjet cutting technology.

This development now enables XYZ Automation Group to offer alternative cutting solutions to a wider range of industries and, in particular, those processing materials that traditional CNC routing and cutting systems cannot handle. Typically, these include stainless steel, cast and wrought iron, various alloys such as brass and bronze, solid rubber and rubber composites, glass, fibreglass and high-density plastics. It will also open up new business opportunities in, for example, the aerospace, automotive, metal and glass fabrication, plating/finishing and electric/electronics sectors for which waterjet cutting technology is the most appropriate option.

Currently, XYZ Automation Group in the UK is offering the large-format X-Series and the more compact and recently introduced A-Series of WARDJet machines. They have individual as well as common design and performance characteristics that will accommodate the different requirements of high-volume manufacturing, small shop/machining centre parts and components production at arguably the most competitive prices available.

Both machines are based on a lightweight and rigidly constructed modular steel frame gantry for robust and reliable operation. They also incorporate multiple cutting heads, an industrial-grade rack and pinion drive system for more precise cutting and the avoidance of problems that are frequently experienced with low-cost belt-driven systems as well as an optional water level control system and cutting table enclosure to allow materials to be processed underwater. These also help reduce splashback and consequent loss of water



whilst greatly reducing noise generated by the cutting process and enhancing the environmental credentials of both machines. The proprietary dedicated Move motion control software is also provided as standard on both the X-Series and A-Series machines.

The latest A-0612 model in the A-Series has been developed to accommodate a market sector with hitherto limited options. With a relatively small 213 x 124 cm footprint, it will fit perfectly into the workflow of any small engineering shop or machining centre. It is an ideal solution for situations where available space is at a premium for which the cutting power of larger waterjet machines is required without any compromise on functionality and quality of output.

A key benefit of the A-0612 machine is that while similarly positioned waterjet systems operate at pressures ranging from 30,000 to 45,000 psi, the A-0612 will operate at 60,000 psi. This enables the

processing of any material within the same time frame as that taken by a full-size waterjet machine. Operating at this higher pressure also reduces the amount of abrasive needed for the cutting process, thereby further reducing production costs. The compact size of the A-0612 also makes for easier transportation, installation and portability.

Examples of the X-Series and A-Series of waterjet cutting machines can be viewed at XYZ Automation Group's main showroom and demonstration facility in Telford.

For further information and/or to arrange a machine demonstration, contact:

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Efficient fine waterjet cutting with automatic angle error compensation

Waterjet solutions



StM now equips its micro waterjet cutting system "MicroCut" with the new "StM TAC/12" angle error compensation cutting head as standard. The compact high-performance system is a decisive step ahead of the competition in terms of precision and speed in the mass production of highly functional miniature components.

Today, the supplier has the advantage of being able to produce ever smaller and lighter component series in first-class quality, without thermally deforming the surface. Those who can meet this challenge quickly and economically are even further ahead. This applies, above all, to the processing of ceramic, glass, plastic, non-ferrous metal, steel and composite materials that are required in the smallest parts, especially for the electrical, automotive, aviation and medical industries. Reason enough for the waterjet specialist StM to offer an all-round pragmatic solution for this growth market: A powerful micro waterjet cutting system with automatic angle error compensation. This system works 10 times more accurately than classic waterjet cutting systems.

The high-tech MicroCut system, in combination with the new "StM TAC/12" cutting head, can produce tiny workpieces with up to 10 µm at right angles and with inner radii of up to 0.1 mm quietly, cleanly and at top speed. MicroCut can easily cut even holes or nested parts because the classic angular error during waterjet cutting is automatically compensated. The integrated height sensing ensures smooth operation hereby. What's more, like all StM systems, the entire system is trimmed down to the last detail for performance, user comfort and economy. The starting price for the system is €183,000 without high-pressure pump and it can be delivered with

all accessories within 20 weeks. For further information, visit: www.stm.at.

With the new MicroCut MJ, the innovative design in combination with the angle error compensation of cutting head StM TAC/12 guarantees minimum cutting widths of up to 0.2 mm with a positioning and repeat accuracy of 0.0025 mm. The abrasive content can be infinitely adjusted to any surface and cutting task. The surface quality, with up to RA 0.8 µm, is similar to grinding. Cutting sequence, start and end points can be chosen randomly. The tool's small jet diameter of <0.2 mm results in high cutting and cut-edge quality which contributes to sharp-edged contours and very high material efficiency. Process forces and thermal loads are minimal and the formation of toxic gases is avoided completely. The system is completely encapsulated and mounted on a low-vibration granite frame

connected to a variable high-precision clamping frame. With this, workpieces up to a size of 800 x 1000 mm can be precisely aligned and securely fastened. Guide units with highly dynamic linear motor drives guarantee first-class performance and precision while making it possible to dispense with cost-intensive wearing parts like couplings, gears and gearboxes.

The new control panel with proven SmartTouch system, the integrated control via intelligent SmartCut CAD/CAM software and special protection devices for dirt and noise ensure maximum user friendliness and limitless strategic scope for production. In addition to the thermally and physically separate stainless-steel water basin, the exclusive use of branded components ensures reliable cutting and wear resistance. In fact, the MicroCut enables fully automatic production with the highest possible degree of precision. Moreover, thanks to the modular StM design, the system can be adapted to highly specialised cutting tasks down to the last detail and retrofitted at any time.

MicroCut's hidden advantage

The new cutting head StM TAC/12 represents a decisive competitive advantage, especially in the production of



miniature components. This is because it prevents the usual deviation between the upper and lower edges of the cutting material: The angle error. This occurs when the waterjet loses power during cutting and more material is removed from the top than from the bottom. The result is a V-shaped taper at the cutting edge which is disastrous for precision components. Particularly with thin materials, e.g. 2 mm stainless steel, the otherwise insignificant angle error produces a deviation of up to seven degrees. The cutting speed is normally reduced to prevent this. However, this leads to longer production times and therefore higher costs. The solution to this is the StM cutting head with integrated taper angle control. With a swivel range of up to 12 degrees, the head compensates the cutting angle error through a swivelling movement enabling work with even greater precision at higher rates of feed.

The StM TAC/12 cutting head automatically compensates the angle error to below +/-0.01 mm. The compact cutting head can easily be retrofitted to existing StM waterjet cutting systems of all model series. The cutting head has integrated

height sensing and collision protection to ensure reliable operation. The encapsulated mechanics do not require sealing air and the motors ensure wear resistance and easy maintenance. StM again fulfils its mission to offer practical solutions for the high-quality, economical and comfortable cutting of materials of all kinds.

Interested customers can perform a test cut or watch a demonstration to check the performance of the StM fine waterjet cutting systems without obligation, at any time, at the StM waterjet centre in Schweinfurt. Upon request, you can also get a free system solution including cost-benefit analysis to allow you to assess the suitability of the new compact MicroCut system in terms of your requirements. In addition, StM will present its waterjet cutting systems at Blechexpo. The event takes place in Stuttgart from early November.

StM is a leading provider of waterjet cutting systems with head offices in Eben, Austria and Schweinfurt, Germany. For more than 25 years, the traditional company has developed integrated solutions, mainly for the steel, aluminium, metal, plastic, stone and glass industries, which are most notable

for their efficiency, ease-of-use and resistance to wear. Since 2018, the company has also held the sole production rights to BYSTRONIC waterjet cutting systems. StM stands for standard CNC controlled portal systems in all dimensions and for all applications. In addition to economy, standard quality and excellent customer service, StM attaches particular importance to innovative modular system technology.

The brand manufacturer thus ensures that its individual manufacturing processes are continually matched to the latest requirements of its customers. The Group has locations in Austria, Germany and Switzerland, employs a total of 70 people and is represented in countries worldwide.

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Waterjet innovation leads the way

For over 27 years, Waterjet Corporation has been developing and manufacturing a wide range of CNC multi-axis waterjet cutting systems, including standard models in various sizes as well as customised machines; a history marked by a steady development and a continuous effort towards total quality and technological research; a passion that has allowed the company to expand its presence at international level, thanks to a well-established sales network consisting of direct subsidiaries as well as local importers and distributors.

Waterjet Corporation's headquarters are in Monza, Italy, with regional branches located in the US (WaterJet USA LLC, Chicago, IL) and in the United Arab Emirates (Waterjet Middle East FZCO, Dubai).

Waterjet technology is mainly applied for the processing of metal, stone, glass, plastics and composite materials. It doesn't require subsequent process on the cutted piece. As a cold cut, it doesn't produce any mechanical nor thermal deformation, has no limits in thickness and has a simple functionality, thanks to the usage of the same tool, i.e. abrasive sand pushed by the water jet at 4,000/6,000 bar pressure, with the same conditions for most materials.

At Mescpe, Palma and MACH for example, it exhibited the compact model CLASSICA CL44. This is a machine characterised by a bridge system, equipped with a 3-axis machining centre with an integrated stainless-steel tank with a thickness of 8 mm. The movements of the axes are obtained by rack & pinion motion system, ball screw motion system and linear guideways with preloaded bearings. The transmission has an automatic lubrication system.

The company's machines are guaranteed a very high standard of processing precision and reliability and are highly customisable according to the specific needs of the customer. Waterjet machines can be equipped with the following highly innovative integrated systems: supersonic waterjet cutting 4 Mach EDGE 5™ with five interpolating axes and integrated ITC™ function (Intelligent Taper Control); the high-definition hybrid Plasma-Waterjet cutting system with combined waterjet and plasma cutting systems up to 260 AMP Hypertherm; the HYDROFINISH System, an

innovative device which is able to texture and decorate the surface of all types of material with high pressure water only so, it's also an environmentally friendly technology.

Waterjet Corporation's own research and development centre tests all the new technologies before distributing them on the market. The quality control complies with the ISO 9001-2008 procedures and guarantees the CE conformity of all the components produced and the machine.

The Waterjet offer is complemented by an after-sales service guaranteed by a team of highly specialised technicians. Service activities that accompany the life cycle of a machine supplied by the company are as follows: technical assistance during and out of warranty; tele-online assistance; supply of original spare parts and consumable products; installation and training on the use of the machine; CNC and software updates; periodic maintenance contracts.

A series of important milestones have marked the company's activity. It was awarded as best in Brianza in the Internationalisation category during the gala evening of the BTOB AWARDS 2016. In January 2018 it received, for the 9th



consecutive year, the recognition as the best original manufacturer of water cutting machinery with KMT pumps, its American partner. The international style of the company is also dictated by a modern marketing strategy. In addition to the new website you can also find it on the main social networks (Twitter, LinkedIn, Facebook, Google Plus and Pinterest) where news, events, videos are posted and where you can find illustrated the wide range of its waterjet cutting machines.

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Flow Waterjet ups the ante with Joe Gibbs Racing

Flow International Corporation, a leading developer and manufacturer of ultrahigh-pressure waterjet solutions for cutting applications, has announced a new partnership with Joe Gibbs Racing. A current competitor in the NASCAR Monster Energy Cup Series and The NASCAR Xfinity Series, North Carolina based Joe Gibbs Racing is looking to Flow's elite waterjet technology to support the team's endeavours during the 2019 season and beyond.

Joe Gibbs Racing has added a Mach 500 4020 with a Dynamic XD[®] cutting head and HyperJet[®] Pump to its production operations at its Huntersville facility. With high-precision, multi-axis cutting capabilities, the addition will expand the team's ability to design and manufacture custom performance parts necessary to maintain a competitive edge on the track.

Mark Bringle, technical partner activation manager of Joe Gibbs Racing, says: "At this level of competition, precision is everything. This machine is the perfect combination of reliability, accuracy and speed we need to

produce the parts that keep our cars at peak performance. This is a huge opportunity for us."

As one of Flow's signature workhorse systems, the Mach 500's precision engineering makes it the quickest and most accurate production waterjet on the market. The team's newly acquired unit is configured with a Dynamic XD cutting head, capable of complex bevel and compound angle cutting with 5-axis motion for maximum flexibility as well as Flow's HyperJet pump creating ultrahigh-pressure up to 94,000 psi.

Jim Jenson, president of Flow International, comments: "It's exciting for me to see our products contribute to real world results at the highest competitive level and as a personal fan, it's an honour to give the team over at Joe Gibbs Racing the tools they need to succeed. Partnerships like this one are why we strive to be the best we can be."

This season, Flow is represented on the legendary No. 19 car, driven by full-time NASCAR Xfinity Driver Brandon Jones.



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TRUMPF focuses artificial intelligence

At the recent TRUMPF INTECH in-house trade show in Ditzingen, a key emphasis was the company's commitment to develop Artificial Intelligence solutions.

The gathered journalists were treated to interviews with CTO Peter Leibinger chief digital officer Matthias Kammüller, who explained the importance of this advanced technology for the German sheet metal specialist.

TRUMPF's development department is currently training an artificial intelligence system to carry out that process autonomously. One method operators use to teach the AI is by highlighting images on a computer showing weld seams that fall inside and outside the pre-defined tolerance range. The AI learns from this process, creating rules that it can subsequently use to determine whether a weld seam falls within

time-consuming manual work by eliminating the need for workers to check each weld individually.

The older the better: AI assists fully automatic TRUMPF laser machine

The fully automatic TruLaser Center 7030 laser system cuts parts from a metal sheet and removes them from the machine. These cut parts come in an almost endless assortment of shapes, sizes and thicknesses. The machine has to remove them from the sheet in a variety of ways using suction cups and pins, otherwise the part could get jammed and bring the machine to a halt. With over 2,500 suction cups available to release parts from the scrap skeleton, part removal often succeeds at the first attempt. If it doesn't, the machine can autonomously decide to repeat its efforts however many times are necessary. The 180 pins used to press the part out of the scrap skeleton simply try a different way of getting the job done. This method will soon work even more efficiently thanks to an AI solution currently being developed by TRUMPF engineers. Whenever part removal fails at the first attempt but then subsequently succeeds, this produces data. TRUMPF analyses and compares this data in an automated and centralised process.

The results of this data comparison can then be transferred from one machine to all



TRUMPF is a leading user and a leading provider of digitally connected manufacturing solutions and that makes artificial intelligence a key part of its business. AI can play a role in many different areas, from service and maintenance to development. Here are just a few examples:

Using AI to make better electric motors for future mobility

The increasing popularity of e-mobility is fuelling the production of millions of electric motors. A new technique is making electric motor manufacturing more efficient by replacing the time-consuming process of winding thick copper wire around the coils. Known as the 'hairpin' method, it uses a compressed-air pistol to fire a rectangular copper wire, similar to a hairpin, straight into each slot in the stator. A laser then welds the wires together, creating a coil. Traditional image processing algorithms determine the position of the hairpin to find exactly the right welding point for the laser. The quality of the welds can vary, however, and if a weld seam does not meet the pre-defined criteria, the motor needs to be removed from the line.

the required tolerances. If a seam fails to fulfil the defined criteria, the AI generates a corresponding notification. As well as ensuring consistently high weld seam quality, this AI solution dispenses with



the other machines of the same type. In this way, the other machines learn the best way to remove a similar part at the first attempt. These systems will improve continuously in the future based on data from hundreds of thousands of customer reports.

Identifying bottlenecks: using AI for quality control on the shop floor

Without artificial intelligence, it would be almost impossible to perform quality assurance testing on the production line for flatbed laser machines at the TRUMPF facility in Grüşch, Switzerland. That's because laser machines are becoming more and more complex. In the past, any anomalies detected during test operation would typically result in a production worker having to examine all the parts and replace them as necessary, a time-consuming and resource-intensive job that was not even guaranteed to succeed. However, now the production team is working with an AI solution developed by TRUMPF in Ditzingen

to ensure all the machines it makes are of the very highest quality. Sensors in the machine capture large quantities of data in a quick test and send it through the controller to the Cloud, where the AI solution performs an automatic analysis. Employing a clever combination of simulation, measurement and analysis techniques, the AI puts the machine through its paces in countless different operating scenarios. If it detects an anomaly in the data, it not only identifies the problem, but also uses the results of its analyses to determine how it should be remedied. This information automatically appears on the laptop screens of the quality management team at the TRUMPF plant in Grüşch. The engineers can then remedy the problem directly on site. A total of 4,500 machines have already been analysed using this procedure. With each new analysis, the AI expands its knowledge further, helping to improve the production of future machines.

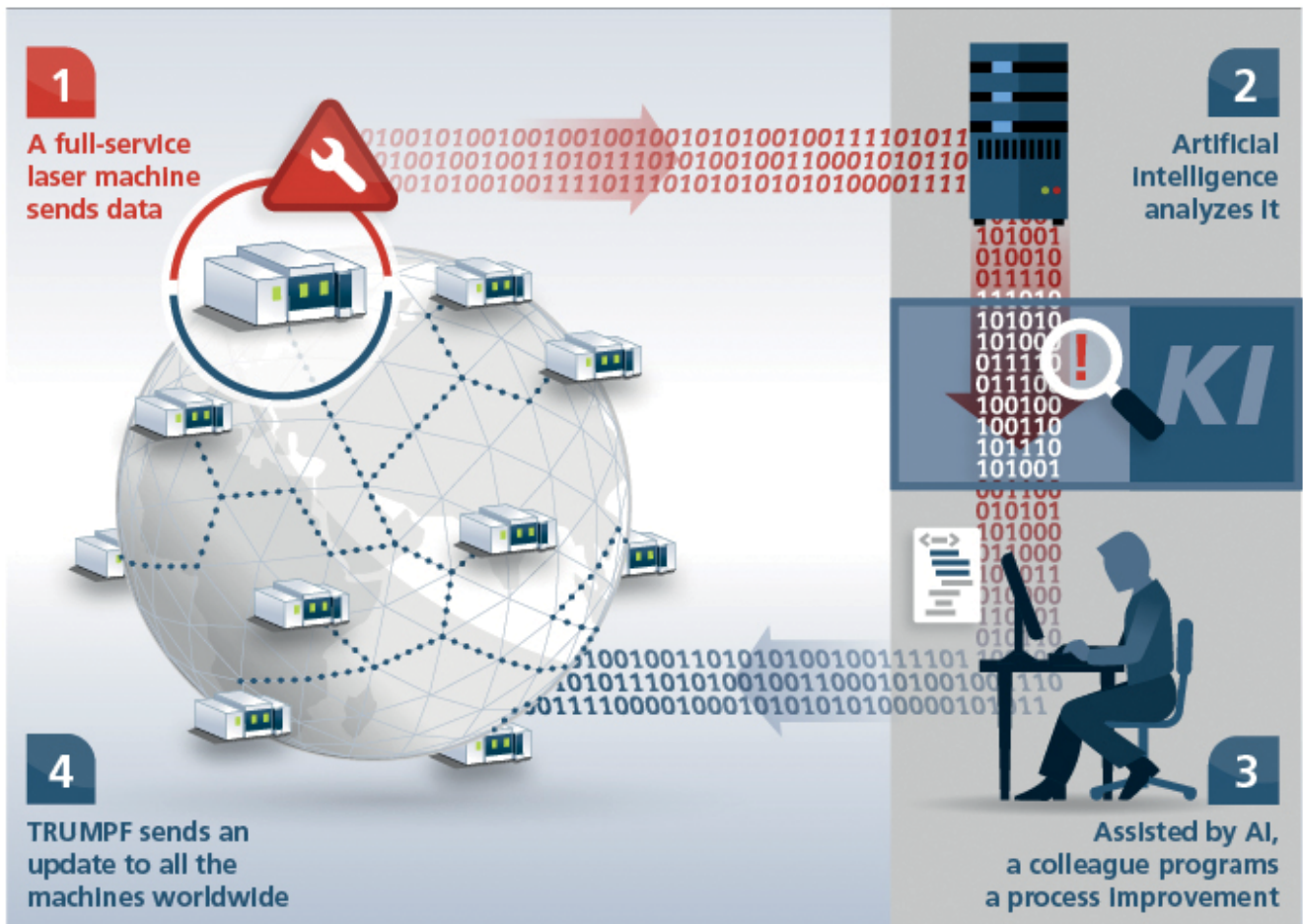
High-technology company TRUMPF

offers production solutions in the machine tool, laser and electronics sectors. It is driving digital connectivity in manufacturing industry through consulting, platform and software offers. TRUMPF is the world technological and market leader for machine tools used in flexible sheet metal processing, as well as for industrial lasers.

In 2017/18 the company, which has about 13,400 employees, achieved sales of nearly 3.6 billion euros. With over 70 subsidiaries, the TRUMPF Group is represented in nearly all the countries of Europe, North and South America, and Asia. It has production facilities in Germany, France, Great Britain, Italy, Austria, Switzerland, Poland, the Czech Republic, the USA, Mexico, China and Japan.

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Artificial intelligence at TRUMPF



Source: TRUMPF

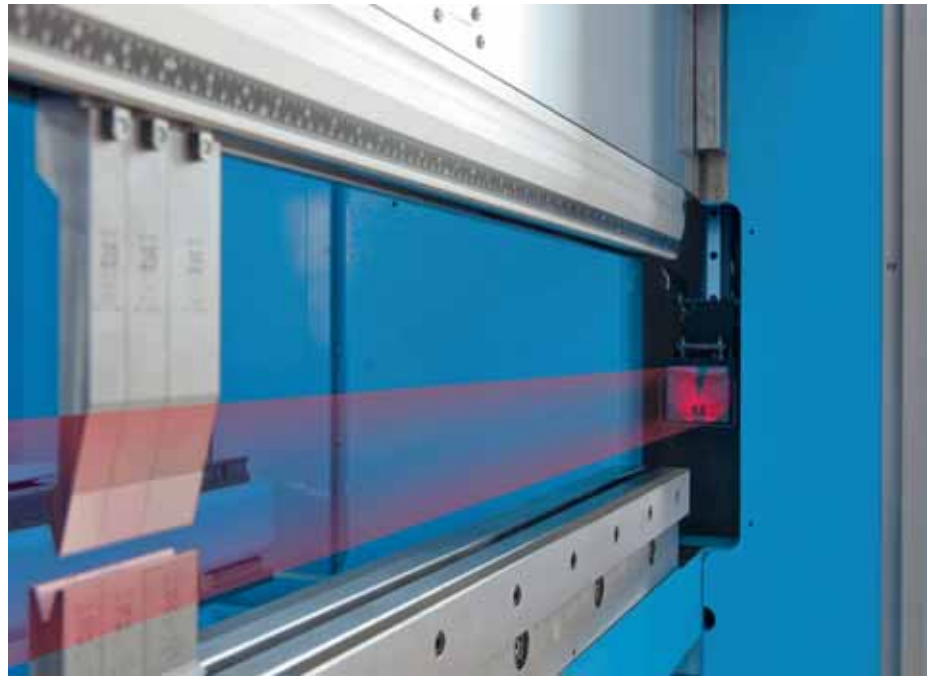
Servo-electric press brakes from Prima Power

For more than 20 years, Prima Power has been a true pioneer in applying servo electronics to sheet metal working machinery, including the Prima Power eP-Series Press Brake; a fast, accurate, non-hydraulic bending solution.

The innovative machine concept combines productivity, accuracy, flexibility and reliability with high respect to ecological considerations, an approach that Prima Power call "Green Means®". The concept offers sustainability, manufacturing efficiency and productivity, bringing greater versatility, lower power consumption, less maintenance and no oil to purchase or to dispose of. In addition, easy programming and outstanding accuracy eliminate waste production. Put simply, this means producing better sheet metal components at a lower cost.

The eP series includes four models to satisfy almost every customer need: from the most powerful and flexible eP-2040, 4,100 mm bending length / 200 tonne capacity, to the highly reliable and rigid eP-1336, 3,640 mm / 135 tonne, the mid-range, all-purpose eP-1030, 3,150 mm / 105 tonne and the eP-0520, 2,100 mm / 55 tonne, the smallest model in the family.

The eP-Series machines feature the advantages of high acceleration / deceleration and fast response times from the servo-electric drive system. Compared to conventional press brakes, considerable productivity increases can be achieved and cycle times can realistically see a reduction of 30 percent or more. The working speed of the machines is programmable, ensuring that bending can be done without a loss of



product quality or operator safety. The Lazer Safe IRIS System provides safe, high-speed closing down to just 2 mm. Compared with other guarding systems or even unguarded machines, the laser system can save around two or more seconds per cycle. Fast positioning speeds also ensure that the back gauge will always be ready when the part is presented for each operation.

The eP series feature a pulley belt system, actuated by Prima Electro servo drives, which distributes the bending force over the whole bending length. The system consists of fixed and moving rolls spread out over the total working length of the upper beam. The belt itself is a steel wire reinforced, maintenance free belt and the entire force is

transmitted through tension, a simple and highly reliable solution. Servo motor drives offer superior movement control and accuracy, with thermal influences on precision eliminated through the absence of oil.

The steel reinforced belts in the system are made of modified polyurethane and are extremely flexible, hardwearing and durable. They are virtually corrosion resistant due to their galvanised steel and their polyurethane coating ensures anti-slip traction and efficient, smooth-running power transmission. In combination with an annual service contract, Prima Power give a 5-year warranty for the mechanical drive system.

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

The eP-series utilises the Prima Industrie Group's know-how in control technology and features the Prima Electro Open



Control. For maximum processing speed this MS Windows based control has two separate processors, one for real time operations and one for bending application tasks. A large, operator friendly touch screen user interface allows a significant improvement of data input rates and a considerable reduction in programming time. 2D graphical programming with automatic bending sequencing assist in making even first-time operators productive. Most bending applications are easily programmed using the 2D graphical on-line programming with auto sequencing.

For offline programming, AutoPOL is the easy-to-use and effective tool for the Prima Power eP-Press Brake. Sophisticated bending simulation makes it possible to shorten setup times and to make sure, in the office, that the bending task can be performed. 3D models can be created with AutoPOL's designer program or they can be imported in 2D and 3D format from any CAD program. AutoPOL's bend allowance algorithm also takes into account bending tools to obtain correct radii and thus correct unfolding dimensions. The 2D unfold pattern can be exported, as a DXF file, to be



used in programming punching and cutting machines also manufactured by Prima Power. AutoPOL includes a 3D designer for the designing of sheet metal parts, 2D and 3D file import functions, an unfold for automatic flat part calculation and a bend simulator for graphical programming and simulation.

Several options, such as a CNC crowning device, flattening table, hydraulic clamping,

angle control system and bending follower are additionally available to give the machine further versatility and allow it to meet almost every bending requirement.

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Software produces right-first-time parts

During 2018, Holmfirth-based sheet metal design and engineering specialists Allsops Ltd upgraded its bending capability with the addition of two Xpert 40 Bystronic press brakes having a bending length of one metre and a stroke of 200 mm. Raising the number of press brakes on site from this supplier and predecessor companies to 11, they provide a much more efficient platform for bending smaller parts than is possible using a 3 m capacity machine, which necessarily has slower axis movements.

File to part is quick and accurate

Further benefits come from Allsop's use of the Swiss manufacturer's BySoft 7 software to program both the fibre laser cutting machines and the new press brakes. It results in seamless, rapid progression from cutting the blank to bending and guarantees accuracy of the first-off part. This is invaluable for economy of production when dealing with prototypes and short runs. The software includes simulation of the bending sequence to identify any impending collisions.

Allsop's technical director Stephane Lericolais says: "We previously used generic programming software for laser cutting and bending, but since 2010 we have standardised on BySoft 7. It imports our customers' 3-D CAD models, flattens them and automatically generates programs offline for cutting the parts, nesting them

optimally within a 3 x 1.5 m sheet, and then bending them accurately.

"We know that the first part will be within tolerance whereas previously, before producing a prototype or starting a batch run, we would have to cut a blank, calculate the bend allowance, fold the part, check it for accuracy and have to do the same again perhaps once or twice before the job was right. All of this created expensive scrap and took much longer."

Not only is production able to start more quickly on the compact Xpert 40 press brakes, but the machines are also highly efficient, according to Allsop's production director Lyndon Tyas: "With these inherently fast bending cells, all of the upper and lower tooling is to hand in drawers on the left and right hand sides of the machine and the operator can remain seated when loading them.

"Tool positions are automatically calculated as a part of the program and flashing LEDs on the front of the upper beam instruct the operator where to mount the tool segments.

"The ergonomic configuration means that setting up the machine is rapid, typically 15 minutes for a straightforward part. Accuracy is high - we easily hold ± 0.5 mm, more than good enough for most jobs and we can even halve that tolerance if required."

He also pointed out that there is space to



Examples of cabinets produced by Allsops using panels cut and bent on Bystronic fibre laser and press braking equipment

hold cut blanks on one side of the machine and components that have been bent on the other. Another feature is the ByVision touch-screen control, which can be conveniently positioned to one side at the operator's eye level, or just above it centrally if preferred. 24/7 production no longer needed.

Allsops has been a customer of Bystronic or its acquired companies for more than 20 years and there is little sheet metal processing equipment on the Holmfirth site, apart from a bending line and a punch press, that have not been sourced from this supplier. While thinner gauges of mild steel constitute a majority of the material going through the machines, plate up to 25 mm thick is also cut as well as stainless steel and aluminium up to 30 mm.

Founded in 1959 by Bob Allsop to support a growing manufacturing community in west Yorkshire, the sheet metal design and engineering subcontractor is celebrating its 60th anniversary this year. It operates from 84,000 sq ft premises in Honley, near Holmfirth.

From the start, the company adopted an unwavering focus on quality. Services range from design consultancy through punching, laser cutting, folding, welding, fabrication and powder coating to assembly. Installation of modern and highly efficient production machinery, notably from Bystronic, has a boosted turnover to in excess of £10 million and the company now employs 150 staff.

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The pair of Bystronic Xpert 40 press brake cells in operation at Allsops. Almost all cut sheet metal at the Holmfirth factory is folded

AMADA EG-4010 press brake

The innovative EG-4010 for maximum productivity and ergonomics

The new press brake EG-4010 completes the AMADA portfolio as the first servo-electric powered, ergonomic press brake with the patented AMADA DSP system. It sets standards with regard to speed, convenience, reduced power consumption and intuitive programming.

Low-maintenance electric drive results in high speeds

With the EG-4010, AMADA has now introduced a compact press brake featuring low power consumption and high output with high approach and bending speeds that guarantee short cycle times. The electric drive ensures low maintenance requirements, because oil changes, for example, are not required. The precisely positioned beams ensure precise repetition, 0.001 mm and the utmost level of quality.

The latest generation in controls

As the latest generation of AMADA equipment, the EG-4010 features a network-compatible, user-friendly and

intuitive control system (AMNC 3i) which is able to perform bending tasks in a fast and straightforward manner.

Ergonomic features and durable equipment frame

In response to the high demand for ergonomically designed equipment, the EG-4010 offers numerous features, such as an adjustable work chair, height-adjustable front table and foot rest, as well as a height-adjustable control panel with left or right-side positioning for the utmost operating convenience. Due to its high-stability, the newly designed equipment frame of the EG-4010 also accommodates the processing of a diverse range of sheet metal thicknesses. Its compact construction also enables space-saving placement in small production facilities, thereby increasing productivity.

Optional active angle measurement and Delta-X back gauge

The angle measurement system Bi-J by



AMADA, which is positioned between the lower tools, provides the highest possible accuracy for all materials and thicknesses up to 6 mm. This means that test bending with wasted materials is avoided completely. With up to four sensors, even more sophisticated setup plans can also be implemented.

The Delta-X back gauge enables independent operation of the stop fingers in a process area of +/- 150 mm in X-direction and is equipped with two powered fingers.

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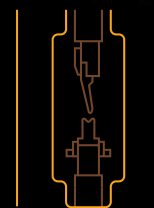
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0-frame



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Better bending through automation

By Neil Osborne, sales director, LVD (UK) Ltd

Modern bending automation addresses the needs of both high-volume production and high-mix, low volume situations. Advancements in automatic tool changing, robot cell technology and software have made automation more practical and cost-effective for bending operations, no matter the size or scope of the workshop.

Reducing manual setups

Automated tool changing press brakes can have a big impact on increasing productivity by reducing manual setups. This is especially true for small batch, high-product-mix environments.

We ask fabricators:

- Are you changing press brake tooling more than six times a day?
- Do your parts require complex or multiple bend stations?
- Are you losing time because of incorrect positioning of tooling sets?
- Are you losing time retrieving tools or searching for tools in use on other machines?
- Is your overall throughput diminished?

If these situations exist, an automated tool changing press brake is worth evaluating.

Automating tool changes

The automated tool changing press brake features an integrated tool storage system. The press brake's dual-purpose backgauge is used to load and unload tools from the tool storage system. Tool changes are performed following an optimised tool change path. A gripper automatically selects and places the tooling required for the job. The machine unloads the previous tool setup and loads the next setup, quickly, precisely and without manual intervention.



Even complex tool changeovers can be completed in a few minutes. Whilst the operator is preparing parts for the next job, the press brake automatically unloads the previous tool setup and loads the next, ready for production. This frees the operator to do other things, such as prepare for the next job or attend to a nearby punch press or laser.

In some press brakes, the tool storage system can be configured to suit individual application requirements. Recent advancements allow for an even greater variety of tools to be made available to the press brake via the integrated tool storage. Having a large capacity of tools housed within the press brake provides the flexibility to handle a wider range of bending jobs, including complex layouts.

In-process quality control

Most press brake manufacturers offer some form of angle measurement technology. This technology offers several advantages: manual test bending and correcting is eliminated as is the need to check parts within a batch run, scrap is reduced and so is operator involvement. Real-time feedback during the bending process helps ensure accuracy, automatically.

One type of in-process adaptive bending system shown employs lasers to monitor and adapt the angle in real time during bending

to achieve +/- 0.3° accuracy. This system does not look at the bend and apply a correction afterwards, so there is no interruption in the bending cycle.

Beware of any adaptive system that significantly increases cycle time. A true real-time angle measurement system provides feedback to the machine control for positioning of the ram to produce an accurate bend without secondary compensation. Systems that do not operate in real time take a measurement of the angle at a ram position above what is required to create the bend. From the measurement taken, the system then calculates the final position to create the accurate bend angle. This all takes time, which significantly slows the cycle and offers little advantage over the traditional trial and error method.

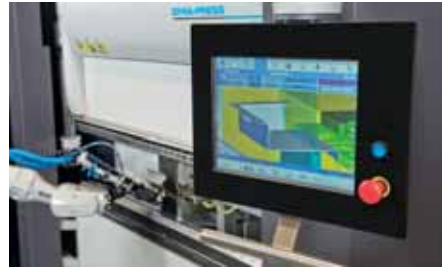
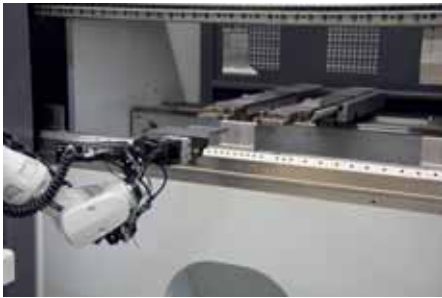
Robotised bending

Electric-drive press brakes are ideal for bending small parts in large volumes at high speeds. This efficiency lowers the cost-per-part.

Coupling an electric press brake with an industrial robot advances this productivity, allowing unmanned operation and the

capacity to handle small, complex parts in varying batch sizes. When producing a large series of small parts, this bending cell can operate unattended for up to eight hours. The bending cell also features a universal gripper that accommodates part sizes from 25 mm x 100 mm up to 300 mm x 400 mm. Because one gripper fits all applications, production is continuous and uninterrupted. Users can make bends on three different sides of a part without regripping. Gripper suction cups are controlled via offline software and activated according to part size.

Today's robotised bending cell is different from the robotic bending systems of the past that integrated a hydraulic press brake to a standard robot arm. These systems required robot teaching and a significant



investment of time for bending setup in order to realise the productivity advantages of automation. They were also usually much less compact than today's bending cells.

Software advancements

Software advancements have cut programming time for the press brake and the robot. Full network connectivity and more intuitive control of the machine also helps make tool setup more efficient. Parts can be programmed offline and 3D-simulation files can be seamlessly transferred to the machine ready for production. This minimises the art to part time. In the case of a bending cell, CAM generation of the bending and robot program can take just 10 minutes with another 10 minutes for setup and first part generation.



Why automate bending?

Whether you're bending small or large parts, small or large quantities, or high-mix parts, advancements in automated bending technology are providing more automation choices suitable for a wider range of applications.

With automation more accessible comes the temptation to over-automate. Beware, doing so can negatively impact your cost per part. Be sure that the ratio of cost of the automation is not more than twice the cost of the stand-alone machine. This keeps the direct cost of the part at an ideal level.

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Durma is the winning force for fabrication

Fabrication machinery from Axe & Status is exclusively imported from the Turkish company Durmazlar, under the trade name Durma. The range includes CNC pressbrake, swing beam guillotines, variable rake guillotines, mechanical shears, fibre laser and CNC plasma machines, as well as a range of plate roll bending machines and profile bending machines.

AD-R & AD-S Series

The all-new range of pressbrakes are perfectly equipped for sensitive bending and energy efficient solutions. Each comes equipped with easy-to-use control units, rigid body frame, perfect design, high efficiency, multiple tool usage solutions and top-level CE safety standards.

With a suitable price range, the AD-R is a leader in its category. It features a high sensitivity, stress relieved steel construction body and long-life Mono Block Frame. It has automatic calibration and first start up with a DURMA designed and copyrighted guiding system as well as ball screw and linear guide integrated perfect back gauge system.

It is durable and has sensitive, bending capable, special hardened top tools. Suitable for segmented tools with special and fast toolholding system it has high accuracy linear scales.

With simple programmable features, the high-speed AD-R Series press brake adds value to your business with low energy consumption, precision bending and maintenance-free structure. This series can be used safely for many years and simplifies the operators workload.

Fast, efficient and modern

AD-S Series press brakes are designed with high technology to increase efficiency on precise part bending. Bending performance is increased using a high-quality European clamping system, which ensures ease-of-use, while the narrow table is designed for a European style toolholder and Z bending.

As a total supplier for sheet metal manufacturing, with almost 60 years of experience, Durma understands and recognises the challenges, requirements and expectations of the industry. It strives to satisfy the ever-higher demands of customers by researching and implementing the latest technologies.



In its three production plants, with a total of 1,500,000 m², 1,000 employees are dedicated to delivering high-quality manufacturing solutions at the best performance to price ratio in the market. From innovations that are developed at its R & D centre to the technical support given by its worldwide distributors, they all have one common mission: to be your preferred choice.

Training, service and support

Training facilities are provided within Axe & Status' own offices, combined with on-site training on a one to one basis with the operator. Close contact by telephone ensures reliability and confidence within the workshop. Refresher training or specific courses are also provided to give maximum flexibility to operator capabilities.

The company's service department is set up to provide a proactive approach in order to eliminate machine and control problems. It offers all its customers' on-site machine inspection, with written reports to highlight potential problems. Planned maintenance schedules can be set up and operated to coincide with customers' production runs, existing maintenance schedules and plant shutdowns. Axe & Status also offers an excellent reactive service to cope with any occasional breakdown situation, with fast turnaround times to get machinery up and running as quickly as possible.

Effective maintenance is the key to

keeping machinery working hard and minimising downtime.

Service contracts are offered on an annual basis, with the choice of one or two visits per year. Additional benefits include a 15 percent discount on all electrical or mechanical parts, reduced hourly rates for engineers visits as well as unlimited telephone support.

The business was established in 1970, then trading as Axe Machine Tools Ltd and Status Sheet Metal Machinery Ltd. These two companies, specialising in metal cutting machine tools and fabricating machinery, were combined in 1979, trading as Axe & Status.

The principles upon which the business was formed back in 1970 still apply, in that the company's objectives are to supply acceptable quality and reliability in all of its products at a competitive price. This enables customers to remain competitive and maintain low hourly charging rates, a prime feature in the machine specification for final product selection.

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Maximise your press brake machine

With advancements in laser technology within the sheet metal industry, many companies are replacing their punch presses with lasers. Although lasers are great tools for cutting 2-dimensional profiles in a flat sheets, fabrication companies are then left with the question of how to produce 3-dimensional forms in their components. Fortunately, it is possible to produce forming tools for a press brake, often with fewer limitations than a punch press.

There are many forming applications available for your press brake, including the following examples:

Louvers

Press brake louvre specials have fewer limitations than their punch press equivalent in terms of size and required forming force. There is the potential to produce louvre forms up to a metre in length in your press brake.

Hinges

Press brake hinge specials can be used to reduce the need for costly hinge hardware



along with secondary operations such as welding hinges to components. Panels can be fabricated on the press brake with their own integrated hinges.

Brake Partner

Wilson Tool's Brake Partner™ adapters can be used to fit punch press specials directly onto a press brake. Adapters can allow fabricators that have migrated away from a punch press to adapt their existing forming tools or new forming tools to their press brake. In addition, companies who still have a punch press can use Brake Partner adapters to improve the flexibility of their workshop, by producing forms on whichever machine has the required capacity.



These are just examples of the many different types of 3-dimensional form that can be produced on a press brake. Please contact Wilson Tool for help with any forming operations on a press brake.

Wilson Tool provides the most comprehensive line of tooling systems and accessories for the additive, tableting, stamping, bending and punching industries. As the world's largest and only tooling provider to manufacture tooling solutions for these five industries.

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The precise geometry of 3D cutting?

Pipes for industrial and residential flue ducts are made using machines by Kollmorgen direct drive motors

The production of automation systems for sheet metal forming, for sectors such as air conditioning, flue ducts and the automotive industry, is the core business of TTEngineering. Located in Lomazzo, near Como, in a modern building of more than 2,000 m², the company has also gained expertise in the cosmetics, medical, packaging and assembly sectors.

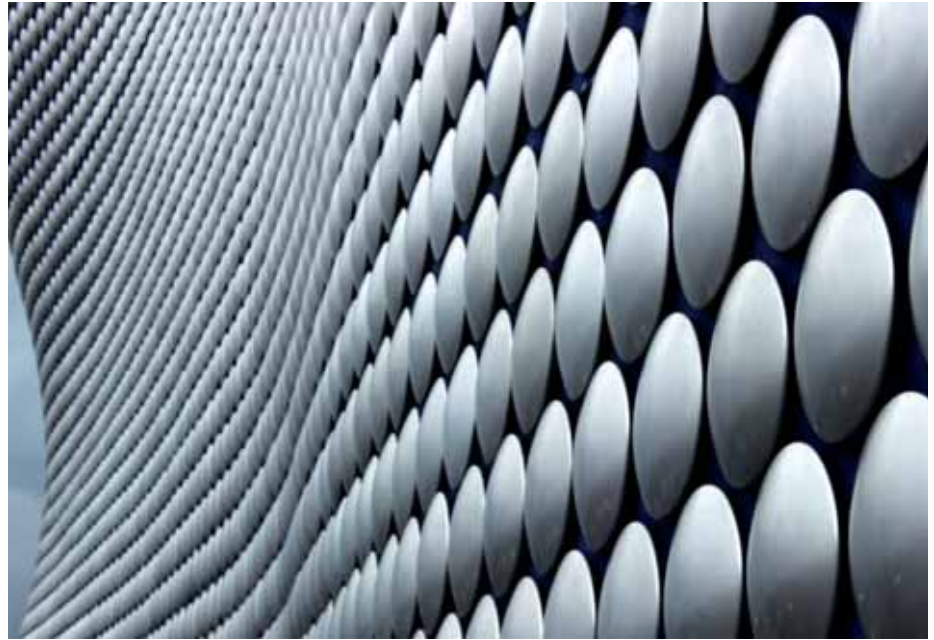
More than 1,500 systems running in factories all over the world and exports accounting for well over 90 percent of total turnover, are sources of pride for the company whose service department is able to respond precisely, quickly and punctually, even remotely.

To meet the ever more pressing needs of the market in terms of delivery time and performance, TTEngineering has concentrated on a design that can satisfy the performance requirements of acceleration, precision, productivity and flexibility. During a meeting in Parma at the SPS trade fair, the Como-based company set out its requirements to Kollmorgen. The motion control specialists proposed direct drive technology as the optimal solution for doing away with the complex mechanical transmission that involves drive belts and gear motors. In doing so, TTEngineering embraced the concept of a direct drive motor.

"We see two big advantages with Kollmorgen: it is a global brand that offers design consultancy and after-sales services of a high standard," explains Massimiliano Crespi, who was head of engineering & production at the time of this particular project and is now managing director at TTEngineering. He adds: "The approach of the Kollmorgen staff during the design phase was outstanding. The final tests provided the anticipated responses and allowed us to launch the TOP600 onto the market little more than a year later."

TOP600 machine for pipes for flue ducts

The TOP600 is a machine for the 3D cutting of pipes intended for use as flue ducts for all sectors, from industrial to residential, produced with a range of materials. The TOP600 is a Siemens CNC 5 interpolated axis laser cutting cell that is suitable for



machining pipes with a maximum length of 1,500 mm, a diameter of between 3" and 30" and thicknesses of 0.4 to 2 mm, made from steel, iron, or copper. The patented pipe clamping system has been created with a CNC self-centring spindle. This machine is aimed at companies operating in the HVAC and chimney pipes sectors. Depending on the combination of materials, thickness, and laser power, it is possible to cut at variable speeds of up to 20 m/min.

It is a modular machine which can be used by one operator who manually loads/unloads the pieces or in fully automatic mode, integrated into an automated line where a robot loads/unloads the pieces. At the same time as updating the direct drive equipment, with a torque motor on the rotation spindle, new software has been developed that allows for cutting with bevelling. TTE has its own CAD/CAM platform and sophisticated cutting management software, with predictive mathematics to compensate for out of roundness errors: the machine provides perfect cuts even for pieces that are slightly out of gauge.

There are two versions available, the TOP600 Plasma and the TOP600 Laser, depending on the cutting technology used. The two machines are identical in terms of their configuration. The only changes are to

the source used and, therefore, the type of cutting head used.

KBM Frameless Motors for modern direct drive technology

As an alternative to the technology that has been used in the past, namely precision gear motors and belt drives, Kollmorgen recommended a KBM™ series direct drive motor to TTEngineering that can offer greater flexibility and a range of different speeds so the machine can be adaptable and produce pipes with differing diameters.

The design of the machine also benefits, becoming flexible and compact, ensuring stable performance over time, remaining constant even with a high number of cycles, no downgrade.

The KBM series has been developed to be integrated directly into the machine, using its own bearings to support the rotor; it provides a high level of performance while allowing for a smaller size. There is a wide range of standard motors, 14 sizes with varying lengths, different configurations and options are available depending on the requirement and changes to the shared design can be made quickly and cost-effectively.

Massimiliano Crespi says: "The performance offered by the Kollmorgen KBM series motor is so high that they even

prompted us to redesign part of the frame and the cutting automation. The use of the motor also enabled TTEngineering to patent an automated pipe clamping system.”

The profitable collaboration with Kollmorgen continues with a new objective: TTEngineering is working on a product which will replace mechanical cutting with a high-tech laser and Kollmorgen linear motors will again be of great assistance in this case.

Kollmorgen is a leading provider of integrated automation and drive systems along with corresponding components for machine builders all over the world. With more than 70 years of motion control design, application experience and profound knowledge of constructing standard and special solutions, Kollmorgen supplies solutions time and again that stand out in terms of performance, quality, reliability, and ease-of-use. As a result, customers can



achieve a market advantage which is beyond question.

The company offers short lead-times by manufacturing and production in-region for region. It has a global supply chain and low-cost manufacturing around the globe to drive cost-effectiveness, continuity and timeliness.

Its engineering centres of excellence and customer service in all major regions of the world, with application knowledge and

rapid customisation and prototyping, enable close collaboration with its customers.

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New aluminum strip processing line

Henan Tongren Aluminium Co. Ltd, a Chinese manufacturer that specialises in the production of aluminum products, has awarded Tenova with a new contract for a continuous annealing and chemical pretreatment line for processing strip coils for the aluminum market. Tenova is a part of the Techint Group, that specialises in innovative solutions for the metals and mining industries.

The new line will process automotive and aircraft aluminum alloys, family series 2XXX, 5XXX, 6XXX and 7XXX, with a strip width range from 1.000 mm up to 2.650 and thickness range from 0.3 up to 4.5 mm. The envisaged total production for the line is about 100.000 tonnes/year with a process speed of 60 m/min.

It is equipped with double unwinding pay off reels and with a tailor-made stitcher with automatic spray lubrication system. The entry side trimmer is equipped with integrated scrap chopper while the alkali degreasing section is made by a spray tunnel with multistage cascade rinsing section. Entry and exit loopers are horizontal type with double winch motorisation.

The chemical process starts with an acid tunnel etching section, followed by a no-rinse spray titanium zirconium passivation and a squeegee roll coater oxylane product for automotive adhesive bonding application.

The exit side includes a tension leveller, a pre-aging furnace, an automatic surface inspection system, a dry lube smelter and a rotary shear. The thermal portion is supplied by EBNER Industrieofenbau GmbH, one of the leading suppliers in floating furnaces for the aluminium heat treatment processing line plant, consolidating the partnership between the two companies in aluminum lines and increasing the top record reference list worldwide. The line is expected to start its production at the beginning of 2021.

Nicola Cavero, Tenova senior vice president for Italmimpianti & strip processing, says: “This new order confirms Tenova as a reliable partner in processing lines for



aluminum thanks to our continuous effort to improve the design and the manufacture of its supply to maximise line availability. We were chosen among several companies and are very proud of this new contract that consolidates our leadership in this field.”

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BeltFLEX enables quick and ergonomic sorting of finished parts

The high speed of modern laser cutting systems call for productivity enhancing and, at the same time, user-friendly systems for the manual sorting of prefabricated parts. With BeltFLEX, material flow expert Remmert offers the fitting solution in its portfolio. With the integrated unloading option, finished parts can be sorted easily, quickly and in an ergonomic body posture. The component of the Remmert modular system convinces through its simple integration into existing layouts and can be used intuitively. In combination with other systems of the FLEX portfolio, ideal solutions for an agile material flow can be realised.

BeltFLEX is a conveyor belt from which the operator can manually sort finished parts. The belt height is adjustable between 765 and 875 mm, which enables back-friendly working. BeltFLEX promotes ergonomic posture on the one hand and fast manual sorting on the other. An even belt advance cycle ensures a faster unloading process than other variants of manual sorting. BeltFLEX is available in the formats 3015 and 4020 and can transport sheets up to 12 mm thickness. The permissible total weight of the finished parts to be transported is 1,600 kg. By using BeltFLEX, the material flow is significantly improved and users achieve measurable increases in productivity.

As a module of the FLEX family, BeltFLEX supports agile material flow. The modules of the Remmert FLEX family do not only combine simple integration into existing systems: clean industrial design, form and function merge convincingly. For example, the integrated personal protection concept ensures maximum safety at work as LED lights visualise the device status, faults and hazardous situations. The control of the FLEX components is simple and intuitive. With the aid of self-explanatory and internationally understandable pictograms, the SMART Control system guides the user through the operation.

Frank Baudach, sales manager at



Remmert, says: "The FLEX family is versatile, but all its components were designed with the aim of continuously improving the material flow in the respective area of application. With the LaserFLEX loading and unloading system, for example, the fastest automation solution on the market, laser cutting systems are optimally utilised."

In combination with the BASIC Tower storage solution, used as a buffer for raw materials and finished parts, laser cutting systems can be operated day and night, which significantly increases the productivity of a system. By integrating FLEX modules, users can ensure an optimum material flow.

With Remmert, you can always expect the highest amount of economic efficiency and uncompromising high quality from the company and its systems that are all produced in Germany.

Based on a comprehensive analysis of your initial situation and your requirements, the company can mutually define realistic project goals and thus, develop a tailor-made solution for maximum efficiency in storage and manufacture.

Its system solutions have long-life thanks to modular designs. They can be expanded easily at any time and can therefore ensure future investment security. As a specialist for fully automatic storage technology, intelligent logistics software and economic automation solutions for the long goods and

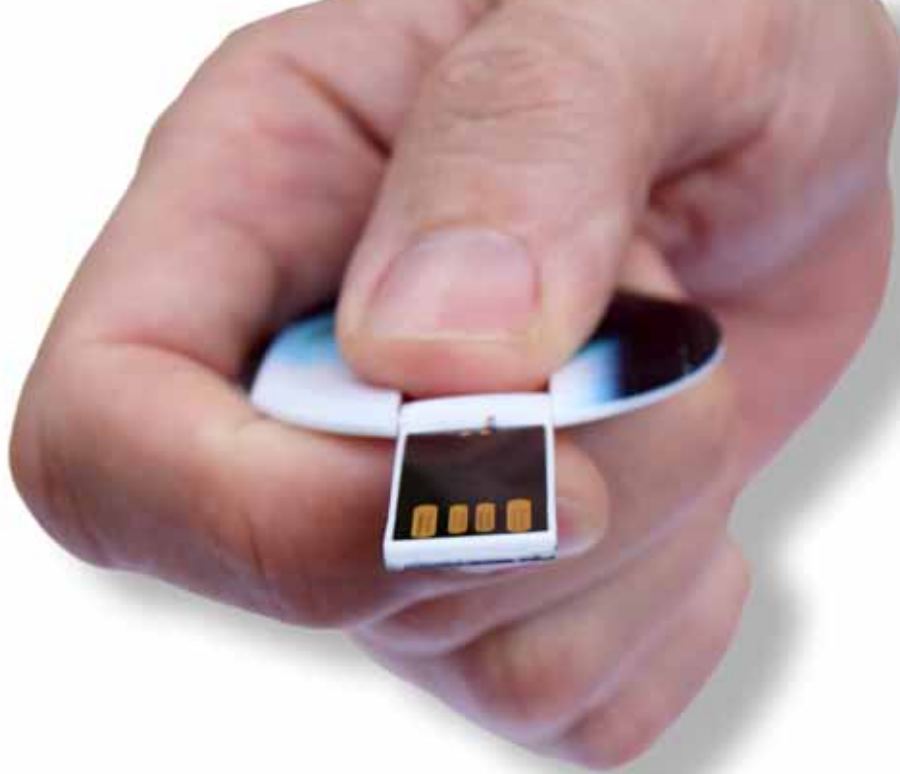
sheet metal sectors, Remmert offers you a one-stop service for best material flow solutions.

From advice on conception and planning to the finished assembly and implementation, Remmert is at your side. Even after secure system integration, the company provides extensive after-sales-service. Space optimised storage, fully automatic material handling and efficient process correlation are the core skills, with which it can optimise your tailor-made storage situation.

To ensure availability and the longest possible life of your systems at all times, Remmert completes maintenance at regular intervals. With its systems customers receive a warranty of twelve months, which can be extended to 24 months. You will also receive an individual maintenance contract if needed.

In order for your storage system to operate smoothly, Remmert delivers all necessary replacement parts as quickly as possible. It supplies these using a global service network, exclusively from notable manufacturers.

Remmert GmbH
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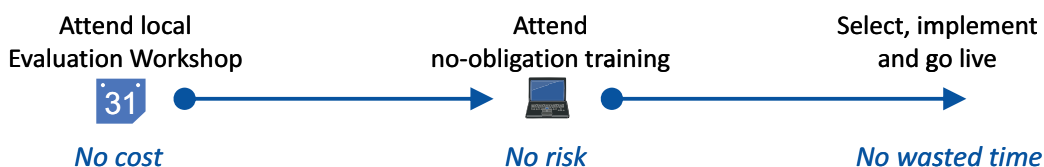
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