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VOLUME 14 | No.1 ISSN 1742 -5778

www.rbpublishing.co.uk

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Published by Roger Barber Publishing
Enterprise House, Foundry Lane, Horsham, West Sussex, RH13 5PX
Tel: 01403 266022 Fax: 0208 916 0033

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

Engineering Subcontractor is a controlled circulation magazine, available free to selected personnel, at the discretion of the publisher. Please complete and fax back the Reader Registration Sheet if you would like to apply for a regular free copy.

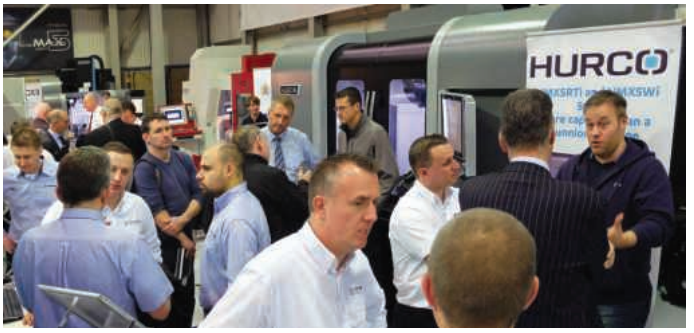
Near record sales for Hurco in 2016 and a good start to next year

At its busy Open House in High Wycombe during December 2016 and in the immediate aftermath, Hurco Europe took orders for 12 vertical machining centres to the value of £800,000. The company welcomed 70 engineers from 50 manufacturing companies from the OEM and subcontracting sectors during the two-day show.

The event cemented a solid start to the current financial year, beginning 1st November, since when over 70 orders have been booked, double the number compared with the same period last year.

Managing director David Waghorn says: "Trading was quiet in the run-up to Brexit, but business has picked up strongly since late summer and it looks set to continue into 2017. Our 2015/16 turnover was just short of £20 million, the fifth successive year it has been very close to that figure.

"We launched our new, entry-level VM5i machining centre in September and sold 10 before our Open House, which helped to boost turnover in both financial years. The proportion of new companies buying Hurco equipment in 2015/16 was just over 40 percent, similar to the last five years, which is the reason we have been able to sustain our business growth."



A further explanation for the near-record level of trading last year was the sale of five German-built Roeders 5-axis machining centres with automation into the UK and Ireland under a sole agency agreement. Virtually all models in the Roeders machining centre range can be equipped with jig grinding at 90,000 rpm. The option is creating considerable interest presently in the motorsport and automotive sectors.

Sales of Hurco's own 5-axis machining centres are also holding up well, with the VMX42SRTi and VMX60SRTi B-axis models with flush rotary table proving most popular, although trunnion-type configurations are preferred for some applications.

Hurco's large, high-value DCX bridge-type machining centres have contributed well to the bottom line. David Waghorn advises that a 5-axis variant of the DCX32 is currently being installed and announced that a DCX62 with 6.2 metre X-axis is now available, built to order. There are over 20 DCX-series machines operational in the UK.

Hurco has been selling machining centres for the whole year with its latest MAX 5 control system, which has proved highly popular. Running the latest WinMAX 10 software, it is ideal for conversational programming of 5-sided and 4th axis rotary cutting cycles, but also handles all of the latest ISNC codes required to run simultaneous 5-axis programs.

Hurco Europe Tel: 01494 442222
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Moving MACH 2018 forward

The MACH exhibition, is set to return to the NEC in Birmingham in April 2018 with a new look and new location

After a hugely successful 2016 edition of the exhibition, which boasted sold-out exhibitor space, a 10 percent increase in visitors on 2014 and over £150 million worth of business attributed to the show, the Manufacturing Technologies Association (MTA), the organiser of the exhibition on behalf of the industry, has officially launched the 2018 edition of the UK's premier manufacturing technologies showcase.

MACH 2018 will take place on the atrium side of the NEC, in Halls 6, 7, 17, 18, 19 and 20. This is the first move of the show since relocating to the NEC when it opened in 1976 and reflects the changing technologies the show covers.

The new halls mean the show will take place in a single uninterrupted space, on one level, making the show easier to navigate for visitors and providing a unique opportunity to showcase the full UK supply chain under one roof.

MTA CEO James Selka, says: "The shift in technology towards a more digitised, automated model of manufacturing is an exciting evolution of the sector, of which MACH is at the forefront. As such, we as owners and organisers have decided to refresh the show and enhance the exhibitor and visitor experience by moving to this new location in 2018."

The new halls also have more entrances, enabling visitor flow to be managed more efficiently and giving all exhibitors a better stream of potential buyers and partners to their stands. The new layout also means a reduced depth from the front to the back of the halls making it easier for visitors to navigate and see the whole show.

As well as the move to new halls, the exhibition will also focus on Industry 4.0 technologies. James Fudge, head of events at the MTA, says: "We understand the importance of reflecting the whole of UK manufacturing within the exhibition and the shift towards greater automation within production. With the application of digital technologies to manufacturing, the theme of interconnectivity will be reflected throughout the show."

Ballots 1, 2 and 3 have now taken place with over 18,000 square metres of space allocated already. Exhibitors have been quick to secure their spots on the floor plans and the amount of space allocated for 2018 is slightly ahead of 2016's for the comparable time period. Full, live floor plans can be found on the MACH 2018 website.

MACH was established more than 100 years ago, by the Manufacturing Technologies Association (MTA). It is the largest manufacturing technologies event in the UK, attracting in the region of 600 exhibitors and more than 25,000 visitors. Taking place from 9th-13th April 2018 at the NEC in Birmingham, the biennial exhibition brings together the latest developments and best innovations. MACH provides manufacturers of all sizes and sectors the chance to network with key clients and prospects as well as gain insight into their needs and future vision for supply chain manufacturing.

For more information visit: **www.machexhibition.com** or contact:

The Manufacturing Technologies Association
Tel: 020 7298 6400
www.mta.org.uk

Fastener Fair Stuttgart 2017

Fastener Fair Stuttgart, the world's leading exhibition for the fastener and fixing industry, will take place from 28–30 March 2017 in Halls 1, 3 and 5 at the Stuttgart Exhibition Grounds in Germany. The new positioning of the halls has increased the available net exhibition space to 20,500 m², enabling a further growth of the exhibition by currently seven percent compared to the previous event. Already 97 percent of the total available stand space has been booked so far.

To date, around 790 companies from 41 countries have secured their stand at the 7th International Exhibition for the Fastener and Fixing Industry. Germany, France, Italy, the Netherlands, Spain and the United Kingdom are the major European exhibitor counties. Asian exhibitors mainly come from Turkey, China, India and Taiwan.

The further growth of Fastener Fair Stuttgart 2017 demonstrates that the industry outlook is currently rather positive. "At the moment, the fastener and fixing industry is influenced by the developments in the areas of automation and digitalisation in construction as well as lightweight engineering in the automotive industry. These topics offer new challenges for manufacturers of fastener and fixing technology which are characterised by increased productivity and quality as well as the joining of a variety of materials", says Liljana Goszdziewski, exhibition director of Fastener Fair Stuttgart, on behalf of the organisers Mack Brooks Exhibitions. "The leading trade exhibition therefore offers the perfect opportunity for visitors to discover the latest solutions and discuss the trends in the industry with other experts", she continues.

The Fastener Fair Stuttgart Exhibition profile covers all areas of the fastener and fixing industry: Industrial fasteners and fixings, construction fixings, assembly and installation systems as well as fastener manufacturing technology. The show targets distributors, suppliers, engineers and other industry professionals and is therefore the meeting place for the whole industry.

The new Fastener Fair Stuttgart Visitor Brochure is now available. It contains important information regarding travel and accommodation, ticket prices and services for visitors. In addition, it includes the latest exhibitor list as well as information regarding the venue. The brochure can be requested via the show website **www.fastenerfair.com/stuttgart** and is available in English/German.

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Starrag provides solutions for aerospace and energy

US manufacturer invests in FFM System

Orizon Aerostructures is building something truly unique in American manufacturing with a multi-million dollar investment in six additional ECOSPEED F2060 high-speed machining centres and an automated 12 pallet shuttle system from the Starrag Group in Switzerland.

This is a manufacturing success story that began when Orizon bought a first ECOSPEED F2060 for its Grove, Oklahoma site in January, 2016. It was clear to Orizon that the performance and flexibility of the ECOSPEED's 30,000 rpm, 120 kW high performance spindle with 6,300 mm (X) 2,500 mm (Y) and 670 mm (Z) is enhanced by the inclusion of the Sprint Z3 parallel kinematic machining head. This uses three parallel linear axes drives mounted radially equispaced in the headstock. The spindle platform is connected to each drive via rigid levers with pivots at each end and a ball joint at the other.

When all three axes move simultaneously, the spindle is moved in a straight line in Z. Synchronised motion of the three Z-axes allows the spindle to follow any path within a spherical cone of +/- 45 deg at a maximum of 90 deg/sec. This unique and patented kinematics outperforms all known conventional 2-axis heads.

The six ECOSPEED F2060 and two-place rail guided pallet shuttle system will be used to produce a range of aluminum structural components at unrivalled levels of effectiveness and efficiency. With the high-speed-spindle of the ECOSPEED, cutting volume of up to 10,000 cm^3/min is achievable. The kinematics of the 5-axis-machining process clearly faster than similar machines with fork heads.

Each ECOSPEED is able to accommodate 5,000 kg payloads, allowing workpieces to be unloaded/loaded while another is being machined. The system will feature two load/unload stations, nine pallet buffer stations and an integrated component cleaning device. The complete system will also have the latest innovations in software control, including preventative maintenance modules, which are part of Starrag Integrated Production System. Additionally, the FMS will accommodate an additional three ECOSPEED F2060 machines.

System installation will begin in early 2017, starting with the second ECOSPEED F2060 complemented by the core FMS workpiece handling/movement technologies. Thereafter, machines will be sequentially added to extend the system for completion by January, 2018. Starrag's role throughout development will include application engineering and the appropriate levels of back up and support to ensure smooth transitions of manufacturing at every stage of the project.

Starrag engineers will work in close partnership with Orizon's team to ensure each machine and every machining operation is fully engineered, commissioned and approved and that the system will continue to consistently perform to the exacting requirements laid down by the American company.

Orizon's ECOSPEED machining centre in Grove, Oklahoma

The partnership agreement between the two companies has effectively seen them work closely together 'from machine foundations up', developing turnkey engineered packages based around time studies, tool selection and part acceptance for a number of workpieces.

"We are very excited to partner with Starrag on this major investment." says Orizon CEO Charlie Newell. "We are building something unique in Grove, Oklahoma unlike any other manufacturing company in the United States. This purchase will allow us to increase our efficiency and productivity fulfilling our goal to always delivery a quality product on time to our customer."

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

Starrag Group
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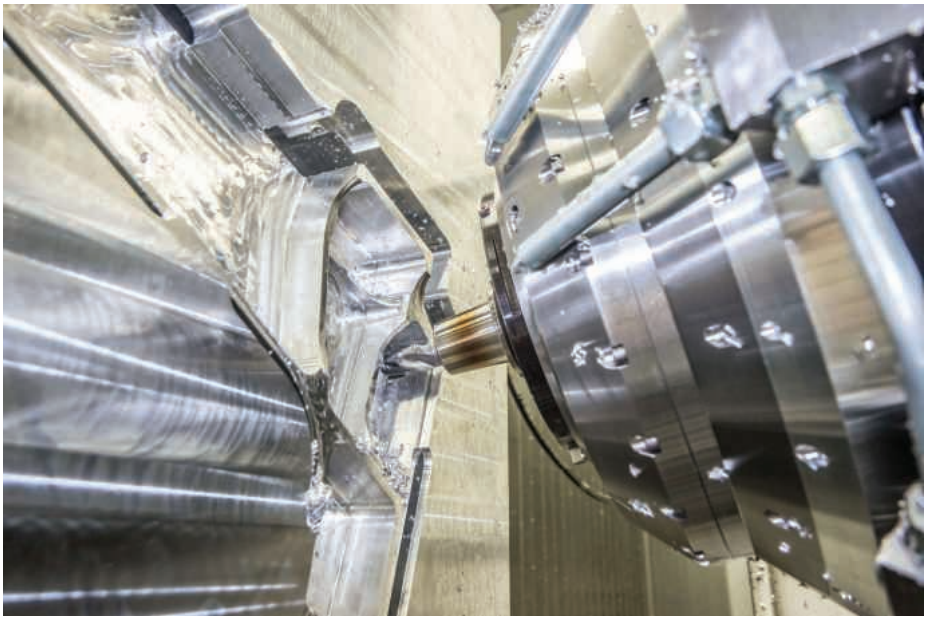

ECOSPEED machining centre with 30,000 rpm, 120 kW, 6,300 mm (X) 2,500 mm (Y) 670 mm (Z)

Engineering sector strong on customer service

Close Brothers Asset Finance

Engineering firms are far more likely to have a customer service team in place when compared to the national average, according to the Close Brothers Business Barometer, a quarterly survey of UK SME owners and senior management across a range of sectors and regions.

When asked the question "Do you have a team in place that is responsible for customer service as part of their job?" 75 percent of SME owners surveyed answered 'yes', compared to the UK average of 63 percent.

"Engineering is a very competitive sector," says Ian Barker, MD of the Engineering division at Close Brothers Asset Finance. "Firms have long understood that customer service can be a key differentiator, and because of that, have devoted sufficient resources to this key function."

The sector also outperformed the national average (71 percent) when business owners were asked to assess their customer service levels. Three out of every four firms surveyed rated their customer service levels as 'good' or 'great', with only 5 percent feeling their customer services levels were 'poor' or 'very poor.' The remaining 21 percent selected 'average'.

When it comes to dealing with enquiries and complaints, face-to-face communication is the most popular method of communicating with customers, along with email, followed by the telephone. Social media is rarely used, with very few companies surveyed selecting it as a customer service channel.

"Despite the advent of new channels of communication, personal interaction is still the favoured way to connect with customers, and I don't see that changing any time soon," continued Ian Barker.

"Clearly, people recognise that some things could always be done better, but overall, these are a strong set of results for SMEs, who understand the importance of delivering high levels of customer service at all times."

All figures, unless otherwise stated, are from a GMI survey conducted in July/August 2016. The survey canvassed the opinion of over 900 SME owners across the UK and across several industries.

Close Brothers Asset Finance offers a range of flexible funding options including hire purchase, leasing and refinancing and is a member of the Close Brothers Group.

Close Brothers is a leading UK merchant banking group providing lending, deposit taking, wealth management services, and securities trading. It employs 2,900 people, principally in the UK. Close Brothers Group plc is listed on the London Stock Exchange and is a member of the FTSE 250.

Close Brothers Asset Finance
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The machines that changed the world of motorsport

Italian machine tool and manufacturing journalist Edoardo Oldrati recently paid a visit to the homes of the Haas F1 Team and Stewart-Haas Racing, in Kannapolis, North Carolina. In both HQs, adjacent to one another on Haas Way, he discovered a common-sense approach to sourcing and developing engines and technology, a determination to ultimately make as many parts as possible in-house, and, of course, workshops full of busy Haas CNC machine tools.

All eyes were on Haas F1 Team when it took its place on the starting grid for the 2016 Formula 1 World Championship, the first American F1 team to do so for 30-years. What many may not have known at the time, and certainly more so on the European side of the Atlantic, is that before entering F1, Haas Automation Inc. founder, Gene Haas had already enjoyed a long and illustrious career as a team owner in NASCAR, the spectacular, fast-and-furious, US-based stock-car series, famous for its wheel-to-wheel racing on mostly oval, banked circuits.

The Stewart-Haas Racing (SHR) NASCAR team and Haas F1 are headquartered in Kannapolis, North Carolina, a city rich in the knowledge, expertise and technologies that go toward designing and building 200+ mph (320 km/h) race machines. SHR is one of the top teams in the NASCAR Sprint Cup championship and can boast a long list of victories and poles. At the time of writing, SHR driver Kevin Harvick is leading this year's championship, with teammate Kurt Busch in 8th place. If Harvick wins, it will be his second championship for the team since he won in 2014.

A team owner moving from NASCAR to F1 is unprecedented. Many can be forgiven for thinking the plan, when it was announced, was overly ambitious by nature, as all motor racing disciplines are infamously unforgiving, none more so than the one that claims to be the sport's pinnacle. However, the US team's impressive debut at the first grand prix of the season, in Melbourne, Australia, silenced many of the skeptics. Haas F1's French driver, Romain Grosjean, came in sixth, winning points on his inaugural outing. To put this extraordinary feat into perspective, it was 2002 that a new Formula 1 team last achieved points in its first race of the year.

Haas F1 is still punching above its weight. However, "We must remember that we're débutants," warns Gunther Steiner, the team principal and the man charged with the ominous responsibility of delivering on Gene Haas' vision. "This is a very technologically challenging championship, so it isn't easy to consistently achieve the same level as other teams that have been racing for years."

To compete at this level, Haas F1 has applied a similar strategy used by Gene Haas to great effect in the world of NASCAR: building relationships with advanced technology partners and buying-in critical parts, as allowed by F1 regulations. The Haas VF-16 uses power units and gearboxes supplied by Ferrari, while the carbon fiber, monocoque chassis was made by Haas F1 Team in partnership with Dallara, another well-known Italian company. Haas F1 Team also makes plenty of its own parts, machined in-house.

"In our workshop we make racetrack equipment and parts for the wind tunnel tests," explains Gunther Steiner. "In the future, however, we want to increase the number of components we make, perhaps even becoming a parts supplier to Ferrari!"

This is an ambitious aim, especially considering the complexity of some of the components used in Formula 1 cars. "In production terms we already have an excellent set of machine tools at our disposal, but we need to nurture technicians and operators in order to develop the necessary know-how," says Gunther Steiner. "It takes time."

"We're learning a lot," adds Brad Harris, CNC operations manager at Haas F1. "Developing effective work cycles to make parts for the wind tunnel has been a major challenge, particularly as we're competing with the production departments of other teams, which are already operating to the highest standards."

He explains that the main difficulty lies in identifying the right process to make these parts: "In particular, we're focusing on reducing the number of setups needed, thus increasing production efficiency. Moving forward, we can turn our attention to the more advanced and complex components needed for the racing cars themselves."

While Haas F1 continues to establish itself and build on its solid start, the NASCAR team is setting the benchmark. The NASCAR workshop at Kannapolis is full of Haas CNC vertical machining centers and CNC lathes, including VF-6TRs with trunnion rotary tables, Mini Mills, VF-2s and VF-4s with HRT210 rotary tables.

"Compared with other motor racing championships, NASCAR requires the team to manage a much greater number of cars," explains Stewart-Haas Racing Shop foreman, Todd Frazier. "We have 16 cars for each driver, including specific models for some races, such as Daytona, and new evolutions with greater performance. With four drivers at SHR, this means as many as 64 cars per season."

The cars are under continuous and very rapid development; for this reason output is a steady flow of small batches. Manufacturing technology plays a fundamental role in allowing the evolution process to take place.

"I'm convinced that machine tools and cars evolve hand-in-hand. To make more 'evolved' cars we need better performing machines," explains Todd Frazier. "In particular, we need to implement the ideas

of designers in a shorter timeframe, and this is where Haas machine tools can help, with their versatility, simplicity and reliability."

One of the team's main suppliers is Hendrick Motorsports, located less than 6 miles (10 km) south of SHR (Hendrick is an institution in the NASCAR world, with 30 years of experience and boasting innumerable wins.) With the growth of SHR, the collaboration has transformed into a strong technical partnership, which currently means Hendrick Motorsports supply's the chassis and engines for SHR cars.

The collaboration with Hendrick is a two-way street. For eight hours a day, lines of Haas CNC machining centres create a noise worthy of a NASCAR team. "The first Haas machine arrived in 1996, says Jim Wall, Hendrick Motorsports engine development manager. "Today we have 47!" Hendrick has two main workshops: engine and car production. "Initially, we focused more on engines, but as many other requests for components started to arrive, we achieved a fairly balanced split between engine construction and vehicle production."

To give some sense of the workload, around 900 finished race-engines will leave the Hendrick production plant this year alone, all machined in-house from forgings, destined for the team's own cars, as well as many other cars on the NASCAR grid.

Amazingly, the shops at Hendrick only work a single shift: "So, we need to carry out many processes in a way that doesn't require night-time supervision," says Jim Wall. "For this reason, the reliability that Haas machines guarantee is fundamental. Furthermore, they are user-friendly and highly versatile - characteristics that allow us to process a wide range of parts. It's also important to be able to count on a partner like Haas for support, given their ability to act quickly, and ensure that spare parts are available immediately."

Since Haas Automation's inception in 1983, the company has risen to become one of the largest machine tool builders in the world by total unit volume. The Oxnard, California-based factory employs approximately 1,300 people and exports 60 percent of its annual production to more than 60 countries. There are close to 185,000 Haas CNC machine tools installed around the world, supported by a network of 170 Haas Factory Outlets (HFOs) and nearly 3,000 Haas Technical Education Centres (HTECs). Seven new HTECs have opened in Europe alone since the start of 2016.

Haas Automation's commitment to motor racing will remain a vital part of its business strategy for as long as Gene Haas has his sights set on a championship somewhere in the world. The company's story, including its racing activities is unique and inspires hundreds of thousands of its machine tool customers and users. Now, thanks to the global reach of F1, perhaps millions of young people will better understand the inexorable link between manufacturing technology and the motorsport they enjoy every weekend of the season. F1 team owners of the future as well as aspiring machine shop owners may also remember the name Haas.

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Continued growth at WOSP leads to machine tool investment

WOS Performance began life as a business remanufacturing rotating electrics from mainly Japanese cars to suit more the niche markets of motorsport and classic cars, with company founder Richard Wos claiming to be the first to reverse engineer a modern starter motor, which he used on his own classic car. The success of this unit led to demand from fellow classic car enthusiasts and a focus on quality and service then took the business forward. With the growth in low-cost imports from China, this business struggled to be competitive, so a change of direction was called upon. A range of starter motors, alternators, and dynators (alternators that look like original dynamos) was created and this is now the mainstay of the business.

11 years on, WOS Performance (WOSP) has seen business grow by 30 percent year-on-year, with 2016 looking to push that growth even further, with the first six months showing a 40 percent increase. The WOSP product range has increased from a single product, with sales of 20/30 units per month, to well over a 1,000 variants, with production rising to over 1,000 units per month and customers all over the world.

Applications for its products range from starter motors for 100 year old cars that originally required a starting handle, through classic road cars that require upgraded power supplies to cope with modern traffic and around 40 percent of the products are designed for use in modern OEM vehicles produced by Aston Martin, Renault Sport, Dallara, Cosworth, McLaren and Jaguar among others.

"Up to 12 months ago, we had limited

manual turning and milling capacity and, as our products became more involved, we found we were spending many hours making parts that we should be able to make quicker," says Luke Wos.

Further changes were called for and the decision was taken just over 12 months ago to upgrade the company's in-house machining capacity. This initially involved the purchase of an XYZ SMX 2500 bed mill with the ProtoTRAK control system. With a table size of 1,245 x 228 mm and capacity to machine parts up to 600 kg, it would be capable of machining any parts in the WOSP inventory. The decision to go with the SMX 2500, was influenced by the 3-axis control and standard power drawbar. This was a major step up for WOSP as, while engineering runs through the business, none of its employees are trained machinists.

"When we took delivery of the XYZ SMX 2500 we took one day of training, before that we didn't even know how to switch it on," explains Luke Wos. "Within a very short space of time we were machining anything we wanted to on the machine, if we got stuck we always had XYZ at the end of the phone for back up."

Having quickly familiarised themselves

with the ProtoTRAK control and with the machine operating 90 hours a week, Luke and machining supervisor James Colver took a second day of training in order to hone their programming skills and maximise the potential of the mill and improve productivity. The decision to begin the investment in in-house machining quickly started to pay off with 95 percent of milled work now undertaken in-house. Batch sizes can now be as low as one-off, resulting in stock levels being reduced. The machine is also available for vital R&D work whenever it is required, with the ability to produce prototypes quickly and cost-effectively. When the initial order was placed, Luke Wos envisaged a payback time for the SMX 2500 of three years. With the productivity gains and cost savings that have been realised, this has now been reduced to two years.

Having already experienced the simplicity of the ProtoTRAK control, it was an obvious choice to look at XYZ's SLX range of lathes, with the ProTurn SLX 355 being the machine of choice. The ProtoTRAK SLX control, like its sister SMX control, makes the machining of complex shapes and forms straightforward, so once the lathe arrived WOSP chose to have just a half day of training just to familiarise themselves with the specifics of a turning-based control system. After lunch they were back on the shopfloor producing parts.

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A showcase of excellence from DMG MORI

John Barber reports from JIMTOF 2016 - Tokyo, Japan

JIMTOF 2016, the 28th Japan International Machine Tool fair held in Tokyo, promised to be the biggest and best yet. With a record number of exhibitors and booths, and a new East exhibition hall, the show offered visitors the chance to see the latest advances in machine tool technology. Under the theme ''the future starts here'' the exhibition more than lived up to its billing with a host of exciting new developments and innovations on display.

The show comprised an impressive 5,518 booths and a total exhibition scale of 98,540 m^2. A total of 21 countries were represented across the 11 halls during the six-day event which ran from the 17th to the 22nd November. Exhibitor workshops, daily seminars from keynote speakers and special displays ensured visitors had plenty to enjoy.

DMG MORI had the biggest stand at JIMTOF with an overall area of 2,160 m^2. The global machine tool company continues to innovate and under the theme of ''IoT/Industry 4.0 & DMG MORI Smart Factory'' the company introduced machines equipped with sensors and unveiled a project titled ''Machine Tool 4.0''. This involves a collaboration between DMG MORI and Schaeffler, a German company.

Speaking at the technical press conference, Dr. Masahiko Mori, president of DMG MORI, said: ''We think that there are 310,000 potential machine tool users worldwide and we would like to gain access to 50 percent of these. This is why worldwide exhibitions like JIMTOF are so important so we can make contact with them.

''This year I am very confident that our marketing team has created an impressive booth. The DMG MORI stand is the biggest stand at JIMTOF and our focus is on Industrie 4.0 and smart factory. Exhibitions are festivals. We will show the future to visitors.''

On the DMG MORI booth, more than 20 technology cycles were demonstrated. These cycles, which enhance the productivity of machine tools, are new solutions that the company offers. They comprise four key integrated elements: machine tools; open innovation for cutting tools and peripherals; embedded software; Human Machine Interface (HMI).

The company presented seven new machine models in total at the show including world premieres such as a new concept vertical machining centre, the CMX 1100 V. The CMX V series of machines are solution based machines to respond to ever-diversifying customer needs. The series offers a total of 290 standard options of every DMG MORI vertical machining centre, making it possible for customers to build up their own customised machines according to their needs. The CMX V Series contributes to boosting customers' productivity with its high versatility to handle varieties of workpieces in various fields.

The CMX series comes as standard with a high-performance spindle with a maximum speed of 12,000 min-1 to handle a wide range of machining. The spindle employs an enhanced labyrinth structure, taking into consideration an intensive use of high-pressure coolant. The structure prevents coolant from entering the spindle

to improve the spindle durability. Furthermore, the CMX achieves high-clamping force by use of the lever mechanism. The CMX series, with a space-saving body, is designed aiming for high workability and maintainability The CMX 1100 V has a wide door opening of 1,151 mm which allows for smooth setups such as fixture adjustments. The large door window ensures outstanding visibility.

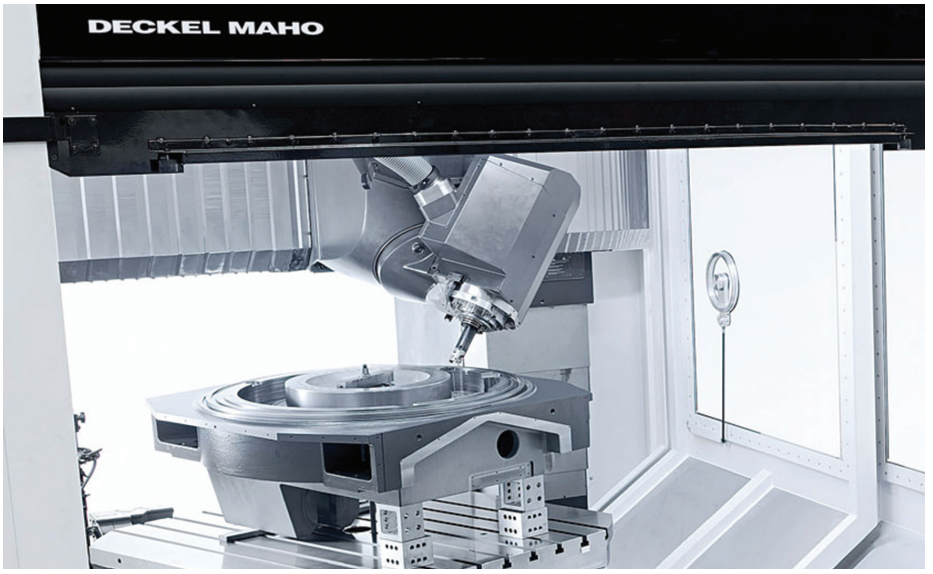
Thanks to the ease-of-maintenance of every unit, the CMX V series is capable of performing at its best throughout the operation and greatly contributes to improving customers productivity.

Another highlight on the DMG MORI booth were the automation systems. The systems, in which DMG MORI's machine tools are combined with robots of FANUC and NACHI, demonstrate the company's commitment to partnerships which enhance both the customers experience and their productivity.

Dr. Masahiko Mori said: ''The relationship between DMG MORI and FANUC is very strong. It is an advantage to both of us to work together. We can add added value to our customers. Together with our partners we produce the best solutions.''

Also, making its debut at JIMTOF was the DMU 210 P 2nd Generation a large 5-axis machine. The machine, equipped with the machining ability equivalent to four portal-type machines, is the largest among DMG MORI's machines that have ever been displayed. Thanks to a revised machining structure and revised cooling measures, the second-generation portal series from DMG MORI has gained even more where accuracy is concerned. The revised structure combined with the innovative cooling concept result in significantly higher precision and an impressive long-term accuracy. In addition, the modular concept for all aspects of the new portal machine guarantees user-specific configuration and therefore also maximum efficiency in day-to-day production.

The DMU 210 P 2nd Generation enables entry into the new world of portal machines from DMG MORI. From just a glance at its outward appearance, you notice the new joint design with which the machine tool manufacturer has underscored its commitment to high quality. This ensures perfect ergonomic working conditions, thanks to excellent accessibility. This is further promoted by the uniform CELOS user interface, with which its unique multi-touch screen and app-based structure



is as simple to use as a smartphone. As a result, users benefit from considerably shorter setup times and 50 percent less effort for calculating technical values and searching for important information.

Industry 4.0 requires the integration of all systems with the machine and the exchange of digital information. CELOS allows users to do just this by fully integrating machines into higher-level structures. Users can integrate their entire organisation and CELOS can control the entire production and manufacturing process, creating and managing orders, and assigning them to machines. At JIMTOF DMG MORI demonstrated how added value such as the monitoring of operation status, predictive maintenance, and quality improvement is newly produced by connecting a machine tool, equipped with sensors, to the network as one of Internet of Things (IoT).

The impressive DMG MORI booth had hundreds of visitors each day and they were treated to live demonstrations, tours and time with technical experts to answer any questions. The company has always maintained a clear focus on its customers and to provide them with the best possible service and quality solutions. Dr. Masahiko Mori said: ''It is our duty to produce precise and high quality machines for our customers. Our customers come to us for the whole solution.''

DMG MORI enters 2017 in confident mood. With its ever-evolving range of machines, commitment to excellence and a reputation for innovation, its customers have plenty to look forward to as we enter the new year. The European market in particular is very buoyant.

Dr. Masahiko Mori said: ''Our machine tool business worldwide is very stable. 50 percent of our order intake comes from Europe and the situation is very positive. Customers are happy to purchase machine tools.

''The productivity in our plants is improving rapidly. Our production personnel are getting more and more efficient and as a result some sites have closed. We now have 14 plants worldwide and estimate we will produce 11,000 machines next year.''

DMG MORI is committed to remaining at the forefront of technological advances. In a more digitised age, it is clear it will have to consistently adapt to new technology and embrace new concepts. Exhibition such as JIMTOF represent the perfect opportunity to meet with customers and to demonstrate exciting new technological breakthroughs. DMG MORI has never rested on its laurels and is already looking beyond 2017.

Dr. Masahiko Mori said: ''By 2030 I think the picture will be very different. In years to come our customers will use different software and different methods to control machines. The key word for modern production is digitisation.

''In the coming two to three years we will continue to experiment and show the results at exhibitions like JIMTOF.''

At the technical press conference, Dr Masahiko Mori also confirmed DMG MORI will continue its sponsorship of Porsche for the next two years and, when questioned about the company's upcoming developments, he left a tantalising glimpse into its future plans.

Dr. Masahiko Mori concluded: ''At the next JIMTOF I hope to show the first stage of Artificial Intelligence (AI).''

continued/....

Tokyo Global Headquarters

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DMG MORI's Global Headquarters are located in the heart of Tokyo. The facility provides an ideal location that supports visitors from around the world and combines a showroom, where state-of-the-art machine tools are displayed, with an advanced office function.

The Global Headquarters also offers demonstrations of the latest machining technology and a varied range of technical school courses run by the most experienced application engineers that are also able to work in a variety of languages.

A wide range of functions are brought together on the individual floors of the four-story building. The first floor is home to the solution centre which features about 30 machine tools all exhibited in the vast space. More than just a showroom, the solution centre also serves as a location for machining demonstrations and joint research with customers into new machining technology.

On the second floor, visitors will find the seminar room where technical briefings and other events are held. Here specialists in each field are invited as lecturers, with seminars about industry trends and the latest technology held in the second-floor learning room, which has a capacity for over 200 people. University professors and other external lecturers are invited to speak on subjects including aerospace, energy and laser machining. In the training rooms, adjacent to the seminar room, teaching courses on 5-axis machining and other subjects are offered to allow customers to learn state-of-the-art machining technology.

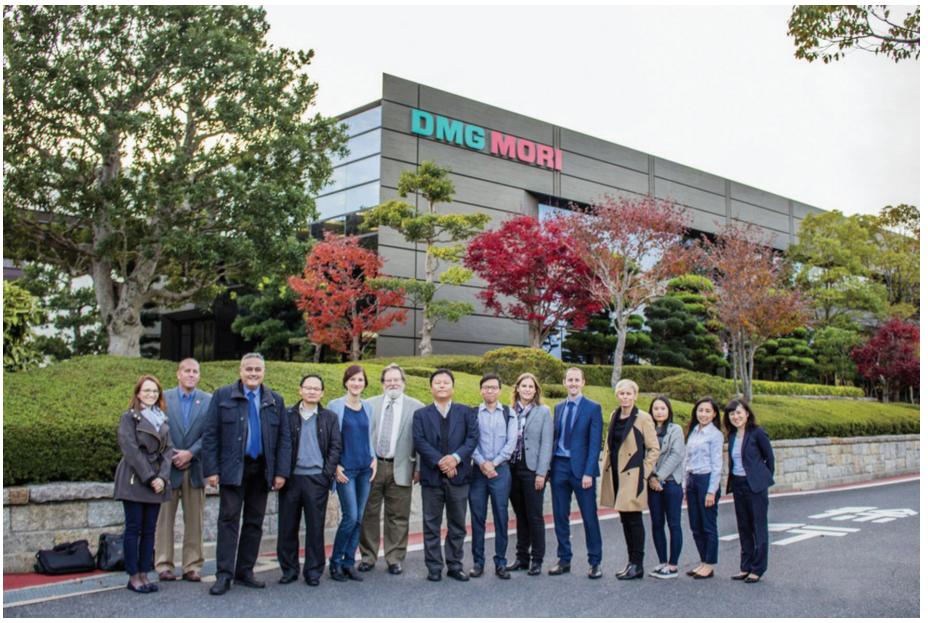
Floors three and four are the office floors. The aim is to provide an environment where technicians and sales engineers, who have come together from countries across the world, can work comfortably. The floors are fitted out with many meeting rooms and a stylish cafeteria. Key to this space is the permanently operational service centre. It is here that staff deal with customer enquiries. The personnel all have a good knowledge of the machines and arrange for any repairs to be undertaken or parts to be delivered. Tetsuo Komuro, executive officer at DMG MORI, says: Before delivery and after delivery we want to ensure great service. In Japan, we have staff working on the 24-hour hotline to provide excellent service.

Of course, it is the technology itself that takes pride of place in the facility. What makes DMG MORI machines special is an array of cutting-edge technologies that maximise accuracy and productivity. These are all innovative technologies that visitors to the showroom should not miss and visitors do indeed visit regularly from far and wide. DMG MORI president, Dr Masahiko Mori, says: ''A lot of customers visit us in Japan from Korea and Thailand every day.'' The location is certainly convenient being just ten minutes from Tokyo station by train and with very good access to both Haneda and Narita international airports. Tetsuo Komuro adds: ''Our location makes it easier for both our domestic and international visitors.''

The solution centre is divided into dedicated sections for each technology. Specialist areas include: 5-axis machining area, laser and ultrasonic area, multi-axis machining area, milling area, turning area. There is a total of 12 turning centres, 12 machining centres, three laser machines, one ultrasonic machine and two tool presetter machines showcased. The showroom has a total space of 1,350 m^2 and the facility itself has a total site area of 3,570 m^2. A total of 140 employees work on site.

Interestingly, an Open House is also held at the premises during the week of the JIMTOF exhibition. This enables visitors to see the latest models that are not displayed at the exhibition and provides an opportunity to see live demonstrations. A free shuttle bus service between the JIMTOF exhibition halls and the DMG MORI headquarters ensure visitors get the best possible experience. DMG MORI's commitment to green initiatives is underlined by its Tokyo facility. By using LED lighting and energy-saving equipment, such

as motion detectors and high-performance heat-reflecting glass throughout the building, its global headquarters achieves a reduction in power consumption of around 50 percent compared to conventional buildings.



Iga Campus

DMG MORI's biggest production site, the Iga Campus, boasts the largest floor space in the machine tool industry in Japan. This campus functions as the company's total production base for state-of-the-art manufacturing, development, service and education. The site provides high quality machines with cutting-edge production technologies. It is an all-round production site which supports manufacturing. The facility was built in 1970 and the campus is vast with a total area of approximately 578,000 m^2 with cars being the main means of campus transportation due to the large scale of the site. It takes roughly one and a half days if you were to walk around the entire area of the DMG MORI Iga campus.

At the campus about 250 units are produced each month which contributes to the company's yearly worldwide production capacity of between 10,000 and 15,000 machines a year. Dr. Masahiko Mori says: ''The productivity in our plants is improving rapidly. Our production personnel are getting more and more efficient and as a result some sites have now closed and we now have 14 plants worldwide. We estimate that we will produce 11,000 machines in 2017.''

The campus consists of a total of three assembly plants and one machining plant. There are also plants on site for bed/column precise processing, spindle, ball screw, casting, heat treatment and sheet metal. The main assembly plant at Iga campus is focussed mainly on the assembly of machine tools. The plant has reduced assembly lead time by employing cell production systems for the first time in the industry and taking on the takt production system. The line production systems, with process segmentation employed for unit assembly, also contributes to a shorter lead time. The assembly status is collectively controlled through network.

The second assembly plant on-site started operation in July 2012. The plant engages in assembly of high-efficiency integrated mill centres such as the NTX series and NT series. The third assembly plant first started operating in July 2004. The plant, that features a large crane inside, is dedicated to the assembly of large machines including an integrated mill turn centre NT series, a horizontal machining centre NHX 1000 and the 5-axis horizontal machining centres. The dual shutter at this plant keeps the internal air temperature constant even when the shutter is open for a delivery track to come in and out.

Utilising cutting-edge large 5-axis machines and many multi-axis machines, DMG MORI's machining plant at Iga campus boosts productivity per unit area through process integration. Here machines such as the DMC 340 FD and the DMU 210 P are assembled. The DMC 340 FD is a super-large 5-axis machine that is equipped with a turning table that has a max turning diameter of 3,400 mm. The machine is capable of high-efficiency and high-precision machining of large components such as a bed and a column. A super large 5-axis machine typically takes four weeks to be installed.

Scraping is a skilled process in which a worker shaves away the sliding surface of castings or resins by using a hand tool. With the DMU 210 P machine, some 500 hours of scraping ensures high-accuracy machining with a volumetric accuracy of less than 35 MICRONS and a linear axis position accuracy of less than four MICRONS. In the DMG MORI campus, skilled technicians with more than three years of experience take a long time to conduct scraping and measuring carefully. These skilled workers are distinguished by the red helmets they wear that symbolise their skills gained over three or more years in scraping.

DMG MORI believes in investing in its staff. If the staff are of the highest standard then so are the machines. Staff are trained to achieve certified skilled worker creditations. The Iga campus is also home to around 250 designers in the development centre. It is here they are creating ingenious machine tools every day.

It is clear that with DMG MORI's cutting-edge technology, combined with world class facilities and a skilled workforce, the future is bright for the company and its customers. Dr. Masahiko Mori concludes: ''Our ultimate goal is to become the number one machine tool company and the best solution provider for our customers.''

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True precision

A continued investment in both people and machines is turning Truturn Precision Engineering into the subcontractor to watch in the South West.

Bob Wilkins, general manager at Truturn Precision Engineering, says: "We've grown from very humble beginnings, and we've a strong strategy going forward."

Bob Wilkins is confident about the Truturn business, in part because he has overseen significant investment in recent years that has laid the groundwork for future growth.

The company, which is based in Stroud, Gloucestershire, dates from 1985 and has capabilities in milling, turning, fabrication and electrical mechanical assembly work, employing 35 staff with 18 machinists on the shopfloor.

From being, originally, a turning business which predominantly serviced the local engineering and manufacturing community, Truturn now has major footholds in the oil and gas, nuclear, food processing and general subcontracting sectors, much of it down to a commitment to cultural change and investment which continues to pay off. In fact, circa 30 percent of the business is export-focused with Europe, the Far East, Canada and the United States being major markets.

Bob Wilkins says: "We decided three years ago, that the culture of the business needed to change. We wanted to bring in some automotive skills and better management into the business, along with more training and accreditations. Essentially, we wanted to professionalise ourselves."

Bob Wilkins has been as good as his word, with the Investors in People GOLD accreditation being quickly followed by ISO 9001, the fit for nuclear programme, and health and safety accreditations. The company is also currently working towards its ISO 14001 environmental accreditation.

Bob Wilkins explains: "I'm very proud of what we've done with ISO 9001 in particular because, in the last three years, we've had zero non-conformities, which is a great achievement for our quality manager who was one of my first hires into the business."

The fit for nuclear programme has also been important. Bob Wilkins says: "It modernises your business and gets you ready to take on nuclear work. It was quite a challenge for us, particularly in terms of the training investment, but we've got work out of it, not least with Magnox.

"We found with Mazak that they didn't just try to sell us machines, they actually looked at the whole business and the sort of work we were doing before making any recommendations. They've worked with us, developing staff and our machining processes, which has enabled us to grow and move into new sectors."

New machinery has been central to the transformation and Truturn's decision to invest in an INTEGREX j-300 was a key turning point.

Bob Wilkins says: "We knew that if we didn't invest in new machines, we weren't going to grow, not least because our customers were looking for us to take cost out of our processes and pass on the savings to them. I would say it was a culture shock for us when we started with it, but it has proved its worth and I would estimate that the INTEGREX j-300 has taken about 15-20 percent of our costs out of the products. In some instances, even more than that.

"Mazak helped us develop the full potential of the machine which, in all honesty, we probably didn't fully understand when we first accepted it into the machine shop."

The machine has had a positive effect on morale. Bob Wilkins continues: "I have three guys on there who know the j-300 inside out, they've been on the training courses and developed their own skills which is very positive for them. I also have one of our

apprentices on there a lot and he loves it. MAZATROL was a learning curve for them, but now that they've got it they find it very beneficial."

The INTEGREX j-300 was quickly followed by QUICK TURN NEXUS 250M. Bob Wilkins enthuses: "That machine has been a revelation for us, particularly in terms of us being able to put development and prototype work on there. We've completed a wide variety of jobs on it, from tube through to complex blocks, but the key point is that we no longer have to complete a secondary milling operation, which means we've cut set-up times by 30-40 percent."

For Bob Wilkins, the aftersales service he has received from Mazak has been crucial, as he explains: "The service engineers in particular have been very good. They've come along and educated and trained our guys which means that we can do a lot of the more basic maintenance jobs very quickly on our own. Mazak also helped us from a technical standpoint, taking drawings and turning them into finished components. The level of support has been brilliant."

Going forward, Bob Wilkins says the future for Truturn lies in 5-axis machining and potentially a specialist milling machine.

Bob Wilkins concludes: "The focus for us is 5-axis now. We'll need some support from Mazak to get there, but that is where we want to go."

A video case study on the cooperation between Truturn Precision Engineering and Yamazaki Mazak can be viewed at:
www.youtube.com/watch?v=AUxwmwyGgek

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Empire Manufacturing: Starting strong with Star GB

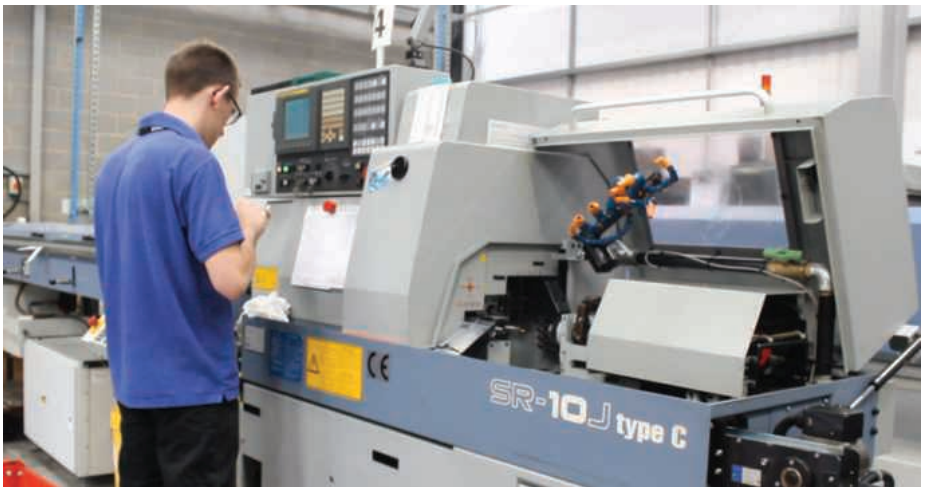
Starting out in the engineering industry can be a daunting prospect. Launching your own business takes courage, wherewithal, and a strong will, while staying afloat through financial worries can be difficult in the calmest of times. However, it can be a blessing in disguise and managing to push through trying times can give a huge confidence boost to a young business. Hertfordshire-based subcontract machine shop Empire Manufacturing knows this better than most, having faced down a huge financial roadblock just months after its foundation.

"I started off working for my dad's manufacturing company," explains Empire MD Stuart Wade. "Around 2007, the business had grown to a point where we found ourselves having to putting a lot of work out to other companies, so we decided to take a different approach and started a new separate company to take on the extra work.

"We started Empire in 2008 and invested up front in a lot of machinery, including three Star GB sliding head lathes, anticipating a big influx of work. That's exactly when the financial crisis hit."

Even with the overflow work coming in from his father's company, Empire was suddenly in a sticky situation. Businesses across the UK were closing down left and right and Empire was left with three new sliding head lathes that needed to pay for themselves and justify the investment.

"It was touch and go for a while, but we continued to see work coming in," continues Stuart Wade. "The team at Star GB gave us a lot of support in the beginning.



"When we initially sat down with them, we had two lists of machines: the ones we really wanted, and the ones we thought we'd have to settle for because they were more affordable. Star's Bob Hunt basically said they'd work with us to get the ones we really wanted and said goodbye to the backup list, setting us up for a great start.
I think seeing the Star name in our plant list gave customers confidence in our products."

Empire's starting line-up consisted of the small diameter SR-10J, the highly capable SR-20RIII and the Star flagship SR-32J. This array of machines gave the company an impressive range of sliding head capability and capacity, allowing it to take on practically any precision turning work. Coupled with a proactive attitude and a considerable skill base, this offering made Empire a force to be reckoned with, winning it numerous customers and the respect of the market.

Star GB managing director Stephen Totty counts Empire Manufacturing among one of the company's longest-standing customers.

"I do admire the tenacity Stuart and the team have showed over the years. We've worked closely with them to help them get the best out of their machines, but ultimately it's a testament to their attitude and willingness to take risks that they made it through the first few tough years. Very few others would have pushed on in their position and you have to applaud that."

The factory has since vastly expanded its plant to include vertical milling machines and various other machinery, including the much newer Star SW-20 sliding head lathe, which boasts both a Z3 and X3 axis, allowing it to function like a turreted machine. This updated functionality has enabled Empire to revisit jobs it had previously declined and complete them with ease, even shaving 30 percent off the estimated cycle times, inclusive of surface finishing and deburring. This adds yet more strings to Empire's manufacturing bow and enables it to be truly competitive.

After nine years of near-constant use, Empire's original machines are still hard at work and performing as well as ever. The manufacturing array has served the company well, allowing the company to maintain high standards and encouraging growth in the face of adversity. Stuart Wade concludes: "It was daunting at first, trying to get started in such an uncertain climate, but we pushed through and since then we've gone from strength to strength."

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Bar magazine upgrade increases productivity

Italian manufacturer, IEMCA has significantly improved the performance of its popular KID 80 short bar magazine to keep pace with the higher functionality of modern CNC turning centres. Availability in the UK and Ireland is through sole agent, 1st Machine Tool Accessories.

The magazine is suitable for feeding stock between 5 and 80 mm in diameter and from 250 to 1,615 mm long. It integrates with fixed or sliding head CNC turning machines and is also suitable for feeding cam-operated lathes. Pre-existing attributes are simplicity of use, precise mechanical bar location and no compressed air connections. It is fast in operation, ideal for short to medium batch runs.

A notable design improvement avoids the need for the bar pusher to move during component transfer between the main and sub spindles. Most short magazines have to check the position of the material in the spindle during transfer, so the lathe has to decelerate the spindle, increasing non-cutting time. Productivity is therefore higher with the KID 80 IV during single-hit machining of components requiring two operations, one at each end.

A further innovation is the ability to load a new bar while the last part is being machined, reducing changeover time, and it is possible to feed into position without a bar stop. A new quick-change connection system eliminates the need to use tools when changing the bar pusher, reducing setup times even further. Other new features of the KID 80 IV include an increase in rack capacity from 250 kg to 400 kg, greatly extending production output during unattended running. The software in the Siemens control has also been improved and a 7-inch touch screen fitted for ease of setting and operation.

A video showing the new bar magazine in operation can be viewed at: **www.youtube.com/watch?v=Bg8pilz-BdI**

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Upgraded 5-axis machining centres include automation options

The U-630 and U-1530 ranges of 3-,4- and 5-axis vertical machining centres (VMCs) from German manufacturer, Spinner, have been significantly upgraded in response to suggestions from end users. Sole sales and service agent for the UK and Ireland, Whitehouse Machine Tools, explains the improvements.

The U-Advanced Series machines offer larger magazines up to 122 pockets for SK40 / BT40 or HSK63 taper tools, higher speed spindles with maxima of 12,000, 15,000 or 20,000 rpm, longer axis travels, higher coolant pressure to 70 bar, improved chip flow and a swarf conveyor as standard.

CNC options are the most modern versions of Siemens (840D sl 4.x) and Heidenhain (TNC620 / TNC640) controls, both with 15" screen. For operator convenience, the height and angle of the control can be adjusted. Digital drives from the same two manufacturers ensure high precision machining, with linear scales fitted for accurate feedback of axis position.

Despite the longer strokes, now 630 x 530 x 465 mm for the U-630 and 1,530 x 530 x 465 mm for the U-1530, the footprints of the machines have been reduced to enable installation in smaller workshops. Furthermore, the overall height is lower, facilitating access to factories.

U3 machine variants are 3-axis VMCs with a fixed table. Built into the base of U4 models is a larger, more dynamic, rigid rotary table that pivots around a horizontal axis to allow workpieces to be clamped on both faces.

For full 5-axis machining, U5 versions have an integrated rotary-tilt table that can optionally be equipped with a counter-balancing system to eliminate the influence of workpiece weight. Direct-drive rotary tables are available. Low-cost automation is offered in the form of a five or nine pallet pool with automatic pallet exchange. Positioned to the right of the machine, the configuration is said to be particularly well suited to mould making. Alternative automation arrangements accommodate up to 50 pallets.

Whitehouse Machine Tools advises that more than 1,000 of the original U-Series VMCs have been installed and that U-Advanced Series sales in Germany already exceed 50 units. A U5-1530 is available for demonstration in the agent's Kenilworth showroom.

It is also noteworthy that the new machine range is complemented by the entry-level compact series of 5-axis VMCs from Spinner, intended for up to 4-axis simultaneous cycles.

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Innovation and inspiration from Nikken

Doosan horizontal and vertical machining centres installed at Nikken's Innovation Centre Europe (NICe) help showcase the company's latest and most advanced CNC rotary table, and tooling technologies and solutions.

Walk into Nikken's recently opened Innovation Centre Europe (NICe), located at the Advanced Manufacturing Park in Sheffield, and you can't help but feel inspired.

The modern and stylish exterior of the building is impressive. But, it's the 15,000ft² interior and, more specifically, the innovative technology being showcased inside, that's the real eye opener.

With so much discussion currently taking place within manufacturing circles about Industry 4.0 and its implications for manufacturing, Nikken's state-of-the-art innovation centre provides a clear view of applied technologies at work in what are being called 'factories of the future'.

Right at the heart of the centre are two Doosan machine tools supplied by Mills CNC. A Doosan NHM 6300 horizontal machining centre supplied to Nikken in 2014 and a DNM 5700 vertical machining centre installed at the centre in July 2016.

The machine tools selected and installed by Nikken at its Innovation Centre fulfils a number of key, market-led criteria for the company.

Tony Bowkett, group managing director of Nikken Europe, explains: "It's important that the machine tools we have at our disposal reflect market realities. To provide comprehensive, relevant and credible technology solutions our machine tool portfolio needs to be balanced and cover a majority of spindle configurations, and machine tool control systems, used by component manufacturers.

"It also needs to reflect machine tools, manufacturer and model type, that are

prevalent and proven in the market, which explains why we selected the two Doosan machining centres.

Doosan NHM6300 horizontal machining centre

The NHM6300 is a powerful, rigid and robust box guideway horizontal machining centre that features a 22/35kW 8000 rpm spindle, a 200+ tool capacity ATC, twin automatic pallets (630 mm x 630 mm x 2), the Fanuc 31i control and a BT50 dual contact face and taper tooling configuration.

The machine at the innovation centre has been equipped with a Nikken top mounted CNC 501TFA rotary table with swing box and, amongst other applications, is being used to demonstrate the performance, accuracy and productivity gains that can be achieved when using the company's proven and popular X-Treme tool holders to machine large titanium components.

Tony Bowkett says: "There is nothing abstract or fanciful about any of our machining demonstrations or the cutting trials we perform at the centre on the NHM6300 machine. We know that the best way for customers to see and appreciate the performance of our own products is to see them in action on machine tool platforms that they might already have in their facilities, machining similar components that they manufacture, from materials they are accustomed to using, with the same or similar cutting tools.

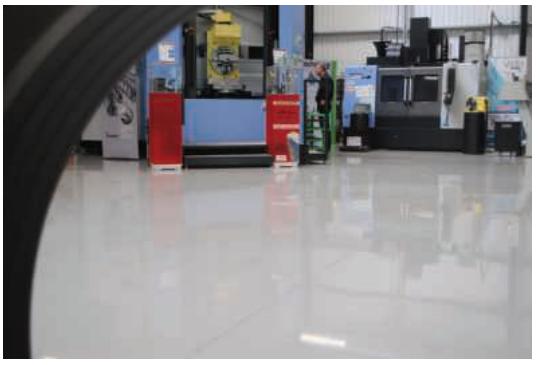
"There is no hard sell because there doesn't need to be. The demonstrations and the results speak for themselves."

Doosan DNM5700 vertical machining centre

The Doosan DNM5700 is a new, next generation vertical machining centre introduced by Mills into the market earlier this year.

The machine is equipped with a 18.5 kW/12000 rpm (directly-coupled) spindle; a 30 tool capacity magazine, and the Fanuc 0iMF control. It also features Renishaw probing, an onboard thermal compensation system, 20 bar coolant-through-spindle capability and BT40 dual contact face and taper tooling.

Tony Bowket concludes: "It's early days with the DNM 5700, and although we are still putting it through its paces, we are impressed by the machine's speed, productivity, optimised harmonics and accuracy.



"We will be ready to demonstrate the machine's cutting capabilities as well as the performance of our own CNC260 Alpha 21 single-axis rotary table and trunnion and wirelessly-linked tooling pre-setters, in the next few weeks."

Tony Dale, Mills CNC's technical director says: "The Innovation Centre is a truly inspirational venue and we are delighted to have two Doosan machines installed at Nikken's facility.

"We have a good long-standing relationship with Nikken and have worked together on a number of collaborative projects over the years. Being able to showcase our own machines at such an impressive and illustrious venue is great news for us, and for UK manufacturers too."

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Asquith Butler increases machine tool offering

Asquith Butler has now bolstered its machine tool offering with the arrival of the new BRAY brand of machine tools. As a complement to the existing SAHOS line of high specification 3- and 5-axis CNC machining centres, the addition of the BRAY product line-up will form the core of an alignment strategy to develop and maximise market penetration in the composite, pattern making, aerospace, light alloy machining sectors.

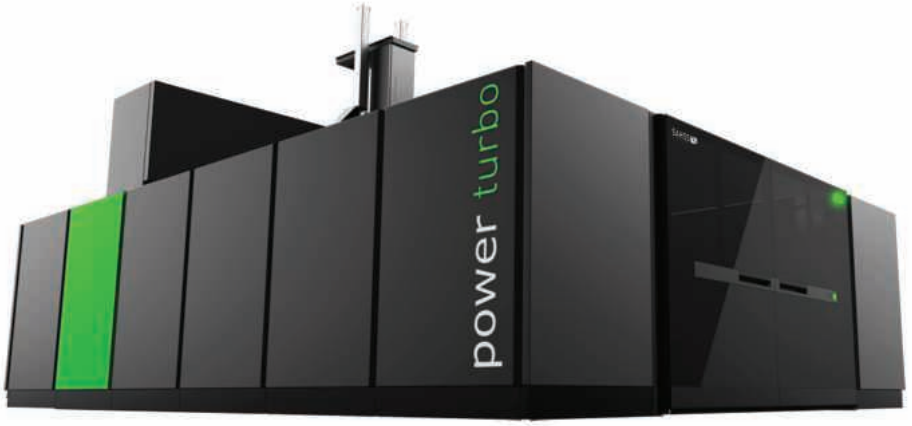
The portfolio extension for Asquith Butler is the result of Czech machine tool manufacturer SAHOS being brought under the umbrella of BRAY (Blue Ray), which is a wholly owned subsidiary of Tool Trade S.R.O, a high-tech group of companies. The synergy will also develop opportunities for the company's fibre laser cutting machines.

The re-structuring strategy of Tool Trade S.R.O presents an exciting opportunity for Asquith Butler, as the company will now offer the new products from BRAY plus a host of cosmetic and design improvements to the existing line of SAHOS CNC machining centres. The BRAY line of machines are aimed at the very high-end mould & die, pattern making, aluminium and light alloy aerospace sectors; providing the perfect complement to the existing SAHOS brand of flexible and highly productive machine tools.

Commenting upon the business alignment strategy, Asquith Butler managing director Paul Hinchliffe says: "The arrival of the BRAY Series of machines offers some exciting new models as well as some smart new configurations for the already popular SAHOS machines. We have had some spectacular initial success with the SAHOS machines here in the UK and we are beginning to see a good machine population develop. The new BRAY machine specifications and layouts will allow Asquith Butler to further develop the market with a specification and price to suit all end-users. The BRAY brand will complement the SAHOS range and enable Asquith Butler to offer even more comprehensive machining solutions than ever before.

''The BRAY product lines will give us potential to target niche application and industry segments that were sometimes beyond the SAHOS brand. Such are the benefits of the BRAY machines, we are confident the popularity and population of BRAY machines grow considerably in the near future."

The SAHOS product line and now the new BRAY brand have been designed and developed to provide uncompromising levels of flexibility, innovation and productivity. With the re-alignment strategy, Asquith Butler is delighted to be extending the level of innovation and technology with product enhancements and a completely new line of machines.



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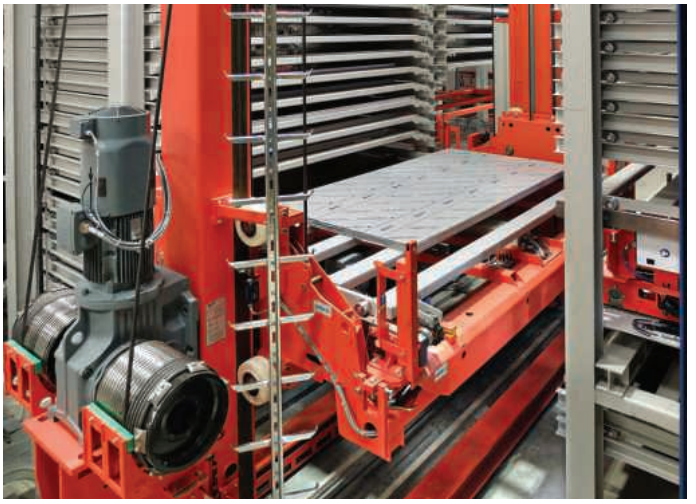
Automated sheet metal processing boosts fabricator's competitiveness

Fabrication specialist Hydram Engineering has invested £2 million in two automated sheet metalworking cells at its factory in Chilton, County Durham. One is an automated CNC punching cell with integrated, 23-shelf tower store for material, which entered service in July 2016. The other, supplied as a turnkey system by Bystronic UK and commissioned in September 2016, comprises two of the Swiss manufacturer's flat-bed, fibre laser cutting machines fed automatically with sheet from a Remmert bespoke six-tower storage and retrieval system.

This year's spend by Hydram follows substantial investment throughout 2014 and 2015, during which the business introduced a panel bender, a second automated paint plant, a third robotic welding facility, a shot blasting machine, an eighth power press and a tenth press brake, whilst adding a further 20 percent of space to its 100,000 sq ft factory.

In addition, further floor area has been freed due to the fibre laser cutting cell's 30 percent smaller footprint compared with that of the former laser cutting facility, which involved a pair of Bystronic CO_2 laser machines and manually accessed, cantilever racking for sheet material. One Bystronic CO_2 laser cutting centre remains on site, a 4.4 kW model with a ByTrans Xtended material handling system, installed in 2012.



Founded in 1977, Hydram has offered subcontract laser cutting for nearly 20 years as part of its services and is now one of the largest metal fabricators in the UK. In addition to precision sheet metalworking, the privately-owned company offers tubular metalworking, welding, powder coating and assembly. Customers include such leading OEMs as JCB, Mitsubishi Electric, Caterpillar, Ideal, Herman Miller and Alexander Dennis.

Most recently, the subcontractor was selected by Hitachi Rail Europe as a key supplier of sheet metal assemblies for the £5.7 billion Intercity Express Project. The multi-million pound contract is for the supply of metal hand poles, painted interior panels, bracketry and assemblies for the interiors of 866 carriages for the Great Western and East Coast Main Lines.

Hydram's managing director David Greatorex says: "Against a background of strong business growth, we decided to upgrade and automate our sheet metal processing to improve manufacturing efficiency.

"It will help us to keep down production costs and increase our competitiveness in the global marketplace, which is important as most of our customers are multinationals that can choose from suppliers internationally.

"Our customers demand flexibility, high quality and keen pricing. The investments we continue to make year after year help us to meet, if not exceed, their expectations.

"We had automated punching and laser cutting in our sights for several years and with hindsight we should have moved ahead with it sooner, as the benefits are so far-reaching."

Andrew Jordan, the company's systems and technical manager says: "A major advantage of automated supply of sheet metal to our Bystronic machines is that we have been able to do away with three fork lift trucks that were previously needed to take pallets of material to the buffer stations.

"To service the fibre laser cutting cell, we now only need one lift truck in the goods-in area to load sheet onto the Remmert input station. Manning levels are therefore reduced, added to which one operator can

run both laser machines, whereas two were needed before to attend their CO_2 predecessors. I estimate that labour costs are 30 percent lower than previously.

"Our health and safety manager tells us that fork lift truck movements are the biggest single risk factor in our factory and any reduction in their use is welcome. It is therefore a bonus that we have been able to reduce their use and enhance the safety of our personnel as well as our machinery and materials."

Due to the speed and reliability with which material is delivered on receipt of requests from the operator of the two new Bystronic BySprint Fiber 3015 4kW machines, sheet metal component productivity has been increased significantly at the Chilton factory. There is minimal idle time while the integrated ByTrans sheet handling systems wait for the next pack of sheet to arrive from the tower.

The store has 120 shelves each carrying up to three tonnes of material from 0.8 mm to 6 mm thick, or previously cut nests awaiting unloading for production. Around half of the aluminium, mild steel, Zintec and stainless steel that is held on site is now accommodated in the Remmert system. The remainder is in the punch press tower or stored conventionally and can be up to 20 mm thick.

A nest of components is cut from a 3,000 mm x 1,500 mm sheet on a BySprint Fiber 3015 in an average cycle time of eight minutes at Hydram. Commencement of the cycle is speeded by Bystronic's Detection Eye feature, which recognises sheet position on the table in seven seconds by scanning it using a camera mounted on the cutting bridge. ByObserver is also fitted to both machines to enable remote monitoring from a mobile phone or PC from any location.

A spin-off advantage of the fibre laser cell is that it avoids the previous issue of fork lift trucks having to transport pallets of material down a steep ramp or around the outside of the building to the former CO_2 laser machines, which were 1.5 metres below the level of the goods-in area, as are the fibre machines. Potential conflict between material movement around the punch presses and the fibre laser cutting centres is also avoided now that both cells are equipped with automated sheet handling.

David Larcombe, managing director of Bystronic UK, says: "The fibre laser cell together with the Remmert storage system at Hydram is a superb installation. You would have thought the factory was built around the manufacturing cell, as every metre of space is used to the full.

Fibre laser cutting has been a great investment for many manufacturers in the UK, as it offers cutting speeds typically two to three times faster than on machines like those that Hydram replaced. Power consumption is around 60 percent lower than with CO_2 lasers and servicing and consumable costs are also dramatically reduced."

David Greatorex concludes: "We have taken a long-term view to secure our future with this latest round of investment. The automated sheet metal processing cells have upskilled the activities of our workforce and raised productivity.

"They have also reduced the labour cost content of component manufacture through the ability to run overnight with minimal supervision and by drastically reducing manual movement of material. It saves double-handling and ensures that we get the most out of the machines.

"We feel that fibre technology has matured to a level where we are confident in its benefits over CO_2, which we have been using exclusively until recently. With both fibre and CO_2 lasers on site, we are able to take advantage of the best of both technologies."

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Universal Robots rack up the benefits at Etalex

Installing a Universal Robot to pick metal parts out of a press brake solved several automation headaches at Etalex; a manufacturer of shelving systems that had no room for safety guarding in front of the press and needed a flexible user-friendly robot able to safely handle the pick and place tasks in a high traffic area. The UR10 robot was up for the challenge.

When entering the vast 300,000 square foot production hall at Etalex, your first encounter is Universal Robots UR10 diligently unloading metal parts of various shapes and sizes into a large press brake. After the press punches holes in the parts, the robot arm's pneumatic suction cups pick the piece back up and stack them in a patterned pile on a cart. As this happens, employees pass back and forth in front of the robot in the busy hall.

Compared to the other 25 robots in operation at Etalex, all placed behind sturdy safety fencing, the Universal Robots application is an unusual sight. The UR robot belongs to a new breed of robots dubbed "collaborative robots" as the built-in force control limits the force at contact and does not cause bodily harm, enabling them to work right alongside employees. Unlike more traditional industrial robots that normally stay bolted down in one spot, the lightweight UR robots can also quickly be moved and reprogrammed for various production tasks.

Jean-Francois Rousseau, plant engineer with Etalex, says: "We needed a flexible automation solution that could be used for 10 different production cycles. Since I only have six feet of space in front of the brake press, it was important that I could run this application without safety caging around it."

Before the arrival of Etalex' new robot colleague, an employee would manually unload the press brake eight hours a day. The manual tasks have now been reduced to an hour daily spent on inspecting the quality of each pallet and changing the coils, resulting in an estimated ROI of about 12 months.

The safe choice

Richard Clive, machine operator at Etalex, says: Before, you had to put your hands close to the brake press. There's always a chance of an accident happening at any time. But with the Universal Robots, there is no chance of anyone getting injured."

Prior to installing the UR10, Etalex got the approval from the Commission de la Santé et de la Sécurité du Travail du Québec (CSST) occupational health and safety commission which approved the use of collaborative robots at the factory.

Even though the risk assessment deemed the robot able to run without safety guarding, Jean-Francois Rousseau decided to install a zone sensor that causes the robot to slow down once an unknown object enters its work space:

Jean-Francois Rousseau says: "This wasn't strictly necessary but having the robot slow down to 20 percent is reassuring for employees just getting used to working with robots unguarded."

Learning by doing

Differentiating the UR robot from its caged peers is also the ease of use. Programming happens on an intuitive touch screen tablet where the user simply presses arrow keys to make the robot move to desired positions. Another option is to put the robot in "teach mode", a feature that programmer at Etalex, Alex Pichette has used extensively: He says: "The teach mode allows you to simply grab the robot arm and show it what moves to perform. Instead of having to go back to a keyboard and enter new data, all programming happens right there on the floor next to the robot. That has saved us a lot of time."

40 percent increase in sales

Savings is key at Etalex where director of operations, Jean Piuze explains that 60 percent of the company's cost is the purchase of steel for the metal racks.

Jean Piuze says: "That means that we have to optimise our production significantly to stay competitive and reduce costs. Automating with robots is the only way we can do this. As a result, we've had a 40 percent increase in sales which also means that we did not need to lay people off because of automation. They have now been freed up to perform more challenging tasks than simple pick and place routines."

UR wherever possible

Etalex is currently working on new robotic

cells with two additional UR10s in palletising applications: one for galvanised shelving and the other for reinforcement channels for shelving. Originally, Jean Francois Rousseau did not think the UR robots could handle these tasks:

Jean Francois Rousseau says: "It required a fast three second cycle, but we figured out a way to create a gripper for the UR robot that can handle seven parts in the same cycle instead of one, which meant that we could easily allow the cycle time to be 20 seconds. Our preference now is to use the UR robots wherever possible."

Canadian market acceptance

Since being introduced to the Canadian marketplace in 2013, the UR robots are now used in a wide range of industries throughout the country. Mark Schick, president of advanced motion & controls, Universal Robots' distributor in Canada, gives an overview:

Mark Schick says: "2013 wasn't just a debut for Universal Robot, but also a market introduction for Collaborative Class Robots. Within 10 months, we've sold Universal Robots into Quebec, Ontario, Manitoba and Alberta and serviced inquiries in Nova Scotia, New Brunswick and British Columbia.

''Of significance has been the acceptance of low-to-no safety guarding by safety engineering professionals, ministry inspectors and plant management associates alike. Across the board, UR's elegant construction coupled with the integrated safety stop feature have gained acceptance to date."

Applications have ranged from simple machine tending, arm actuators for UGV (Unmanned Guided Vehicle), basic and complex automation/material handling on production lines as well as numerous lab applications and traction within the medical device marketplace.

Mark Schick concludes: "End-users clearly appreciate the advantages of a robust, easy-to-use, safety-certified solution that arrives ready to setup and run out-of-the box".

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£750k investment pulls chair base production back to the UK

Suscom Industries, a leading supplier of components to the office furniture industry, stopped all manufacturing over 20 years ago, electing to offshore. Today, after an investment of £750K, Suscom is producing bases for office chairs to a higher quality level, to its own improved design, more profitably and with greater control over stock and availability.

The investment has seen injection moulding of bases return to Suscom using two 600 tonne Romi presses with product handling and assembly of castors managed by three Kawasaki robots. Autonomy from what is effectively generic designs offered by the Chinese, has allowed Suscom to develop its own high quality chair base range.

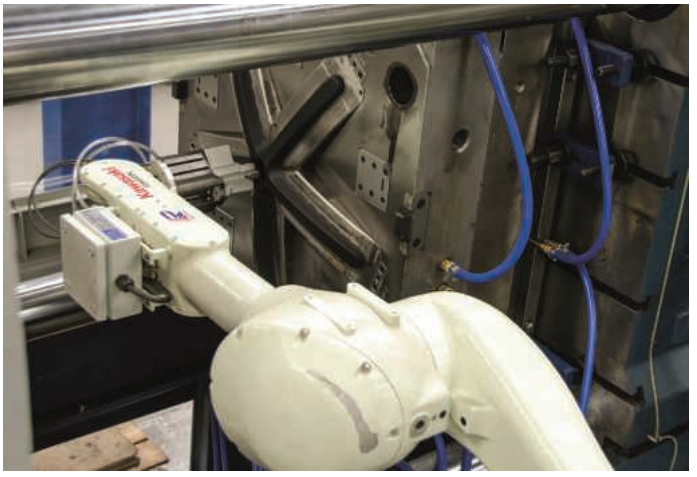
Kawasaki Robotics' systems integrator, Evershed Robotics was tasked with design and installation of the complete cell which was purpose designed around the new tool designs. Cell control is managed through the Kawasaki robots' integrated K-Logic PLCs with each mould tool having its own control box to select the correct programme.

Each Romi press is served by a Kawasaki RS-20N robot which picks the completed moulding and sprue from the mould ejector pins. The new tooling design allows for the sprue to be detached by the tool but to be retained for collection along with the chair base moulding. The robot delivers the sprue to a granulator for recycling and a check to ensure that the sprue is detached from the moulding.

Placing the chair base onto a cooling conveyor the same Kawasaki robot then picks up a slip ring, delivered by bowl feeder, which it assembles into the centre of the moulding. Each Romi press has its own robot and conveyor delivering mouldings to a single Kawasaki RS-50N robot.

This third robot unloads chair bases from the cooling conveyors and places them firstly into a turnover jig and then into a castor assembly cell. Castors can be one of two sizes so the programme ensures the robot is instructed to pick from the correct bowl feeder. After moving to a check point, that confirms the correct size has been picked, the robot then presses the castor into one of the five location points.

On completion of castor assembly the robot picks up the assembled base and places it onto another conveyor where it is finally unloaded manually.



Joel Rockwood, Suscom Industries production manager believes that developing a new chair base, designed for automation, has given Suscom a far better product than the currently available generic designs: "Unlike generic imports, mouldings that come straight from our new tooling require no further coatings or fillers, there are no surface imperfections, and they are overall a much stronger product.

"The cell is absolutely consistent and reliable in its output of 1,000 chair bases per 12-hour shift, which we manage with just two operators. The robot system has surpassed what is expected of it both in speed and in maintaining a very clean and orderly environment."

The system has had a significant impact on Suscom's customer service.

Joel Rockwood concludes:" We could see prices rising in China so creating our own in-house design made sense; the payoff for customers is clear as we have maintained, and even lowered, prices together with adding value such as assembling castors and delivering an all-round better product."

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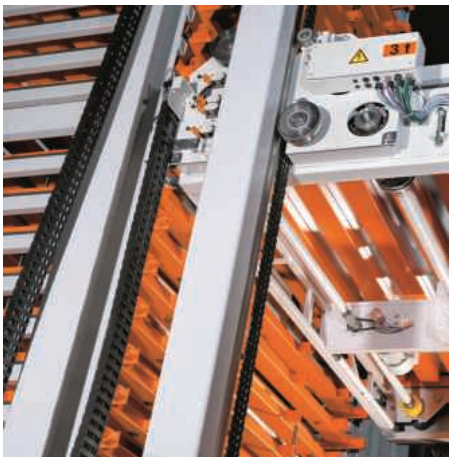
Energy-efficient storage systems



Rising electricity costs are creating a demand for energy-efficient solutions in every industry, logistics and distribution being no exception. So KASTO has developed an innovative energy recovery and storage system for its German-built industrial warehouses, used globally for automated storage and retrieval of bar, tube, sheet, plate and other materials.

The technology enables surplus kinetic energy to be converted into electricity and stored temporarily for later use as needed. Operating and investment costs are reduced and so also are CO_2 emissions. Energy recovery is available as an option on all KASTO storage products and it can also be retrofitted to systems already in use.

The electric circuits for the drives of the operating gantry crane are connected through a DC link. Surplus kinetic energy, such as that produced during braking of the crane or lowering of the lifting gear is converted into electricity and fed back into the grid. The energy can then be used for other purposes, either within the storage facility or by other users. Consumption of electric power can be reduced by as much as 40 percent compared to conventional drive systems.

To achieve even greater efficiency, KASTO optionally equips its storage systems with an integrated energy storage unit. It temporarily holds surplus energy in double-layer capacitors for use as needed. An intelligent controller charges and discharges the energy storage unit, depending on the process currently running.

Power is drawn from the grid at a nearly constant level, allowing peripheral equipment to operate at the rated load. In this way, users can reduce the connected load of the gantry crane by more than 50 percent. Energy storage allows additional cost savings by avoiding load peaks.

Besides significant reductions in power consumption and CO_2 emissions, KASTO's new technology has the advantage that operators of storage facilities can often use smaller transformers, which are less costly to buy.

KASTO was represented in the UK by Rivers Machinery for over 30 years. In 2005, Rivers Machinery was bought out by KASTO GmbH, and KASTO Ltd was formed.

In 2009, KASTO Ltd relocated from its southern base in Southampton, to Milton Keynes, in order to have a central location to all of its customers.

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Two new robots from Comau

The small robot family is growing based on the existing Racer3 technological platform Comau has extended its small robot family for quick applications in restricted spaces, including handling, assembly and pick and place, by introducing two new robots: Racer5-0.63 and Racer5-0.80. Both are controlled by the R1C 19" rack-mounted controller, which can be integrated into a single cabinet to control an entire line. The robots are also available in the openROBOTICS version where the robot is directly integrated into the existing machine and line automation controlled by B&R technologies.

In doing so, Comau keeps its promise made last June, with the launch of the Racer3, when it announced a competitive presence in the small machine sector within a year.

Both robots are built on the Racer3 technological platform, thus offering solutions which share the same components and parts, in a strategy aimed at expanding the integrated range of robots.

In detail, the two new robots expand the capacity of Racer3 in terms of payload and reach. Racer5-0.63 features a reach of 630 mm and payload of 5 kg. Racer5-0.80 is also rated for a payload of 5 kg, but has an extended reach of 809 mm. All the other features of Racer3 remain the same, including the sectors and applications for which they are suited: handling, assembly and pick and place.

Comau is a leading company in manufacturing flexible, automatic systems and integrating products, processes and services that increase efficiency while lowering overall costs. Headquartered in Turin, Italy, with an international network that spans 17 countries and employing more than 12,600 employees, Comau uses the latest technology and processes to deliver advanced turnkey systems that consistently exceed the expectations of its customers. Comau specialises in body joining and assembly, powertrain machining and assembly, robotics and maintenance, as well as advanced production systems and environmental services for a wide range of industrial sectors. The continuous development of its products and services enables Comau to lead the automation industry in meeting the unique requirements of each customer, and through all phases of the project, from design, implementation and installation, to production start-up and maintenance services.

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Güdel gantry robot helps turn the tide on composite manufacturing costs

Composite materials have become commonplace in a number of industries and have become the mainstay of component manufacture in many aerospace, defence, automotive, marine and consumer applications.

Manufacturing large and complex three dimensional components from composites however is often a time consuming and sometimes prohibitively costly process. As for other, more traditional manufacturing methods, automation could hold the key to cost effective production of large composite components. The ATTOM Project (Affordable Tidal Turbines via Optimised Manufacture), just one of 17 integrated capability projects being delivered by The Composites Innovation Cluster under the Advanced Manufacturing Supply Chain Initiative (AMSCI), is supported by a number of technology partners, including Güdel UK.

Led by Cytec Solvay group, the ATTOM project set out to investigate the potential for automation or improved materials handling methods as a route to cost reduction. Also investigated under the initiative were factors that may affect production line layout and the possible solutions to specific quality control problems. ATTOM will ultimately contribute to developing a UK-based supply chain that can produce tidal turbine blades with an improved design and up to a 30 percent labour saving through the use of automated handling and storage techniques.

Cytec Solvay group, tidal turbine blade manufacturers AEL Airborne, project partners and equipment suppliers Assyst Bullmer and Güdel UK have now fully implemented and commissioned an integrated material preparation, handling and storage cell within Cytec Solvay Group's application centre in Heanor. The 10.0M long Güdel Cartesian overhead gantry has demonstrated the repeatability and accuracy for which they have become renowned, dynamically picking the ply geometries from the XY cutting system. The sophisticated end-effector, developed specifically for the application and mounted directly to the Güdel gantry, has proven to be 100 percent reliable in the collection, transfer and deposition of differing complexity ply geometry, some of which are up to 7.0 m in length, within a fully automated storage system. The end effector is capable of rolling the 7.0 m long ply pieces and also flat-picking the smaller ply geometries.

The next stage in the project involves using nesting algorithms to ensure plies are cut efficiently to maximise the utilisation of material, and stored by the Güdel gantry robot in the ply deposition order, therefore reducing or eliminating the average of over 23 hours of manual handling/sorting of plies currently required. Once this is achieved, it will mark the conclusion of this particular collaborative project. However, there is strong potential for transferring this technology to other industries, such as aerospace and marine, where large composite components are being manufactured.

Güdel's expertise within the composites manufacturing sector also extends across a number of different application areas, including laying up composite material within the mould tool and then laser cleaning mould tools between cycles. Güdel automation systems are already operating within a number of high profile composite manufacturing facilities in several industry sectors including automotive, aerospace and renewable energy.

The Composites Innovation Cluster (CiC) will deliver 17 integrated capability projects over a three year period across 28 partners. The CiC is led by Cytec Solvay Group, partnered by Axillium Research Ltd and Composites UK (National Trade Association), with support from strategic partner The National Composites Centre in response to the demand signals of all UK industry sectors. It will address market failures in the composites materials and innovative manufacturing sector, enabling the design and manufacture of lightweight vehicles, structures and devices that would otherwise take place abroad.

Composites UK is the Trade Association supporting the UK Composites Industry. Its aim is to support UK industry so that it may continue to grow and participate in the increasingly competitive world of global composite production.

Solvay's new global business unit is a global provider of technologically advanced light weighting material solutions that enables its customers in the aerospace, automotive and other demanding industries to design, develop and efficiently manufacture high-quality, high-performance and complex composite structures.

Composite Materials has the most extensive product portfolio, including prepregs, resin systems, adhesives and surfacing films, carbon fibre, textiles, tooling and vacuum bagging consumables, thanks to its leadership in advanced materials science, chemistry and application engineering.

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Remmert improves handling and design on BASIC Tower sheet metal 4.0

The BASIC Tower sheet metal 4.0, made by Remmert GmbH, keeps a low stock volume that is economically sensible whilst maintaining flexible handling of sheet metal.

The expert for storage and process technology has given its tried and tested storage tower a completely new facelift. Customers benefit from the shortened assembly and service times and the contemporary design.

During revision of the BASIC Tower sheet metal 4.0, Remmert used the feedback from its customers and incorporated the clients' experience into the storage tower. Furthermore, the expert for sheet metal warehousing was able to implement the current requirements for economics and sustainability. Thus, in addition to a modernised layout, a new overall design of the tower was created. The result is an optimised arrangement of all components, which guarantees shorter assembly times. Individual defective components can also be quickly and easily located and replaced. Thanks to the same part concept, the high availability of spare parts ensures more efficient service times.

Matthias Remmert, managing director of Remmert GmbH says: "Our new BASIC Tower sheet metal 4.0 shows that we place great importance on offering our customers the best possible solution on the market. The modern appearance brings the improved handling options to a complete circle. In addition to the formats 3015 and 4020, the overhauled tower is now also available in formats 6020 and 8020.

Remmert celebrates 70th anniversary

In 1945, Friedrich Remmert founded the company known today as Friedrich Remmert GmbH in Löhne. Since then a lot has happened. The family business has developed significantly with the market for long goods and sheet metal storage and has grown to have over 100 employees.

The company is proud of its success and level of expertise in quick and efficient logistical processes.

To continue its success story, Remmert Gmbh is investing strongly in the future. The expansion of sales in Austria is right at the top of its agenda. The company is excited for the challenges and tasks that the next

decades will bring and look forward to developing the optimal solutions to them with its clients.

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Image-based barcode readers from Cognex

A technology shift is currently underway in the intralogistics sector. An ever-increasing number of distribution centres are changing over from laser-based scanners and complex line scanning technologies to image-based systems. Cognex, a leading provider of industrial vision systems and barcode readers for use in manufacturing automation and logistics, is convinced that this trend is set to continue.

Over the past few years, Cognex has seen an increase in the popularity of its fixed-mount DataMan barcode readers, particularly in sectors of warehousing logistics where laser scanners were used exclusively up until recently. One of the reasons for this is the higher read rate achieved with the patented Cognex Hotbars image analysis technology. Those benefiting from this include online shops and wholesalers, as well as retailers and cooperative company groups, such as the Edeka supermarket chain, for example, which has replaced the laser scanners used to date with DataMan 363 barcode readers.

The logistics sector is increasingly taking notice of the fact that image-based systems work more reliably and offer more advantages than laser scanners. Cognex barcode readers of the DataMan 300 and 360 series use Hotbars image analysis technology to decode even barely legible 1-D barcodes as small as 0.8 pixels per module. They reliably read damaged, distorted, blurred, scratched and low-contrast codes. What is more, they can detect labels wrapped with reflective, glossy film, for instance on pallets with PET bottle packaging. Compared with laser scanners, this allows up to 10 percent higher read rates to be achieved and in some cases even higher.

Image-based barcode readers such as the DataMan 300 and 360 series from Cognex are also faster and more flexible than laser scanners. Using high depth of field and a large field of view, they are able to read several codes simultaneously, regardless of the orientation of the label. A real-time analysis of the read results and/or the image storage with classification and evaluations makes it possible to trace invalid and damaged codes. When making this transition, it was particularly important for

Edeka to be able to check codes for their compliance with GS1 standards. Unlike laser-based systems with moving parts, which are prone to faults and failure, Cognex readers are solid state devices with no moving parts in a compact design. That means less wear and thus less maintenance.

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Mapal partners with MAHLE Powertrain

As one of the world's largest automotive suppliers, MAHLE is a globally renowned manufacturing powerhouse with over 76,000 employees and a turnover in excess of €11.5 billion. With more than ten facilities in the UK, the MAHLE Powertrain manufacturing plant in Wellingborough is a state-of the-art cast iron machining facility that supplies head and block engine sets for a major UK-based construction vehicle company.

The Wellingborough factory manufactures upwards of 700 head and engine block sets every week for the world's third largest construction equipment manufacturer. To ensure the company maintains its high production levels, MAHLE Powertrain employs 22 Heller twin-pallet machining centres than run 24 hours a day, seven days a week. To minimise downtime and maximise productivity, MAHLE has invested in a partnership with cutting tool specialists Mapal.

MAHLE utilises over 170 different Mapal tool assemblies for its HSK63 and HSK100 machines. With product lines including everything from solid carbide end mills, boring tools, drills, taps, reamers, rough boring ISO tools, fine boring tools and specialist tools for crank shaft and cam shaft machining, the diversity of the Mapal brand sees over 90 percent of the MAHLE cutting tool consumption being supplied by the global cutting tool specialists.

The relationship between Mapal UK and MAHLE has demonstrated how a committed partnership between supplier and customer can reap significant rewards. With two full time Mapal employees based in the tool management area at MAHLE, the powertrain manufacturer has all its tooling needs facilitated by the Mapal staff.

Gavin Samwell, a MAHLE Powertrain production technician says: "Mapal supply the complete package, we use their tools in our machines and when the tool life expires we take the tool out, put it in a tool trolley and the Mapal engineers will come in to refurbish, re-tip and re-set the tools. Once the Mapal engineer has prepared the tool for re-use, it is returned to the machine tool carousel to be used again or it is stored in the tool management system."

To ensure the continuous and uncompromising service levels are maximised, the two on-site Mapal tool setters are supported by an additional application engineer that will visit the site to investigate the potential for implementing creative new solutions. This strategy ensures that MAHLE is continually optimising its machining processes.

One recent example of the continuous process development was the installation of Mapal's new Tritan drill. Marketed as a drill capable of cycle time reductions and tool life improvements in the region of 40 percent, this was an opportunity for the three-flute Tritan drill to prove itself in the automotive sector. The Mapal application engineer trialled the Tritan against an existing 13.16 mm diameter solid carbide spiral drill. Cutting a bolt hole in the cast Iron cylinder head, the previous drill operated at 2429 rpm with a feed rate of 672 mm/min (100 m/min at 0.28 mm/rev) to achieve a tool life of 37 parts. At this point, excessive tool wear required a tool changeover. However, the new through coolant solid carbide Tritan drill exceeded the performance of the previous drill, reaching a tool life of 70 parts, a 48 percent improvement.

This is credit to the new Tritan drill geometry that permits higher feed and speed rates whilst enhancing hole concentricity and precision with its self-centring characteristics. Running at a cutting speed of 2204 rpm with a feed rate of 1322 mm/min (90 m/min at 0.6 mm/rev), the Tritan drill has more than doubled the feed rate to reduce cycle times by 60 seconds per cylinder head.

Referring to why the company selected Mapal as its tooling partner, Gavin Samwell says: "Mapal was the one company that offered the most comprehensive solution and service for our needs. Mapal can manufacture the tools at their UK facility and even supply products from other manufacturers where necessary to deliver a complete package."

This complete package includes the management of inventory and costs. It ensures the MAHLE production facility is always tooled with the most productive tooling solutions available. The Mapal management system incorporates the latest technology whilst delivering continuous cost down and productivity enhancements with no procurement costs and a single invoice.

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ITC delivers seismic change for earthquake simulation

The story for any subcontract business is evolve or dissolve. In the case of Surrey-based GPR Ltd, its progression from 3- to 5-axis machine tools initially evolved with a bolt-on fourth axis for its Haas VF2 machines and now a full simultaneous high-end 5-axis machining centre from Matsuura.

The investment in a full 5-axis machine was instigated by the Camberley company winning a two year contract to manufacture aluminium housings for electronic assemblies. With 90 parts required every three months, GPR needed a process that would reduce setup times, improve throughput and provide additional capacity for the ongoing project. Working to provide a complete solution, long term tooling supplier Industrial Tooling Corporation (ITC) met the needs of GPR with its renowned Alusurf range of aluminium end mills.

When the Matsuura MX-520 arrived in May 2016 along with a seat of Edgecam CAM software from Vero, ITC was instantly on hand to support the subcontractor with its long term project. Like any subcontractor with enhanced capabilities and additional capacity, GPR was on the lookout for more challenging work and this arrived in the guise of a 'Hookes joint flange' that is a critical component in an assembly for earthquake simulation and measuring equipment that is used in China.

ITC delivers the complete solution

The EN24T alloy steel flange joint is manufactured in a range of variants that demand numerous machining strategies and tooling setups. Supplying GPR for over a decade, ITC's engineer Dave Cleeve was on-hand along with Neil Franklin from WIDIA to provide a complete tooling solution. Commenting upon the machining strategy for the flange, GPR's machine shop programmer, Stuart Reynell says: "A new machining centre and CAM software combined with new 5-axis strategies can be a daunting prospect, but ITC made sure the tooling and toolholding was never an issue, especially in the case of this complex component. The key objective was to ensure that we could attack all faces of the job with adequate clearance, tool rigidity and machining tool performance."

The flange starts life as a 300 mm diameter by 225 mm deep 125 kg billet and the finished item weighs in at just 28 kg. To remove 97 kg of EN24T alloy steel in the fastest possible time, GPR invited ITC's Dave Cleeve to review the component.

Stuart Reynell says: "ITC's products have always performed extremely well and with the addition of the WIDIA and BIG KAISER brands of indexable cutting tools and high-end toolholding systems, ITC is a prestigious 'full line' supplier. Highlighting this, Dave arrived with WIDIA engineer Neil Franklin to develop a complete solution for our needs."

For heavy duty rough machining of the flange, ITC recommended the WIDIA M200 52 mm diameter shell mill that ran at a 1.5 mm depth of cut with a 35 mm radial cutting width. For this process, ITC applied the BIG KAISER BBT40 toolholder with a face mill adaptor for maximum rigidity. With a spindle speed of 920 rpm and a cutting speed of 150 m/min, the M200 with five indexable button inserts removed the majority of material at a rate of 84.34 cm^3/min. With 12 indexes per insert, the M200 optimised material removal rates and performance whilst reducing tooling costs for the subcontractor. To ensure GPR retained this performance level throughout, ITC supplied the BIG KAISER HMC milling chucks to many of the heavy duty machining processes.

Following the 52 mm WIDIA shell mill, a 16 mm diameter WIDIA 5777 Series solid carbide end mill was then introduced to machine the faces beyond the reach of the shell mill. This tool was followed by the long series AlTiN coated WIDIA VariMill 2 with the WIDIA HPV shrink fit toolholder. The longer reach VariMill 2 and the extended shrink fit toolholder finished the base of the flange with incredible rigidity, stability and performance.

With tool reach beyond 100 mm and the reach of the slim shrink fit toolholder, the VariMill 2 conducted the majority of rough profile machining. For finishing the internal flanks and radii, ITC introduced the 8 mm diameter ball nose 47N0 Series, with an 8 mm BT40 shrink fit toolholder. Once the difficult-to-access faces were complete, ITC applied the new WIDIA 20 mm diameter 7-flute VariMill 3, 772E Series and the BT40 Hydroforce hydraulic chuck for machining the deep internal faces of the flange. With

100 mm effective cutting face, the long series tool ensured optimised material removal with impressive surface finish characteristics.

Stuart Reynell says: "For one of the final operations, we had to machine a 30 degree back-chamfer on a large bore. ITC designed and manufactured the tool for this operation at its Tamworth manufacturing base. It is this bespoke service combined with leading product lines that sets ITC apart. Similarly, we had a challenging titanium assembly for high powered microscopes and ITC was on-hand to recommend suitable end mills that were instrumental in reducing our machining times by 25 percent whilst giving us much improved tool life."

In conjunction with WIDIA, ITC is offering an exclusive discount deal that applies to companies making new plant purchases.

Stuart Reynell concludes: "Tooling any new machine can be an extremely expensive outlay. However, ITC told us about the 'WIDIA voucher scheme' that will give us huge discounts on standard tooling lines for up to 6 months after the purchase of our Matsuura machine. This is a great incentive and it really helps us to reduce the hidden cost of tooling a new machine whilst obtaining some of the best tooling lines on the market.

"We've been a longstanding customer of ITC due to the exceptional product quality, performance and service. As our business has evolved, ITC has been there to ensure we are optimising the performance of our machines with their innovative tooling. Now, ITC is combining the leading BIG KAISER range with Widia tooling lines as well as its own UK manufactured standard and special tooling lines. We are confident that whatever the job, the ITC engineer can provide the most productive and cost effective solution for our business.

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Latest face mill boosts machining of stainless steel turbo housings

Faster cycles and longer tool life in challenging roughing operations

Sandvik Coromant has introduced its M612 face mill, a product engineered specifically for the rough-machining of stainless steel turbo housings. The tool's positive geometry has the effect of providing a smoother cutting action which helps machine shops to eliminate vibration. In turn, higher metal removal rates can be achieved, leading to shorter cycles. The geometry and edge line quality also help ensure reliability and an increased number of components per insert.

Jacques Gasthuys, automotive application engineer at Sandvik Coromant, says: "stainless is becoming a more popular material choice for turbo housings over the conventional cast iron due to its material properties that help improve resistance to exhaust gas temperatures of up to 1300°C, as well as corrosion. Approximately 50 million turbo chargers are produced every year, cast iron and stainless, but the cost of machining stainless is often up to 20 times higher as these operations are often characterised by extremely short and irregular insert tool life, as well as uneven wear. With this in mind, our goal was to develop a strong cutter able to help lower component costs."

The main challenge in roughing turbo exhaust housings is the complex shape of these thin-walled components and their intricate clamping, which together make for a very vibration-prone operation. The new M612 face milling cutter is purpose designed to help overcome this issue. Its positive geometry provides smooth cutting action, which lowers power consumption and eliminates vibrations in roughing operations. This permits greater metal removal and quicker cycle times, which in combination with 12 cutting edges, six on both sides, contributes to lower cost per component.

In a user case example, using grade GC4240 inserts to rough a stainless turbo exhaust housing, the use of an M612 face mill in place of a competitor cutter allowed spindle speed to be increased from 212 to 273 rev/min, cutting speed to be raised from 70 to 90 m/min (230 to 295 ft/min) and feed to be increased from 0.13 to 0.18 mm (0.005 to 0.007 inch). At the same 2.5 mm (0.098 inch) depth of cut, the result of the trial showed that the M612 face mill reduced machining time per component by 27 percent, while tool life increased by as much as 172 percent.

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Cutting tool inserts in new coated carbide grades improve cast iron machining

New CA3 series and K series chipbreakers maximise performance from rough cutting to finishing

Kyocera Corporation has developed a new line of indexable cutting tool inserts to improve cast iron machining. Made from new grades of CVD coated-carbide materials, Kyocera's CA3 Series and chipbreaker K Series inserts offer significant improvements in machining cast iron components for automobiles, industrial machinery and many other heavy-duty applications. The new inserts address rising demand for metalworking tools that can deliver stable machining performance over a wide range of cutting conditions.

The CA3 Series uses a newly developed CVD coating with a pink-gold finish over a carbide base metal. Kyocera has improved the adhesion strength of the coating layers to ensure longer tool life and consistent processing of cast iron. Furthermore, newly designed blade-edge shapes on the new chipbreakers maximize performance even under high-load machining.

Three types of new materials and chipbreakers are available to address all aspects of cast iron machining, from rough cutting to finishing. Kyocera will continue to develop optimal insert grades to maximise users' productivity in diverse cutting conditions.

CA3 series

Kyocera has used newly developed CVD coating technology for cast iron machining in its CA3 Series. In addition to increasing the adhesion strength of the coating layer by optimising the crystalline structure of each layer, abrasion and fracture resistance have been increased by adopting hard-surface coatings and improved surface layer coating conditions. Kyocera has also adjusted the balance between layers for various applications to enhance tool life and ensure consistent cutting.

K series

The surface of a cutting tool insert incorporates grooves and uneven rough areas called "chipbreakers" that efficiently break and remove chips of metal from the workpiece. A chipbreaker's purpose is to ensure chip evacuation, thereby preventing quality problems and process interruptions caused by chip buildup and/or damaged blade edges.

Kyocera's K series features three newly designed edge shapes to maximise performance when combined with the new materials in the CA3 Series. By creating specialised chipbreaker shapes for specific applications, higher stability and cutting consistency can be expected even under high-load cutting conditions.

Headquartered in Kyoto, Japan, Kyocera Corporation is a leading manufacturer of fine ceramic components for the technology industry. The strategically important divisions in the Kyocera Group, which is comprised of 235 subsidiaries, are information and communications technologies, products which increase quality of life, and environmentally friendly products. The technology group is also one of the oldest producers of solar energy systems worldwide, with more than 40 years of experience in the industry.

The company is ranked #531 on Forbes magazine's 2016 "Global 2000" listing of the world's largest publicly traded companies.

With a global workforce of over 69,000 employees, Kyocera posted net sales of approximately €11.59 billion during 2015/2016. The products marketed by the company in Europe include printers, digital copying systems, microelectronic components, and fine ceramic products.

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Guhring gets groovy

With its new grooving systems Guhring is expanding its product portfolio of stationary tools for turning operations. In addition to the most comprehensive programme of rotary cutting tools, Guhring is complementing the turning and grooving tool sector with the type 104/106 systems for internal and face grooving in small holes, the 305 system for external/internal and face grooving and also form grooving tools for a grooving depth up to 5 mm.

The manufacturer has developed a complete system solution in the field of bore machining for the small diameter turning sector. With the expansion of the grooving system, machining operations such as boring, profiling, grooving, threading and broaching are now possible in addition to the existing core applications of drilling, countersinking, reaming and milling.

Alongside the comprehensive standard range of clamping holders, cutting inserts and indexable inserts it is of utmost importance to analyse customer requirements and implement flexible as well as economically efficient special solutions.

With the new grooving systems from Guhring, the company further expands its position as a complete supplier for the automotive industry, general mechanical engineering, subcontract manufacturing and in the hydraulics and pneumatics sectors.

With an unparalleled price to performance ratio, maximum accuracy and product quality, highly flexible solutions and short reaction times with extremely short delivery times, the new Guhring line will get your business into the groove!

Guhring Ltd employs a team of field technical support engineers and in house design and application engineers who are focused on offering customers with a continuous stream of the very latest in cutting tool technology. The need to

support manufacturing is the main goal and this is achieved by ensuring that optimised tools are designed, developed, manufactured and applied.

Guhring Ltd can offer all the above from the company's UK operation and this is complemented by an extensive stock holding of standard and special products. With a range of 1620 standard products in over 44,000 sizes the aim is to provide the ideal tooling solution in the fastest possible time.

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Stampede for TaeguTec's new Rhino insert grade

The popular TaeguTec turning line has now been extended with the arrival of the new V-Type turning inserts with an innovative ML chipbreaker design. The RhinoRush grade of TaeguTec inserts now incorporates this V-Type insert for the high speed turning of steel, stainless and hardened steel, gray cast iron, aluminium alloys and high temperature alloys.

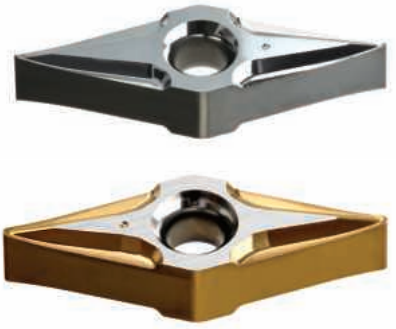
The new ML chipbreaker on the V-Type inserts is ground for impeccable precision and edge sharpness that reduces the cutting forces and the built up edges that are commonplace when machining many material types. By reducing the cutting forces and the resulting built-up edges, the new RhinoRush V-Type inserts deliver impressive tool life and surface finish results.

The sharp new insert line is a double sided negative type ground insert that provides customers with more cutting edges per insert and consequently a better cost-per-insert economy rate. Furthermore, this sharp-edge design and chip breaking geometry make the new RhinoRush V-Type particularly impressive on aluminium alloys and high temperature alloys that demonstrate particularly adhesive characteristics.

Suitable for machining at depths of cut up to 1.5 mm with cutting speeds beyond 40m/min, the negative 35 degree rhombic insert line is currently available with TaeguTec's PVD coated TT5080 grade and also the highly regarded uncoated K10 insert grade for machining cast iron, titanium alloys and other high temperature alloys.

TaeguTec is a globally recognised supplier. The company supplies high quality products to a network of subsidiaries and distributors in more than 40 major countries. Each office is equipped with the latest technology and a team of dedicated staff to discuss customer support, engineering and product development needs. This is supported by warehouse and logistic facilities.

A 24-hour delivery system in Europe functions from its central warehouse in Belgium. Each office provides staff speaking the local language and English. Employees



are also trained to provide technical seminars to support its clients and distributors in each local market. This is supported by annual customer technical seminars and conferences at TaeguTec's advanced manufacturing facility and R&D headquarters in Korea.

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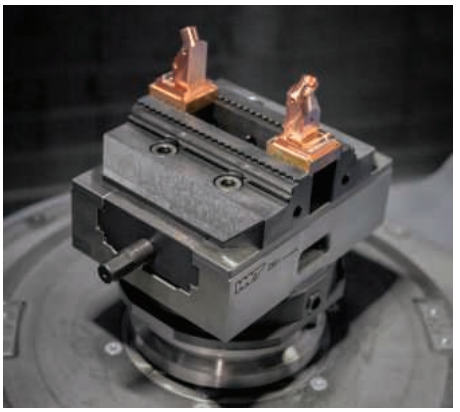
Machine tool investment leads to workholding versatility

CNF Precision Engineering has experienced significant growth over its 50 years driven in part by its willingness to invest in the latest machine tool technology. The most recent evidence of this are the four Matsuura machining centres, the arrival of which has created a lights-out production capacity maximising the large pallet pools on the machines. These four machines, along with a range of other high-end machine tools, has provided CNF Precision Engineering with a capability of producing a diverse mix of work, from low-volume through to batches running to 1,000s, for industries ranging from aerospace and medical, which are its core activities, extending to the motorsport, automotive and scientific instrument sectors.

CNF Precision Engineering's managing director Neil Fearnley says: "With our investment policy we have created a working environment that allows us to be able to respond quickly to customer needs and provide the level of technical support and quality control to maintain 100 percent on-time deliveries and 100 percent quality assurance. We have developed our own, in-house, business management software to deliver efficient production control meaning we can schedule delivery of kits or single components via kan-ban, direct to stock or, direct to the assembly line for customers. Through investment in the latest machines, and the equipment supporting those machines, we have created a competitive edge."

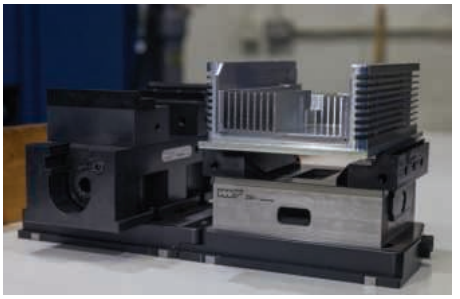
This combination of multiple pallets and 5-axis machining at CNF Precision Engineering called for a versatile workholding system and, as the company was using WNT for its cutting tools it was a logical step to invest in WNT's workholding system as well. Key to the use of the WNT system was the versatility of its MNG Zero



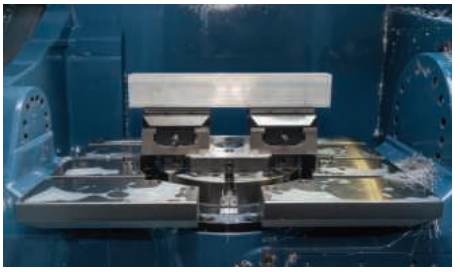
Point base plates that allow extremely quick and accurate changeover from one setup to another, with multiple setups possible on a single base plate, thanks to the option of one, two, three, four, six, and ten location points. This alone can generate significant time savings and productivity gains. Initially every one of the 32 pallets on CNF Precision Engineering's Matsuura MAM72-35V 5-axis machine was equipped with single position MNG Zero Point base plates. With the arrival of the Matsuura H-PLUS 300-PC15 and MX-520 simultaneous 5-axis machine works manager Mark Baron looked to expand its use and introduced double and triple location MNG base plates.

Mark Baron says: "The WNT MNG system along with the ZSG centric vices and ESG

fixed jaw vices that we use have proved to be highly versatile. We have added to them as we have progressed, making use of the different jaw systems available for the vices. While the majority of our setups are single parts per pallet, the ability to mix and match vices on the MNG base plates is an obvious advantage and allows for extended unmanned operation, Another key feature is the enclosed leadscrews on the WNT vice system. We looked around and couldn't find this feature on other vices. Given the number of pallets that we have, this feature is invaluable as we can't afford the time to clean swarf from the leadscrews of all our vices, or indeed continually replace them due to swarf damage."



With the WNT MNG Zero Point system CNF Precision Engineering can maximise the potential of its multi-pallet machines, setup is speedy due to the single clamping screw on the system and repeatability is guaranteed to within 0.01 mm. Its low profile of 30 mm also makes it ideal for 5-axis machining. Versatility is then created by the choice of vices and jaws systems



available from WNT. At CNF Precision Engineering the main vices in use are the ZSG 3 and 4 centric vice and the ESG 100 single clamp systems. The ZSG range has a maximum gripping force up to 35 kN and components up to 303 mm in length can be held securely in its jaws, yet they remain very compact, a major benefit on CNF Precision Engineering's high-end, multi-pallet, 5-axis machines. The jaws used on these vices feature precision matched slides which result in repeatability of +/- 0.01 mm, with added efficiency and accuracy aided by the use of a backlash free ballscrew.

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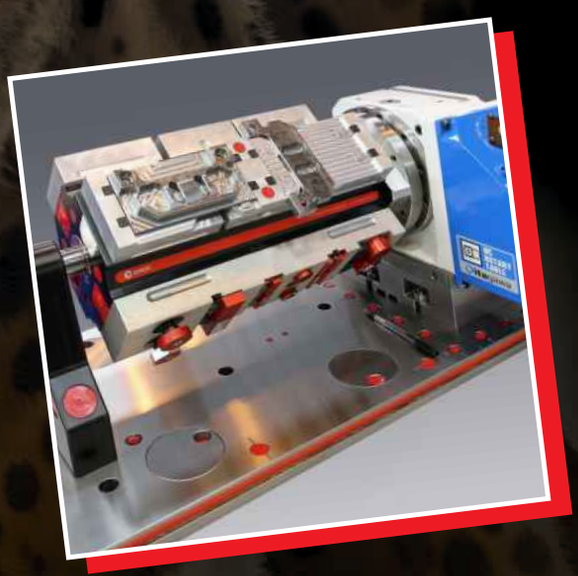

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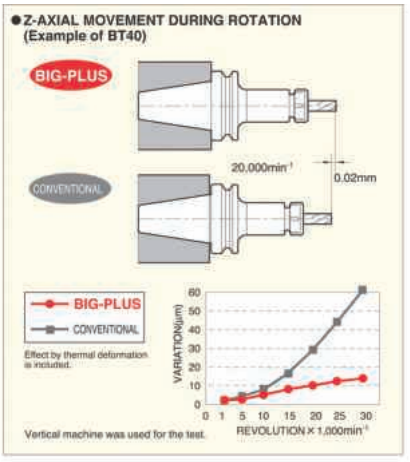
Two B's or not Two B's - the BIG Daishowa advantage

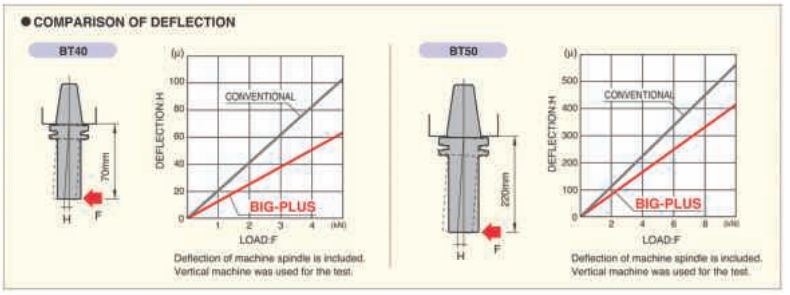
by Neil Vine, Industrial Tooling Corporation

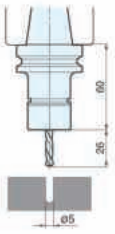
When it comes to machine and toolholder selection, many engineers either specify spindles to suit existing toolholders or they rely on suppliers to provide guidance. After all, do they really have time to work out whether it's best to select a CAT, Capto, HSK, BT, BMT, VDI or BBT system? With the rise of toolholders marketed as 'face and taper' contact systems, ITC needs to explain why all toolholders are 'NOT' the same.

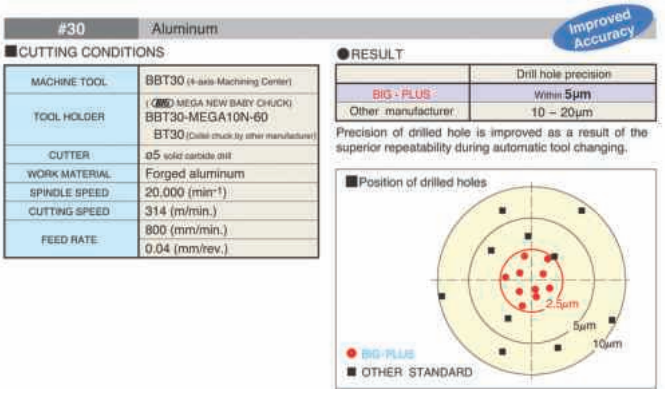
We've heard all the noise and marketing spiel about 'face and taper' toolholding systems and the added benefits of improved rigidity, precision and performance. But did you know that BBT is an abbreviation of BIG BT or what is commonly known as the BIG PLUS system. Did you also know that the BIG PLUS face and taper spindles from the BIG Daishowa Group, which is now more commonly known in Europe as BIG KAISER, are the only genuine, face and taper toolholders on the market? Everything else is a pale imitation.

At present, the BIG PLUS system is available and readily installed on machines from over 200 different licensees. This list includes names such as FANUC, Makino, Matsuura, Mazak, FPT, Correa, DMG, Doosan, Dah-lih and many more household names from around the machine tool industry. The right choice of BIG PLUS face and taper toolholder interface for many of these machines is available exclusively in the UK from Tamworth based ITC.









A missed opportunity

Many manufacturers will believe that they have a standard BT spindle configuration when in-fact; they have a BIG PLUS system that readily accepts BT toolholders as well as BIG PLUS toolholders. In the chase for the 'holy grail' of precision, rigidity and machine performance, engineers will invest in shrink fit toolholders, balanced high-end tools and even a 'face and taper' contact toolholding system. However, the end-user is often duped by an inaccurate marketing message. Without a genuine BIG PLUS face and taper contact system, all the benefits of high-end tooling and shrink fit holders will only deliver limited gains.

This is truly a missed opportunity as a genuine BIG PLUS system massively increases tool life. In many instances the tool life of particularly costly tools has more than doubled by simply changing the tool holder to a BIG PLUS system. With the high cost of some cutting tools the payback period of a BIG PLUS system through tool life improvements can be just a few weeks.

The original and only 'Face & Taper' system

More companies are jumping on the marketing bandwagon of 'face and taper' contact toolholding systems. Unfortunately, none of this marketing admits the underlying truth. The truth that only the BIG PLUS from BIG KAISER provides 100 percent face and taper contact.

For example, many leading toolholders use a collapsible taper system. Of course, this system is in contact with the face and taper, but its rigidity, precision and overall performance still falls far short of the genuine BIG-PLUS system. For other less innovative systems, the taper will have very limited contact due to the taper angle of the toolholder being different to that of the machine spindle. The result is limited contact between spindle and toolholder, on both the face and the taper surfaces. As a manufacturer, you've just made a poor investment that won't yield the desired gains.

So what is the benefit of the BIG-PLUS BBT system?

Not only does the BIG PLUS toolholding system work on the elastic deformation principal, it also generates significantly more contact with the spindle interface. The more contact, the greater the rigidity, stability and precision. For example, a standard BT30, BT40 and BT50 toolholder will have the respective face contact of 31.75, 44.45 and 69.85 mm. In contrast, the BIG PLUS averages 40 percent more contact on the face with a contact area of 46, 63 and 100 mm for the BBT30, BBT40 and BBT50 toolholders. These comparative figures are also applicable to MAS 403 (BT) and DIN6987 (DV) systems where the BIG PLUS face and taper system is applied. Without perfect contact on the face, the standard BT spindle has poor taper contact that translates to an average contact area 4.5 times lower than the BIG PLUS system - a huge difference.

Precision is the key

The huge difference in contact between the face and taper on the BIG PLUS and the standard BT configuration is the result of precision grinding of the BIG PLUS toolholders and spindle. This precision is also evident with the drive key inside the spindle. The gap between the ground toolholder keyway and the spindle drive key is 0.075 mm, as close as comfortably possible without creating an interference fit. In contrast, a standard BT system will have a maximum gap up to 0.33 mm, more than five times the gap of the BBT system.

Deflecting from the benefits

All this precision grinding and tight fitting serves a purpose. Tool deflection is a core factor in disrupting surface finishes, tool life and precision. The vibration causes considerable stress on the tools, the spindle and the subsequent performance and longevity of both spindle and tools. With a standard BT40 toolholder using a tool overhang of 70 mm, the deflection is in the region of 0.1 mm when cutting at a load of 500 Kg/F. In comparison, a BBT40 will deflect at less than 0.05 mm, 50 percent less.

Unfortunately, deflection extends exponentially with tool overhang. On a VMC with a 200 mm tool overhang, a BT50 will deflect at over 0.6 mm when loaded with a cutting force of 1,000 Kg/F. The deflection on a BIG PLUS toolholder is over 30 percent less at a figure below 0.35 mm. For a more conventional example, a 16 mm diameter end mill with a distance of 100 mm from tip to spindle face, cutting steel at a depth of 3 mm will have a deflection of 0.1 mm with a BBT40 toolholder. This will be 60 percent greater with a BT40 running at a deflection of 0.3 mm.

This huge variation also has an impact upon repeatability. When conducting 50 tool changes with the 200 mm tool holder, a BT shank has a dispersion rate of 3.8 microns. This deviation in repeatability is reduced to 0.64 microns with the BIG PLUS system. What does this mean in practical terms? Repeatedly drilling holes at 20,000 rpm, the BBT30 consistently maintains a precision repeatability of less than four microns. A standard BT30 has a deviation from 10 to 20 microns. The misfortune for the majority of workshops is that they cannot achieve the precision or repeatability they require. The result could be easily obtained by just changing to a BIG PLUS toolholder, providing the machine tool is compatible.

Seeing the signs

Unfortunately many machine shops will never realise the benefits of a high quality BBT BIG PLUS toolholding system. Why? It takes a paradigm shift in thinking. Engineers only genuinely look at their toolholding system when the extremely tight tolerance job comes through the door, or the particularly troublesome material that burns through cutting tools arrives. Only when such a scenario arises, manufacturers take steps to investigate high end toolholding. Even then, many look at costly shrink-fit systems. The logical step for many should be to check the spindle configuration with the machine manufacturer and install a BIG PLUS face and taper contact toolholder system wherever they are compatible. One simple step to identify excessive toolholder vibration is to check the toolholder taper for corrosion. If corrosion appears on the taper, it is most likely 'fretting corrosion'. This is a direct result of the tool holder vibrating excessively inside the spindle. If you're not pushing your machine and tools, then fretting corrosion may be the only sign of inadequate tool holding.

For manufacturers pushing their machines closer to the limit, other visible signs will be poor surface finishes, excessive tool noise and consequently poor or inconsistent tool life and precision. It's only when end-users make the change to the BIG-Plus system that they genuinely realise the benefits and regret they didn't make the changeover sooner. The BIG KAISER toolholding system is recognised to improve tool life by beyond 30 percent over conventional toolholders. The reduced vibration also allows the machine to be operated at speeds and feeds up to 40 percent faster, giving huge productivity gains. As well as these immediate benefits, the allocation of robust toolholding extends the service life of the machine tool.

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Multiplicity of workpiece clamping solutions for flexible machining cell

Workholding equipment supplier, 1st Machine Tool Accessories has provided tombstones with quick-acting, versatile clamping fixtures for six of the 10 pallets in an Okuma flexible machining cell (FMC) at control valve and marine steering system manufacturer, Hydraulic Projects (Hy-Pro). In addition, 1st MTA has equipped two original tombstones with heavy duty, rapid workpiece clamping devices to minimise setup times.

The hydraulic equipment manufacturer's website: **www.hypro.co.uk**, displays a caption that reads: "Machining 95 percent of our own components gives us control, flexibility and economy." It also gives the company a large requirement for efficient ways of clamping its valves and pumps during manufacture.

A hallmark of the horizontal-spindle FMC at the Dawlish, Devon factory is the sheer diversity of workholding systems employed in the cell, made possible by the extensive variety of equipment offered by 1st MTA and also by the ingenuity of Hy-Pro's engineers. They have designed and machined in-house additional fixtures that dovetail neatly with the elements that have been bought in.

The rationale for populating the FMC with bespoke, multi-component fixtures dedicated to product families is to keep the Okuma spindle running virtually continuously during manned and unmanned shifts, producing economically any batch size from one-offs to 100s.

To this end, the machine was supplied with a 218-tool magazine, so cutters are exchanged only when they are worn, eliminating the need for tool setups when starting a new batch. Workpiece setup is carried out offline at a station in the pallet pool guarding, so the spindle waits only for as long as it takes to deliver a pallet to the machine and rotate it into the working area.

The first two 400 mm pallets had already been equipped with cast iron tombstones, for which bespoke support blocks were machined by another Okuma customer in the Midlands prior to delivery of the FMC to Dawlish. For retrofitting onto these tombstones, 1st MTA supplied 32 heavy duty, expanding clamping elements from Finnish firm, OK-VISE. On one pallet, each serrated clamp on every face secures one component against a fixed jaw, while on the other pallet, tightening a pair of central clamps fixtures two parts simultaneously.

Machining of two types of hydraulic spool valve from iron castings is completed in two operations on this pair of pallets, 16 of each type coming off complete per cycle. Hy-Pro's machine shop manager, Kevin Saunders advises that one operator previously produced 32 valves per day shift, whereas the number has doubled in the FMC, as it is run unmanned into the night.

Shortly after the FMC was commissioned in November 2015, its next four pallets were fitted with US-made Multi-Lok System five columns from Chick, one of 1st MTA's sole agency product lines. The four faces of each column have either a Chick faceplate to which bespoke, multiple clamping fixtures are attached, or a Qwik-Lok fixture with machinable soft jaws and strong pull-down action for clamping two larger parts simultaneously when the handle is turned. Sometimes, especially when holding castings, the latter clamping action is augmented by the addition of Chick gripper inserts tilted to match the draft angle of the casting to ensure maximum grip.

For one of the faceplates, 1st MTA supplied compact Uniforce clamps produced by another US company, Mitee-Bite, which expand in two directions to hold a pair of components simultaneously against fixed rails. Each steel wedge spreads the clamping force uniformly on both sides. Again, speed of setup and component load / unload is the aim, ensuring that the pallet pool is always replenished.

Within six months of production starting, two further pallets were equipped with tombstones, this time from Abbott in the US, supplied through 1st MTA . Traditional in style, they differ from the others on site by being made from a cast aluminium, self-ageing alloy called Tenzaloy, said to have similar damping properties to cast iron. Kevin Saunders was initially doubtful of the claim, but has since been convinced, as positional tolerances of ± 25 µm are held easily on machined features of components

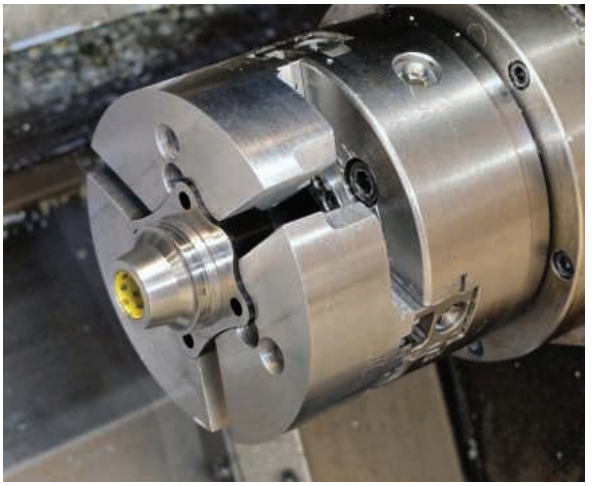
mounted even at the top of the Abbott tombstones.

An advantage of the lighter weight, aluminium alloy columns is that there is scope for fixturing a greater number of heavy components without reaching maximum pallet load, which in the case of the Okuma machining centre is 400 kg. One of the cast iron tombstones was recently very close to this limit when fully loaded with fixtures and components.

Another Mitee-Bite product supplied by 1st MTA augments the Abbott tombstones, namely Pitbull clamps with two tool steel knife edges in a top rail and another in a bottom support rail that grip securely into the faces of iron castings. The low-profile workholding units, which were easy to configure with bespoke fixtures made in-house by Hy-Pro, provide maximum access for the tool to the workpiece for flexibility of machining.

Now that eight of the 10 pallets in the FMC have been populated with highly efficient workholding fixtures on the various styles of tooling column, the eight- or nine-hour manned shift is supplemented every day with unattended machining up to around 1.00 am, giving 16 hours of production in every 24. Kevin Saunders predicts that, when fixtures have been made for the two remaining pallets, production will be extended to 22 hours per day.

He mentioned that 1st MTA has also assisted the turning department at Dawlish by providing a workholding solution for turning an aluminium cylinder end cap. An Abbott pie-jaw chuck has been supplied that fits into the counter spindle of the Colchester lathe so that the component's outside diameter and internal profile can be turned in one hit. It is a second operation, the first being on a machining centre; the main spindle of the Colchester lathe is not involved.



For the same machine, when it is used as a twin-spindle lathe, the pie jaw is replaced by a Kitagawa QCRL42 collet chuck supplied with requisite adapter plate, the Japanese manufacturer being another principal for which 1st MTA acts as sales agent in the UK. Kevin Saunders prefers the collet design to a standard jaw chuck, as he says it allows higher accuracy of machined components and is easier to use, as the inconvenience of having to set and bore out chuck jaws is avoided.

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Hydraulic expansion technology

With the SCHUNK TENDO Slim 4ax hydraulic expansion toolholder, it is now possible to combine the complete outside geometry of heat shrinking mountings according to DIN 69882-8 with the proven qualities of SCHUNK hydraulic expansion technology. The slim precision mounting makes it ideal for use in series production, particularly in the automotive industry.

It was particularly designed for axial operations, and shows its strength during milling close to interfering contours, countersinking, and reaming in 5-axis centres and the die and mould industry. Test series prove that the mountings with the vibration-damping properties of the hydraulic expansion technology have considerably improved the process during milling operation. The hydraulic expansion toolholder design reduces peak cutting amplitude of the force progression in Y-direction, which results in less deflection of the tool. By reducing the load of the cross cutter and the cutting edge, considerably longer service life can be achieved. Additionally, the user benefits from having exact gauges for holes and maximum precision at the workpiece.

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

The MQL-capable mounting is dirt-resistant and is extremely low-maintenance. In contrast to the heat shrinking toolholders, it has a permanently high run-out accuracy of < 0,003 mm at an unclamped length of 2.5 x D and a balance grade of G 2.5 at 25,000 rpm, the SCHUNK TENDO Slim 4ax seamlessly fits into the proven hydraulic expansion toolholder program from SCHUNK. In the first step, the mountings are available for the interfaces HSK-A63 with ø10mm/L1=120mm, ø 12 mm/L1=90 mm, ø 12 mm/L1=120 mm, ø 14 mm/L1=90 mm, ø 14 mm/L1=120 mm, and ø 20 mm/L1=90 mm. Further variants with ø6 mm to 32 mm and L1-dimension of 90 mm, 120 mm, and 160 mm are already planned.

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Is your LEV Test Report as comprehensive as it could be?

Filtermist explains the implications

As people that live and breathe (no pun intended!) Local Exhaust Ventilation (LEV) testing, Filtermist's dedicated LEV engineers are still sometimes surprised by the varying levels of competency they encounter when talking to customers about their experiences of LEV testing.

Anyone responsible for ensuring workplace air is safe already knows that all LEV systems are subject to a number of legal requirements.

The Control of Substances Hazardous to Health (CoSHH) Regulations 2002 Regulation 9 states that in addition to testing by a competent person at least once every 14 months, 'every employer shall keep a suitable record of the examinations and tests and of repairs carried out as a result of those examinations and tests, and that record or a suitable summary thereof shall be kept available for at least 5 years from the date on which it was made.'

LEV Engineer Jamie Allen elaborates: "HSE recommends including a wide range of information in LEV test reports to ensure an accurate record of both the LEV system and the examination results.

"It seems like common sense to experienced LEV engineers to include as many details as possible, but we still hear from customers who have been given a one-page summary sheet as the outcome of an LEV test. This is all very well until there is a problem and it proves difficult to back-track and cross-reference with previous test results."

Filtermist has carried out LEV tests for some customers who have already had equipment tested, but felt the service was not as stringent as it might have been. Jamie Allen continues: "Some employers double-up on their LEV testing to ensure their systems are working properly. They may receive the service as part of their business cover through their insurer, but still pay for a third party to carry out additional tests for their own peace of mind. We recently came across an example of this with a customer in Sheffield, they had already had an LEV report done through their insurer, but they weren't happy with the quality of the report.

"We re-tested all LEV systems on site and made some recommendations on the basis of our findings. On this occasion nothing serious was found, but if the customer implements the suggestions we made they will be able to improve the operating efficiency of at least two of their LEV systems."

All LEV Test Reports compiled by Filtermist include the following information:

- Initial risk assessment
- Safety policy
- Method statement
- Customer name and date examination took place
- Reference number for system that the report relates to
- Substance / process being controlled
- A photo of the LEV system and product reference
- Details of the systems intended performance
- Test point details
- Quantitative assessment readings and details of any repairs required

- Statement of competency for the Test Engineer
- Safety policy
- Report observations and recommendations for improvement

Filtermist currently produces its comprehensive LEV Test Reports manually, but is planning to move to a digital system early next year. As well as meaning test results can be sent straight to the customer as soon as the report is finalised, it will make it even easier to retrieve the necessary documentation in the eventuality of a request from HSE.

"LEV Test Reports play a vital role in ensuring the control measures taken by an employer are working as intended and safeguarding employees from potential exposure to substances hazardous to health," comments Jamie Allen.

Whilst Filtermist's background is in effective oil mist removal, it also has extensive experience in dust, fume and smoke extraction and its dedicated LEV team provides CoSHH compliant LEV testing for all makes and models of LEV systems.

To book CosHH compliant LEV Testing from Filtermist's P601 accredited engineers Email: l**ev@filtermist.com** or call **01952 209967**

Useful resources

Download this HSE guide 'Clearing the air - A simple guide to buying and using local exhaust ventilation (LEV)' for a plain English explanation of what employers need to do to ensure compliance with CoSHH regulations, or follow the link below to read CoSHH regulation 9 in full:

www.legislation.gov.uk/uksi/2002/2677/regulation/9/made

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Pioneering solutions from a world leader in fume extraction technology

The iQ operating system from BOFA brings multiple performance enhancements for higher efficiency of extraction, individual filter status monitoring and integral design features that combine to deliver a lower cost of ownership. Most importantly, it also addresses the issue dreaded by most production teams i.e. downtime, by minimising the potential for interrupting production for unplanned filter changes.

The hugely successful introduction of the iQ based extraction systems in 2012 established a step change in fume extraction technology. For the first time, users were able to monitor real time filter performance and access system data to support fast and effective filter replacement and system maintenance.

iQ second generation combines filed proven iQ reliability with a range of new and highly advanced feature enhancements, adding significantly to the list of user benefits.

iQ is compatible with a number of BOFA's AD laser extraction systems and is offered in three distinct versions, each providing an increased level of control and scalable options for accessing information. Sophisticated and advanced technology is inbuilt, so all the technology is inside to provide a user-friendly and intuitive experience with the data being easy to access and analyse locally or remotely (from data downloaded via USB). It means that filter changes can be planned at a time to minimise or eliminate interruptions to production so business can continue as usual, as well as helping to avoid any costly or time-consuming service call-outs.

The iQ operating system incorporates a method for monitoring the status of both the pre filter and combined main filter. Pre blockage warnings provide operators with ample time to prepare for a change by identifying which filter needs replacing and when so the uncertainty and guesswork is removed.

Clever filter design is another aspect integral to BOFA's products and delivers an extended filter life for the more expensive HEPA main filter that helps minimise the overall cost of ownership. BOFA's innovative and patented DeepPleat filter technology is based on reverse airflow

operation so more particulates are extracted early in the process, before reaching the main filter. The DeepPleat DUO filter process has a large size 15 litre volume capacity 'drop out chamber' that further boosts the removal of particulates.

The operating 'easy read' control panel is on the top of each unit on a sloping fascia front so the data is easy to view.

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What works best for mist collection?

by Brent Saylor, senior applications engineer, Air Quality Engineering, Inc

In my experience most people go with what has worked best for them in the past. As I travel around the country and visit manufacturers who have used mist collection, it's not unusual to see a variety of different kinds of mist collectors from different manufacturers in the same building. Was it a case of "that didn't work, try this" or was it the flavour of the week?

There's a variety of mist collection equipment available: media, centrifugal and electrostatic precipitators being the most popular. The question is what works best for "my" application. There's not an easy answer to that, however. Each application can be different; different cutting oils, pump pressures, materials, speeds and feeds, and cavity size all can play into what will do the best job. Then you have to decide on how much maintenance do you want to endure. There are media filter style collectors that will need to be serviced a few times a year, and other media types that have long life filters that don't require as frequent a service interval. There are centrifugal separators that require periodic pad replacement and could require drum replacement if they go out of round, causing the machine to vibrate which may transfer to the machining center. As for electrostatic precipitators, they require periodic cleaning to maintain peak efficiency.

In my mind, for most mist applications, especially those with high pressure mist, electrostatic precipitators work well. I've seen applications where a double pass or triple pass electrostatic can handle up to 2,000 psi with oil or water soluble coolants. Even very light oils for high speed grinders are collected effectively with an electrostatic.

Mist collectors to consider

Here are some mist collectors to consider: Electrostatics can also be effective on

smoke, but there may be applications, like heavy hogging, where a post filter may be considered. Check with the manufacturer before applying one to this application. Another application that electrostatics seem to do well is on EDM smoke. There are many sinker and wire EDM applications where you can draw the smoke over the bed of the dielectric fluid and collect it effectively. If you're using kerosene fuel as a dielectric, caution should be used with any collection device, but I hope you're not using kerosene. Depending on you dielectric, there can also be an odour that gets released. Many collectors have a carbon after filter option that can solve that problem.

Bag collectors will work with low pressure applications where pump pressures are in the 50-200 psi range. Higher pressure applications may require multi-stage filters for maximum efficiency. I have also seen bag type mist collectors work well on Blanchard type grinders, so long as you can capture the mist. The collection hose needs to be draped over the guard in many instances, but it can be accomplished.

Some bag collectors to consider.

Long life mist filters generally have a fairly high efficiency but still may not "get it all", and need a post filter. One manufacturer

makes their systems with a standard HEPA post filter which makes them expensive to buy. Replacement filters, when they come due for replacement, are also very expensive.

The bottom line is that for any mist collection application, there may be several ways to solve the mist collection issue. Make sure to touch base with a qualified distributor if you're unsure which way to go.

UK Distributor:
Brown & Holmes Ltd
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www.brownandholmes.co.uk

The stand-alone benchmark for filtration

At-source capture of dust and fume should always be the primary control mechanism for the protection of a workforce and to ensure a clean working environment, but despite best intentions at-source capture is not always possible or sufficient. That is why Nederman introduced its impressive MCP-16RC Air Purification Tower.

This innovative stand-alone unit is the ideal complementary solution for eliminating airborne particulate and welding fumes that at times evades even the most effective at-source capture. Utilising state-of-the-art computer simulation packages and years of experience on mainland Europe installing similar room cleaning equipment, Nederman has created the industry's most innovative and efficient system for removing secondary airborne welding fumes from the workplace.

The MCP-16RC Air Purification Tower is ideal for production facilities where ducting cannot be installed, where very large fabrications are being welded or where capture at-source isn't practical. Additionally, for employers conscious of the overall working environment, the MCP-16RC can be installed to complement at-source capture systems.

In terms of operation, contaminated air is first drawn into the unit at low level. It then passes through the high efficiency filtration section containing sixteen patented Uni-Clean filter cartridges, before clean air is blown back into the workshop via sixty adjustable nozzles in the upper outlet plenum. By blowing air directly into the 'fume blanket' that sits at a height of 4-5 m above the workshop, the MCP-16RC disrupts the natural resting point of welding fumes above the workplace floor and recirculates them through the unit. The sixty high-speed ejection nozzles at the top of the unit allows Nederman's Air Purification Tower to achieve unmatched reach, allowing the user to install few units to cover a large area. Not only that, but because the air is blown at a height of approximately 5 m, annoying drafts at low level are minimised.

With a built in fan the MCP-16RC only requires power and a compressed air supply to operate. Filter cartridges are cleaned automatically by an energy efficient compressed air pulse-jet system, activated by an integral electronic controller.

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50 percent increase in extraction area

AirBench has announced the release of a larger version of its highly popular FPW welding and grinding bench.

In response to customer requests, the new FPW269084 is 600 mm longer, providing and overall area of 2,550 x 960 mm and a ventilates area of 1,800 x 600 mm. This represents a 50 percent increase in extracted area over the previous model, allowing for larger workpieces and processes.

AirBench FPW is designed for production level welding and grinding, generally on mild steel and similar materials. Both sizes use energy-efficient EC fans and operate from a standard 13 amp single supply. Grinding dust or weld fume is drawn downwards through the ventilated surface and filtered, before clean air is returned to the room. As with all standard AirBenches, no installation is required.

The FPW269084 is available for customer visits at existing user sites in the South East and North East, with additional sites to follow.

For more information, to discuss your application, or to arrange a visit with a demonstration unit, contact:

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Aberlink makes light work of inspection

Sevenoaks, Kent-based Underwater Lights Ltd designs and manufactures high quality lighting solutions for yachts using the latest LEDs and electronic components. The quality of the company's underwater LED lighting means that it is now recognised throughout the world as a leader in this challenging sector.

After gaining Lloyds Register approval for the BULLEYT underwater light in 1991, the company's first successful product was superseded by the popular UL Ti MATE range of underwater Lights in 2004. Further development and expansion has ensured that the now comprehensive, advanced UL Ti MATE range continues to be the most efficient such lights currently available.

Peter Urquhart, director and designer for Underwater Lights Ltd, explains: "We have fitted more than 15,000 lights world-wide over the past 25 years and are proud of the fact that many of the world's most luxurious superyachts are fitted with our products.

"We have developed a comprehensive portfolio of lighting solutions for both the interior and exterior of superyachts and work closely with owners and designers throughout the world to ensure the delivery of both standard and bespoke lighting systems. So successful have our designs and innovations been, our lights are often copied, although never replicated or bettered."

Although many of the company's competitors outsource their manufacturing, to help guarantee the continued premium quality of its products, Underwater Light Ltd boast its own high-tech manufacturing facility that is equipped with modern CNC machine tools. This autonomy allows closer control of production and improved levels of quality control throughout all manufacturing processes.

Given the extremely harsh environments Underwater Lights products are used in, the company oversees a rigorous quality control regime. In addition to strict goods inward checks and continuous in-process production monitoring, each finished product undergoes a meticulous final inspection routine. To ensure the continued quality of the company's output Underwater Lights recently invested in an Xtreme coordinate measuring machine from Aberlink.

Peter Urquhart says: "All at Underwater Lights pride ourselves on the premium quality of our products, we also understand that, in addition to the innovative nature and exceptional performance of our lights, our reputation has been established through our outstanding quality standards. To guarantee the water-tight integrity and longevity of our assembled products, each of their individual elements have very demanding dimensional tolerances, therefor we apply meticulous levels of inspection to all of our components.

"The most important elements, related to creating the desired water-tight seal in our underwater lights, are two very accurately machined mating, tapered parts. To ensure there are no dimensional inaccuracies or differences in geometries in these two tight tolerance components they undergo the most meticulous of inspection routines.

"As our ever-increasing manufacturing output had begun to place a strain on our existing inspection facilities, we recently searched for a fast and accurate means of inspecting our components, including our mating tapered parts. Having considered a

couple of alternative options, a demonstration of Aberlink's advanced new CMM convinced us that the machine was the ideal answer to our inspection problems.

"The recently installed Aberlink Xtreme has proven very easy to use and has further reduced our already low scrap levels. The machine's accurate and speedy measuring routines are now giving instant feed-back to our production department and helping to ensure the continued premium quality of our lighting systems."

Having caused quite a stir when launched at the MACH 2016 exhibition, the Xtreme has proven to be an instant success, so much so, Aberlink's manufacturing facility is now working flat-out to keep pace with both UK and overseas demand for this unique coordinate measuring machine.

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

As the inexpensive Xtreme requires no compressed air and has the shortest learning curve of any equivalent system, just one day without prior CMM experience, the robust CMM represents an ideal 'plug and go' solution. In addition, the Xtreme's integral temperature control function ensures that accuracy is maintained even when the surrounding ambient temperature is not controlled.

Ensuring greater user productivity and profitability, the Xtreme utilises Aberlink's 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. In essence this 'smart' software represents an intelligent measuring system that is able to automatically recognise and define the various features being measured. Aberlink 3D is claimed to be the easiest to use and most intuitive CMM software currently available making it ideal for use by both quality and production personnel.

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

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FARO Gage aids AJT Engineering quality

Since being established in Aberdeen in 1948, AJT Engineering Ltd has developed into a renowned provider of multi-discipline engineering services to a broad cross section of industrial sectors.

In addition to undertaking a wide variety of other work, today AJT Engineering Ltd specialises in the repair of surface and sub-sea drilling equipment, blowout preventers, drilling and production tubulars, in addition to new equipment manufacturing.

In the 60 plus years since the company's formation, AJT Engineering Ltd has become one of Scotland's leading subcontracting engineering organisations and now embraces three distinct, but closely co-ordinated, divisions comprising AJT Engineering, British Heat Treatments and British Metal Treatments.

AJT Engineering Ltd's head office and two principal engineering facilities are located close to many of its major customers in Aberdeen. With a total site area of five acres, the company's impressive capacity and wide range of capabilities are unrivalled in the North East of Scotland.

AJT Engineering's extensive workshop floor area of 70,000 square feet is serviced by 12 overhead cranes. The company's comprehensive production facilities include a wide range of both conventional and CNC large capacity machine tools, enabling customers' machining requirements to be carried out efficiently and economically using the most appropriate resources.

A major factor in AJT Engineering's continuing success is the company's all-embracing quality ethos. An attitude of 'right first time' manufacturing and a philosophy of seeking continuous improvements influence all of the company's production activities.

In addition to employing dedicated measuring instruments, given its renowned accuracy, flexibility and portability, AJT Engineering make constant use of a FARO Gage portable CMM throughout the company's impressive five acre Aberdeen site and busy workshop.

Alasdair Purvis, technical support at AJT Engineering Ltd explains: ''Despite the current recession hitting manufacturing companies involved in the North Sea Oil & Gas sector, we are continuing to enhance our existing CNC machine shop capability, as illustrated by the recent acquisition of four advanced CNC machine tools.

"In fact it was a previous investment in modern manufacturing technology that motivated the purchase of our FARO Gage portable CMM. Prompted by increased levels of output and the need to preserve and further develop our measurement and inspection capabilities, we searched for a suitable measuring technology.

"Due to the size, complexity and precision of many of the parts we need to measure, we knew that our search would not be an easy one. In addition, given our need to undertake measuring routines in all areas of our vast site, and also our requirement to occasionally take accurate measurements of complex components off-site, the chosen technology needed to be easy to use, robust and portable.

"Having examined several alternative systems, and been impressed by its advanced capabilities and ease of use, we purchased a FARO Gage measuring arm, and following a short training session our operators became skilled in the Gage's use. Our FARO Gage is now used across a wide range of both in-process and final inspection situations.

"Although, it is in 'on-machine' situations that our FARO Gage really comes into its own. In addition to being a time consuming and costly exercise, it is almost impossible to remove a partially machined component from a machine tool, take the required measurements then replicate its original location to enable further machining to take place. Our GAGE has proved invaluable in this area. Now, due to the instrument's sturdy construction and portability we are able to measure parts in process, whilst they are still located in the machine tool. This allows us to prove the machine program on the machine rather than at latter inspection. Our increased use of on-machine inspection has resulted in several major advantages, including less machine tool down-time, reduced scrap levels, less re-work and faster delivery times.

"Due to the diversity of our work, the flexibility and adaptability of the FARO Gage has also proved invaluable in enabling

complex and accurate final inspection routines to be undertaken."

The ingenious FARO Gage measuring arm is an easy-to-use, fast, accurate portable CMM that ends companies' reliance on expensive and inflexible fixed CMMs. The FARO Gage offers high accuracy levels, improved measurement consistency and reduced inspection times. In addition, following a measuring routine, the FARO Gage is able to automatically generate user defined inspection reports.

Designed and constructed specifically for use by shop floor personnel, the robust user friendly FARO Gage can be set up in seconds, allowing both skilled and semi-skilled personnel to measure parts and assemblies easily, quickly and most of all accurately.

The FARO Gage's advanced design maximises accuracy by allowing users to maintain their focus and to achieve quality results. Internal counterbalancing limits user fatigue, whilst built-in temperature and overload sensors allow the FARO Gage to detect and react to change.

As a single, multi-use, accurate tool, the FARO Gage saves both time and money and brings an end to disorderly inspection areas cluttered by numerous traditional dedicated measuring instruments, such as calipers, height gauges and micrometers.

The FARO Gage enhances productivity by completing faster and more accurate measurement routines. Features such as a spherical working volume of 1.2m (4 ft.) and accuracy up to 0.018 mm (0.0007 in.) provide performance comparable to a fixed CMM, but with previously unimagined levels of flexibility and portability.

The FARO Gage is ideal for quality control tasks such as first article inspection, GD&T (Geometric Dimensioning and Tolerancing) and for exporting dimensional data for SPC (Statistical Process Control) analysis. Further speeding-up measuring routines, FARO's intuitive metrology software helps GAGE users to quickly create custom routines for repeat part measurements.

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Innovations in Measurement Data Processing

MoveInspect version 7

With a new calibration method, more interfaces and a redesign of the user interface, the latest version 7 of the MoveInspect software offers a lot of new features and user-friendly benefits. With both fixed reference field and scale bar calibration, large-scale measuring volumes are now calibrated with the highest precision possible. The new method "reference field and object" is especially suitable for multiple camera arrays, i.e. AICON's 3D Arena, and allows for considerable increase of accuracy.

Working with Dynamic Referencing is even more comfortable than before. Users can now create multiple references and can easily switch between them. In addition, the automatic exchange and actualisation of existing sets of reference points within the measuring process are possible.

The latest MoveInspect software version works with the new high-resolution HF4 cameras, applicable for dynamic measurements of up to 1,000 Hz. Before starting the project, the available memory space is checked, and the user gets a warning in case of too low capacity. Additionally, MoveInspect is now able to read the measuring results of IES tilt sensors and data recording modules of third-party suppliers and to share the information with the analysis software. Measuring results of either MI.Probe or active probe can directly be transferred to Microsoft Excel.

The look and feel of the new software version is very clear and well structured. The single menus are arranged more neatly and changing between different menus is much easier - process and cost optimisation at its best.

Licensed customers with a valid software maintenance contract will automatically receive the new MoveInspect Software version 7 with the next software update.

New PrimeScan

An attractive entry-level solution for highly precise 3D digitisation, the new PrimeScan scanner line provides an attractive entry-level solution for highly precise 3D digitisation of industrial components. It works with the renowned AICON OptoCat software and thus uses the same algorithms

for fast creation of highly precise point clouds with highest data quality as the high-end scanner lines StereoScan and SmartScan.

PrimeScan has a compact design: the base area equals a DIN A4 sheet, and the scanner weighs only 3 kg. The working distance is short and is therefore suitable as a desktop solution and for applications under cramped spatial conditions in industrial surroundings. Measuring fields between 50 mm and 1,000 mm are available. Depending on the required resolution and precision, different camera resolutions are available: two, five or eight megapixel.

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Subcontractor takes the plunge with hyperMILL

The path to setting up a subcontract machine shop couldn't have been more obscure than the tale of Ben Goodwin. Three years ago Ben Goodwin was well remunerated for his dangerous skills as a deep sea welder and fabricator, but realising the danger and relatively short life expectancy, he quit the day job, bought a machining centre and set up BRG Developments.

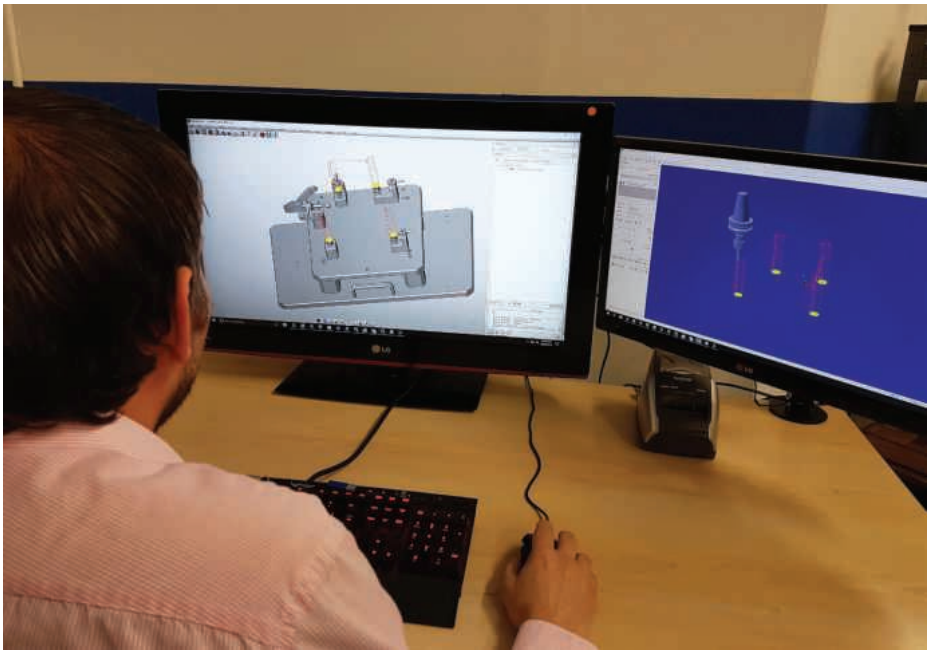
With little experience in a machine shop, the odds were stacked against Ben Goodwin, who at the young age of 25 went out and bought a Hurco 3-axis VM10 machining centre and a suite of low-end CAM software. Taken on a massive learning curve, the small business owner is now making a huge success of his business venture and this is credit to his vision, drive and also the subsequent help of OPEN MIND CAM software. Ben Goodwin explains: "I bought the Hurco and a 3-axis CAM package and even with my limited machining knowledge at that time, I quickly realised the first CAM Package I bought was holding me back. The 3-axis software was slow, laborious and despite my limited experience, I was getting frustrated with the tool paths. I needed to upgrade and hyperMILL® was the only long-term choice for my business."

As an extremely ambitious business owner, Ben Goodwin has his sights set upon building major success and OPEN MIND's hyperMILL software is a core aspect of this vision. As Ben Goodwin says: "Realising the previous CAM software was unsuitable, I did my homework on the vendors, watched YouTube videos and eventually bought a seat of hyperMILL at MACH 2014. hyperMILL is the most capable, user friendly and prestigious 5-axis CAM package available; so finding it very competitively priced was another huge bonus.

The ambition and vision of BRG's owner is evident in his software selection, opting for the leading 5-axis CAM package when only having a 3-axis machine. Alluding to this, Ben Goodwin says: "Despite only having a 3-axis VMC, our business has huge ambition and we will be moving to 5-axis machining in the near future. When we get there, we will be prepared with experience on the leading 5-axis CAM package, which will reduce our learning curve. In addition, hyperMILL is a modular package, so we can add what we need as we progress."

The learning curve

When the Lloyd's Register ISO: 9001 registered BRG was setup, Ben Goodwin had no concept of M or G-codes on a CNC machine, diving straight into machining with CAM software. He remarkably still has little understanding of conversational programming. Ben Goodwin says: "Our very first job was machining and drilling simple side-step plates for ambulances, but my ambition was to progress to high value added complex work. We are now realising this reality by machining complicated automotive mould tools, aerospace engine components and even intricate medical parts. None of this would have been possible without hyperMILL. I see conversational programming as something for producing simple parts or as a learning suite for apprentices whilst hyperMILL is the marquee package for producing everything from simple 3-axis to full 5-axis parts." Justifying the 5-axis package for a 3-axis machine.



The selection of hyperMILL by the Market Weighton based company is more than just ambition. Ben Goodwin explains: "Our selection of hyperMILL is justified in the results from the first couple of jobs we did with the package. One of our first hyperMILL jobs was to produce a trophy for the 'Best-in-Britain' Hot-Rod competition. The complicated trophy had a programming time of four days with a machining time of 29 hours with our previous CAM suite. With hyperMILL the programming times were slashed to two hours 30 minutes and just nine hours for the machining using the same tools.

"On a family of P20 steel automotive mould tools for water-pump parts, we cut programming times from four hours to just 20 minutes. The machining time was previously nine hours for each of the four tools, 36 hours total, and the tool paths of hyperMILL allowed us to machine all four tools in just one hour 40 minutes. We realised the previous CAM package was limited, but we never knew how impressive OPEN MIND's hyperMILL would be."

The optimised tool paths and strategies of

hyperMILL has drastically reduced non-cutting times and the software enables the Yorkshire subcontractor to maximise the capabilities of its SGS solid carbide end mills and Chick One-Lok vices to truly drive productivity gains.

The difference with hyperMILL

For BRG the simplicity, safety and ease of use is built into almost every feature of hyperMILL. Ben Goodwin says: "Our previous system and many other 3-axis CAM packages are 32-bit operating systems that are slow to calculate and process information. hyperMILL is a 64-bit system that churns through the data at lightning speed to reduce idle times and speed up programming times by at least 80 percent compared to our previous package."

The speed of calculating data is matched by hyperMILL features that slash programming times for the end-user. This includes the ability to use multiple work planes whereas alternate systems have one fixed datum point.

Safety is a critical factor for BRG and the collision detection on hyperMILL is faultless. Ben Goodwin says: "The hyperMILL collision detection is unparalleled and this is underpinned by the comprehensive tool database system that allows us to put the tool holder, collets and the drills or end mills into the database. This gives us a complete picture of our setup and the tool overhang, which works in conjunction with the collision detection feature to give us complete confidence that we won't crash our machines."

Adding to this confidence is the new MAXX machining high performance package within hyperMILL which also has enhanced features such as arbitrary stock roughing that allows the customer to define exactly what features they wish to machine and the step-over parameters. Ben Goodwin says "We are using most of the new features at present and we're tentatively trying hyperMILL MAXX machining. As a company we are delighted with hyperMILL and the support from OPEN MIND has been first class. The package has put us way beyond our competitors in terms of turnaround times and also our ability to manufacture extremely complex parts. The ability to machine complex geometries on a 3-axis machine has put us in a great position with Tier 1 and OEM manufacturers, which wouldn't have been.

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Radan 2017 heralds the start of major engineering functionality

The 2017 release of the world's most powerful sheetmetal CADCAM software, Radan, paves the way for the most exciting developments in the software's history. Product manager Olaf Körner says: "We are on the verge of reorganising how manufacturers will be using Radan in the future, and important updates to Radmanager in the new edition are the first steps towards this."

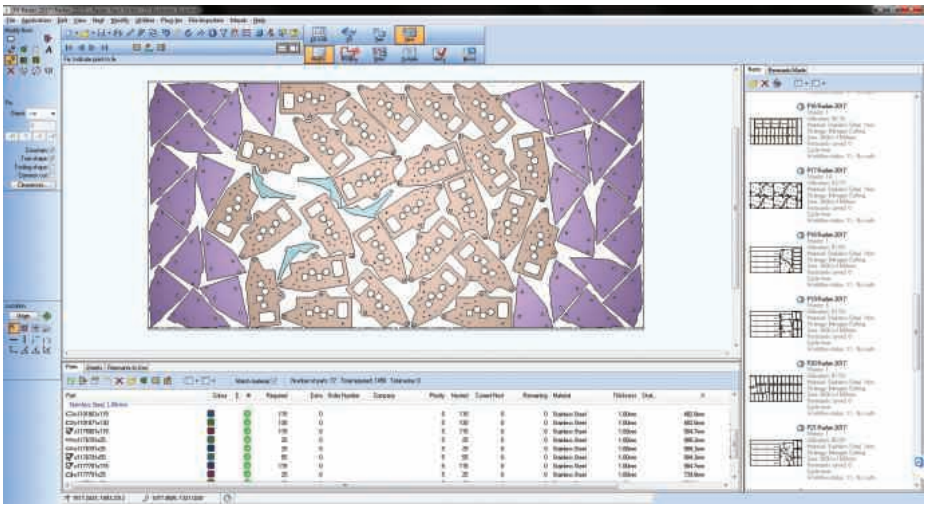
Developers are working on separating Radan into two distinct aspects; first, traditionally creating NC code to drive CNC machines, and second, what they call "engineering of parts."

Radmanager's strength is that it creates nests without the user necessarily needing to know where the parts come from, what the order numbers are, or which customer they are for.

Olaf Körner says: "But to achieve this, it relies on the parts being completely ready for nesting. And that means more than just having flat parts with the right geometry. We need to know as much as possible about the parts, whether they can be cut on any machine tool, and the cycle times for all of those solutions. For example, it may be feasible to cut a part on either a laser or water jet, but while it would take only minutes on the laser, it may take two hours on the water jet.

"In Radan 2017, Radmanager's ability to manage both 2D and 3D engineering of parts is the precursor to the entirely new forthcoming engineering system for any type of parts, including 5-axis laser-cut sheet metal, tubes, flat, and bent."

The forthcoming Radquote, which is now available as a preview will be demonstrated at exhibitions and pilot customer sites ahead of its official launch. Radquote will also rely on engineered parts.



Olaf Körner says: "This 3D engineering of parts is becoming increasingly important. It will enable manufacturers to break assemblies down from CAD systems, into their constituent components, and fully understand everything about them."

2D CAD files can also be imported automatically into Radmanager now, without the need to convert them.

CADCAM updates

Radan 2017 addresses danger of scrap flying off, sliding under the sheet, or damaging the tools on punching machines, by flagging up where floating scrap will occur.

The automatic order style editor now shows graphically what the program is going to do, enabling users to home in on a particular operation to make changes. This is seen as a major improvement on the previous text-based system.

Still with punch presses, Radan 2017 configures machine tools with all available cutting tools, so that new customers have commonly used tools immediately available.

3D

A side panel was introduced in a previous version of Radan which aids navigation around complex assemblies, but there was still a need to travel between the two. A new facility in Radan 2017 allows the user to stay with the model, and to immediately switch between front view, side view, top view etc.

The graphics drawing has been speeded up. As an example, Olaf Körner explains that in earlier releases, deleting all screws in an assembly may take a while after they were selected, but now he says the software will always deliver a quick and consistent frame rate. The 3D function also supports modern graphics cards more efficiently, improving performance on tablets.

The process of updating information between Radbend and Radan 3D has now been automated. Olaf Körner says: "A design is analysed in Radbend, and then the bend information it provides fed back into the 3D model. This used to be a process that the user performed in a number of steps. Now, once the part has been identified, it's a simple mouse click to update the information."

Nesting

Improved algorithms have led to an important enhancement of Radan's powerful nesting capabilities. Olaf Körner says: "Continuous effort is applied to further strengthen the nesting engine to achieve a better fit, and therefore, a potentially better material yield."

With an increasing number of users adopting project nesting, a new reporting engine ensures users can easily customise the content and design of their reports.

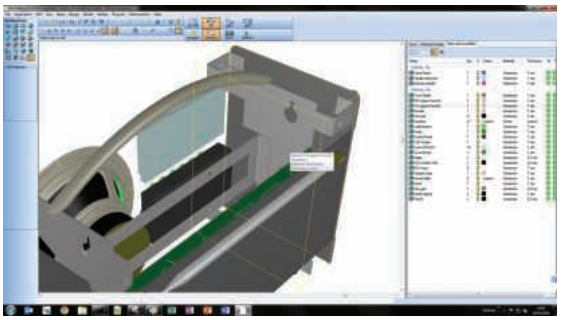
It is also easier now to create nest projects, thanks to the new template function. Olaf Körner says: "Existing project settings can be stored with a given name, and recalled at any time. "Even creating nest

projects for the same machine tool sometimes required repetitive work, but now everything the user needs will be there, saving quite a number of steps."

Profiling
Autotooling routines are now more efficient in placing tags, or microjoints, for common cutting.

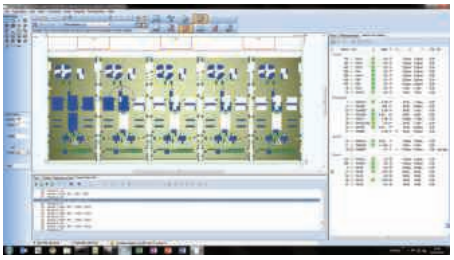
The foil cutting function has been extended to scrap, ensuring that where sheets are covered with a protective foil for laser cutting, clean cuts can be made for scrap, too.

Radbend
Radbend now highlights where holes are at risk of deforming by being close to bends. Also, the operator can switch between design and result values. For the first time, the user can now check with different maximum allowed force for the pre-bend and the hemming operation done with same tools.



Improved communication between 3D and 2D parts ensures that Radbend can now link to the 2D flatblanks created by Radan 3D. It also means that with more information going to the flatblank, 2D bends can easily be seen – the tooling and sequence number, as well as the radius, angle and setback.

Also, Radbend now supports the new user interface, Touchpoint TruBend, which combines the advantages of multi-touch technology with industrial control…as all Trumpf pressbrakes will move to this state-of-the-art controller.



Radtube
While Radtube has traditionally been used for simply cutting tubes, it can also program any extruded shape for tube cutters, including I-beams, H-beams and C-beams, along with L-shaped profiles.

Summing up Radan 2017, Olaf Körner says the items of new and enhanced functionality provide immediate improvements for sheet metal manufacturers, while underlining the intention to continue investing heavily in the software.

Olaf Körner concludes: "Developing Radan to engineer and fully analyse parts in this way is the biggest step forward we've ever taken. The future is very exciting, as the level of automation we'll be able to achieve is phenomenal."

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Improved performance for high temperature castings buyers

Following the installation of a CNC pattern making system, high temperature castings suppliers, Wallwork Cast Alloys, has slashed the lead time for deliveries. Down from a maximum 18 weeks, bespoke new casting designs can be delivered in as little as two weeks. The increase in speed with which patterns can be made has also reduced the initial cost, making smaller batches of castings more economic and reducing the cash tied up in stock.

The Wallwork foundry makes the baskets, trays and fixtures that they use in their own high temperature heat treatment and vacuum brazing operations. The company also offer this service to other manufactures in hot trades. High strength castings, with low mass, permit target furnace temperatures to be achieved quickly for faster cycle times using less energy. Understanding this means Wallwork can develop more economic and efficient designs that use material economically but retain strength in key areas.

The CNC pattern manufacturing process starts with SolidWorks, a software package that creates a virtual 3D model that can be visualised from any angle. Once the design has been optimised this is converted by the CADCAM software into a digital file that is transferred to the CNC milling machine. Working with medium to high density resin board, the machine then mills away all excess material to create a single-piece precision pattern that the foundry can use again and again.

Foundry manager Alex Beck says: "With the new machine we can respond quickly to customer needs, be more flexible and even more competitive. Patterns made by this method have a good working life, but all designs are stored digitally so we can easily replicate patterns or make modified designs if needed."

A new brochure is available to guide buyers of high temperature cast alloy furnace furniture and more information can be found on the Wallwork website at **www.wallworkht.co.uk/content/heat_resistant_castings**.

The Wallwork group employs approximately 250 people offering a comprehensive heat treatment and hard coating service to the manufacturing industry. Sites are open 24 hours per day, seven days per week and operate a fleet of 40 commercial vehicles.

In recent years the group has invested extensively in new equipment and training in order to offer a high quality, competitive service to the aerospace, motorsport and medical industries.

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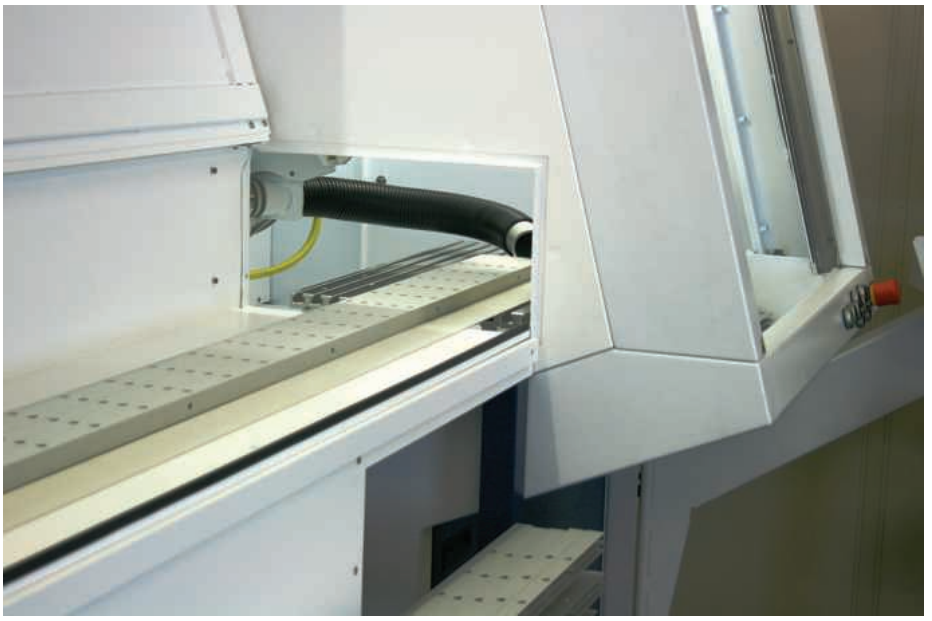
Added value with TRUMPF marking solutions

TruMark laser extends portfolio of services at Broxton

Broxton Industries, a Cirencester-based market leading provider of subcontract manufacturing services, is reaping the benefits of a recently installed TRUMPF TruMark laser marking system. The company, a long-time advocate of TRUMPF technology, initially acquired the TruMark Station 5000 with TruMark 5020 laser to fulfil an order for marking 2 m long anodised aluminium extrusions. However, in the eight months since installation, Broxton is successfully filling the machine's capacity with a raft of newly acquired work.



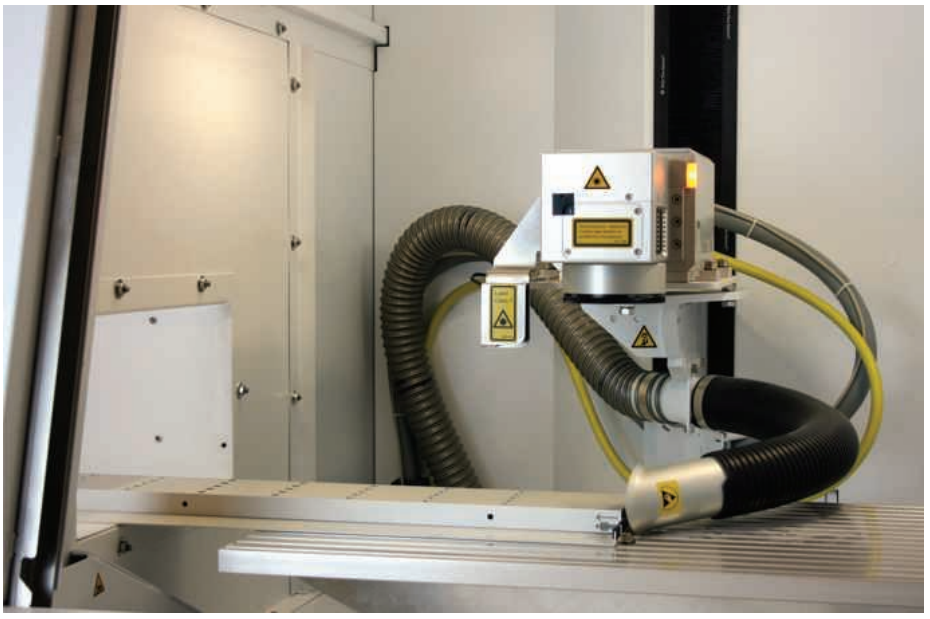
Formed in 1973, Broxton has grown to be one of the UK's most successful subcontractors by offering value-added services and world class production capacity. The 60 employee company has two divisions, CNC machining and sheet metalwork, which serve many sectors including, audio, lighting and electronics, aerospace and military.

Broxton's goal is simple: to help its customers compete successfully in their markets and support their needs with technical expertise and professionalism. With this in mind, when the company was at a customer meeting in December 2015 discussing the potential to laser mark and brand extruded products, managing director Marcus Ellams had an idea:

"Immediately I began to think that if we invested in the right marking technology we would not only complement existing processes, but it would also enable us to add more value and most of all, provide a solution to an important customer,' he says.

With an array of successfully deployed TRUMPF machines already in use at Broxton, including three punching machines, a laser cutter and four press brakes, it was logical to approach TRUMPF regarding its new laser marking requirement.

"Our client had been considering various other laser marking suppliers, but as a satisfied TRUMPF user, this was our natural choice," says Marcus Ellams. "Furthermore, the TruMark system offered everything we required in terms of its software, power and range of applications."



There was only one hurdle to overcome, the length of the extrusions in question were 2 m, far too long for most laser marking systems to accommodate.

"Unlike other systems, the TRUMPF TruMark Station 5000 had removable panels on both sides, which gave us an idea," he continues. "We could develop a bespoke side extension to provide an ergonomic and productive access point for loading long material. With the help of TRUMPF engineers, we integrated it with the safety circuit, which is vital when working with a Class 1 laser. We now have hinged access for our long extrusions with a safety interlock, which works really well. This unique adaption has increased the flexibility of our machine to accommodate a wider variety of parts."

The 2 m long anodised aluminium extrusions are processed in batches of 1,500 at Broxton. Each extrusion, which is destined for the furniture industry, requires three marks at one end; two logos and an instruction.

"The TRUMPF marking software is great as it allows the use of sequenced marking programs," says Marcus Ellams. "As a result, we can also perform automatic serialisation for aerospace and military work, where traceability is of paramount importance."

Since installation, Broxton has been successful at filling capacity on its new TruMark system with a plethora of different jobs, including laser engraving stainless steel fascia plates for a customer in the fire safety sector.

"Beyond metallic jobs, we've also marked plastic and even painted finishes," he continues. "In fact, we've not found a job that it can't do. Before investing in this technology we would have missed out on these opportunities, or had to engage with a subcontract supplier. As a result, I am expecting quite a short payback period."

The power of the TruMark 5020 laser and its high pulse frequencies enable fast processing speeds and short marking process cycles. Thanks to MOFPA (Master Oscillator Fiber Power Amplifier) technology, the pulse durations of the TruMark 5020 can be adjusted to meet the exact application requirements. Thus, even temperature-sensitive parts can be marked with ease.

"The TruMark system delivers high quality, cost-effective branding and marking, and complements our screen printing capabilities," concludes Marcus Ellams. "We get a good choice of repeatable finishes, while the power and speed are both first class. In addition, the support from TRUMPF has been excellent. We had to complete a sample approval process with our extrusion customer and TRUMPF proved to be a big help. Their post-installation support has also been very good when we've needed assistance on specific jobs. This is important because we have very discerning customers with high expectations. However, with our attention to detail and investment in the latest technologies, we are able to meet their demands day-in, day-out."

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New generation of embedded controllers

Pryor Marking Technology is launching a new embedded controller for its successful range of dot and scribe marking machines, portable, benchtop and production line integration models, with a whole host of added advantages.

In addition to the PC-based software package, the new 4000 series embedded controller links with the exisiting range of high quality precision marking machines and, according to PRYOR, sets its marking solutions head and shoulders above other similar products in the market place.

The design and build of this new system, all developed in house at Pryor, creates a controller which is dedicated to the Industrial sector and straightforward to use, it combines all the necessary functionality and design features, to ensure a long and robust life in difficult environments.

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

The company has grown to become a single source supplier, offering a complete portfolio of solutions for permanent part marking; ranging from a simple hand stamp through to turnkey, bespoke designed systems with multi-axis computer-controlled marking heads, machine vision and traceability software.

The alternative to using this newly launched embedded controller is Pryor's own PC -based software suite, which brings with it the capability for full traceability in manufacturing processes. This is vital for securing quality outputs and which can be used in almost any manufacturing environment.

Identification and traceability

Manufacturers have always wanted to prove their products' authenticity, quality and origin. Pryor is justifiably proud of the part it plays in identifying billions of products around the world.

Reducing quality escapes, recall costs and production inefficiency via unique part identification is critical in manufacturing today.

A unique ID can be recorded in many different formats. Pryor has many options on offer to enable all manufacturers to ensure that they have the capability to optimise their production processes:

Modern vision tools can read and log human readable text ("Optical Character Recognition" or OCR; traditional barcodes can store a line of numbers to find an entry in a database; RFID tags can communicate large amounts of data with non-contact readers.

However, the industry standard has become the Data Matrix code. It can carry a large amount of data, even when marked in a very small physical area. Because they can store the same data in multiple ways, Data Matrix codes can withstand significant damage while remaining readable. Whatever the format, however, an important feature for traceability is that the ID is completely unique and is applied to the part in a permanent way, be it laser etched, dot marked or engraved. Ink can rub off, labels can be removed, to ensure full life-cycle identification and recovery of manufacturing data the ID needs to be as long lasting as possible.

With a unique and permanent ID, production processes can be controlled, manufacturing data collected and components traced and recalled. This saves money, reduces waste and improves customer relationships.

Once a manufacturer has recognised that they require a unique Id to assist with optimising production, Pryor can look at each of the four elements and ensure that the client has the best solution available to achieve the goals required.

The four elements are: process control, data capture, production monitoring and life-cycle traceability.

Process control

The key element in process control is operators. Human error remains the most significant cause of quality escapes in manufacturing. One approach to reducing these quality escapes is automation, and fully robotic, vision guided marking systems are provided for that reason. They can identify a component, select the relevant marking data and layout and place it automatically in the right place. No operator is involved in the process.

In the case of processes on a single component, a unique ID should be permanently applied to the component. If every process requires a scan of the ID prior to initiation then it can be ensured that no steps have been missed, performed in the wrong order or under incorrect parameters. For example, perhaps a process needs to be completed within a certain timeframe, or in certain ambient conditions. This input data can be used to prevent a process from starting.

When it comes to assembly of components into a finished product, if every component has a unique ID, then scanning

each prior to its assembly ensures that nothing is missed and assembly is made in the correct order.

Data capture

While process control is about preventing errors, the implementation of a unique ID on every component and linking them to manufacturing data provides an additional, powerful tool.

The data can be stored, quickly building up a significant bank of information about production processes. This "Big Data" can be used to improve efficiency and productivity, identify trends and highlight problems.

ID scans at specific, regular points in the production process automatically log cycle times and can be matched to production parameters, e.g. ambient temperatures, shift numbers, operator ID. The list and quantity of data is never ending.

Reports can be generated for individual components, or for each process step, considering numerous parameters. Trends can be studied and production improvements proposed. The impact of improvements can be monitored and checked.

Production monitoring

Analysing Big Data to improve production processes is one thing, but flagging up bottlenecks and issues in real time means that prevents problems occurring in the first place.

If unique ID scans are already being performed throughout production, for reasons of process control, traceability or data capture, then it is a much simpler step to add on production monitoring. Settings are made for each process and if scans are not happening at the specified rate, frequency or intervals, flags can be set and alarms raised.

Life-cycle Traceability

One of the most powerful benefits of a unique ID is that of traceability.

No matter how many components there are in your product, they can all be uniquely identified with a Data Matrix code. This means that at any point in the product's life-cycle (either before it leaves the production facility or after years in the field) any component can be scanned and a full production history instantly recalled.

This gives huge savings in fault finding, with the ability to examine everything that

happened to that component in your facility and under your responsibility. Even when parts are replaced in service, the database can be updated with a new scan.

The data attached to an ID can be any format. A video log of the actual production process, a still image of the product at the time of production and test results are also logged in the part history.

Pryor constantly develops and improves its solutions to ensure they match client requirements and is proud to be at the forefront of manufacturing technology.

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New compact LMWS laser marking workstation

Perfect benchtop operation and designed for lean manufacturing

Amada Miyachi Europe has announced its new LMWS low-cost Laser Marking Workstation, specifically designed for benchtop operation. A major facelift to Miyachi's LMW2020 and LMW2030 marker workstations, the LMWS features a fresh design, available as an operator-safe Class 1 or open Class 4, with improved functionality. Designed for lean manufacturing, LMWS offers the widest range of marking capability in its class.

The versatile and easily configurable LMWS is ideal for marking metals, ceramics, and many plastics, and also has cutting, drilling, and welding capabilities. Requiring only minimal workspace, the updated unit is perfect for low volume production and research and development environments in the automotive, medical, aerospace, electronic components and battery industries. Although the design has been modernised and several features added, the new LMWS is available at a reduced price point.

Standard LMWS models are powered by Miyachi's popular 10-50W ML fibre laser markers and use the same graphic user interface for easy transfer from prototype to production phase. Although separable from the base LMF, the two machines are designed to function as one unit.

The fast and precise motorised Z-axis and rotary stage make for easy adjustment of part and focus. The spring loaded manual door opens for easy 270 degree access to parts and tooling, and the large viewing window allows for easy mark monitoring. The LMWS is equipped with F-Theta 100 mm, 160 mm and 254 mm lens options for marking various parts and sizes. The LMWS features an optional compact motorised rotary for marking cylindrical parts, as well as an optional programmable Z-axis.

Amada Miyachi Europe is a leading manufacturer of equipment and systems for laser welding, laser marking, laser cutting, resistance welding, hermetic sealing and hot bar reflow soldering and bonding. It

customises its products around specific micro-joining applications for all its customers around the globe. Amada Miyachi Europe product markets include medical devices, battery, automotive, solar industry, electronic components and aerospace. It is an ISO9001 certified company.

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Digitisation and connectivity to the fore at EuroBLECH

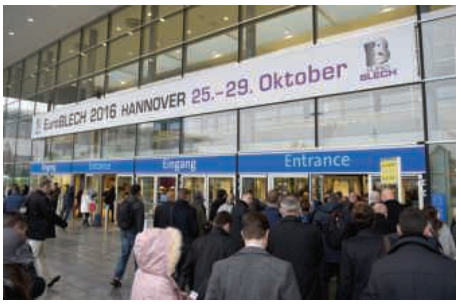
Roger Barber reports from Hannover

The 24th International Sheet Metal Working Technology Exhibition, EuroBLECH 2016 highlighted the importance of digitisation and connectivity of the production processes. A total of 60,636 visitors from some 100 different countries came to Hannover to get an overview of the latest technical developments in sheet metal processing and invest in new production equipment. A total of 1,503 companies from 41 countries exhibited at this year's show.

"The trend for digitised manufacturing boosts innovation and business activity in the sheet metal working industry and its leading industry exhibition," says Nicola Hamann, managing director of Mack Brooks Exhibitions, organiser of the event. "The atmosphere at this year's show was filled with an overall fascination about the recent technological advancements and the large number of positive international business contacts.

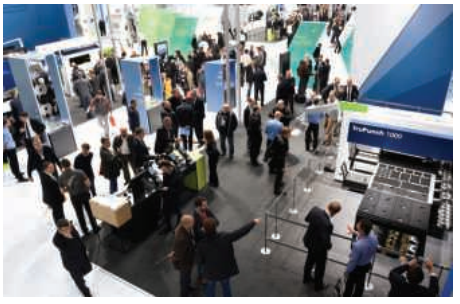
"With an increase of 2 percent in visitor numbers compared to the previous show, this year's EuroBLECH clearly surpassed the 60,000 visitor mark. Not even the strike of two German airlines on the third exhibition day had an impact on the buoyant mood of the participants and the positive development of the visitor numbers. The results of this year's EuroBLECH, a barometer of the industry sector, show a record floor space of some 88,000 square metres net and a sustainable increase in visitor numbers. This demonstrates a healthy economic outlook for the industry sector with its global business activity," she explains.

A total of 39 percent of visitors and 54 percent of exhibitors came from outside Germany at this year's show. This is a further increase by 2 percent each compared to the previous show and represents a record percentage in international attendance. EuroBLECH 2016 saw a major increase in Asian visitors (+30 percent), but also in visitors from EU countries outside Germany (+11 percent). Major visitor countries, next to Germany, included the Netherlands, Italy, Sweden, France, Spain, Switzerland, Austria, Poland, Great Britain, Turkey and India.



A great majority of the visitors came from the industry (80 percent), followed by visitors from workshops, trade and services. Most important sectors the visitors belonged to were engineering, sheet metal and products, steel and aluminium construction as well as the automotive industry and its suppliers.

The preliminary results of the exhibition survey show that both exhibitors and visitors at this year's EuroBLECH were highly satisfied. The visitors praised the completeness and international range of the products on display. The exhibitors praised the qualified and international audience with its high percentage of decision-makers. The



exhibitors also stated that they had met a large number of new business contacts. Three quarters of all exhibitors stated on-site that they intended to exhibit again at the next EuroBLECH, held from 23 – 27 October 2018 in Hannover.

Next year Mack Brooks Exhibitions will organise BLECH India, from 27 - 29 April 2017, in Mumbai. In Spring 2018 the organisers of EuroBLECH will hold Indo Sheet Metal, from 7-9 March 2018, in Jakarta, Indonesia, and AsiaBLECH, from 8-10 May 2018, in Shanghai, China.

The EuroBLECH Awards 2016

For the second time, EuroBLECH put innovative technology and a professional audience in the focus with this year's EuroBLECH Awards. "The New Generation of Sheet Metal Working" was the theme of the awards and the winners were chosen online by the sheet metal working

community. In an official awards ceremony, held in the social media lounge during the exhibition, five prizes were awarded to the following organisations:

In the category 'Factory of the Future,' TRUMPF Werkzeugmaschinen GmbH + Co. KG was awarded a prize for TruConnect, the World of Solutions for a Smart Factory.

In the category 'Original Design' Schuler was awarded for the development of the tools to manufacture the "Planet Earth" 5€ coin, which contains a blue polymer ring.

Start-up company WSoptics received an award in the category 'The Young Generation' for WSweld, a laser cutter which can instantly be turned into a laser welder and back. In the category 'Clean Technology' KEMPER was awarded for its AirWatch, which is a solution to measure ultra-fine dust particles in any production environment using a smartphone or tablet app. Meanwhile, Fraunhofer IPA received an award in the category 'Academic Excellence' for its digital assistance sorting system.

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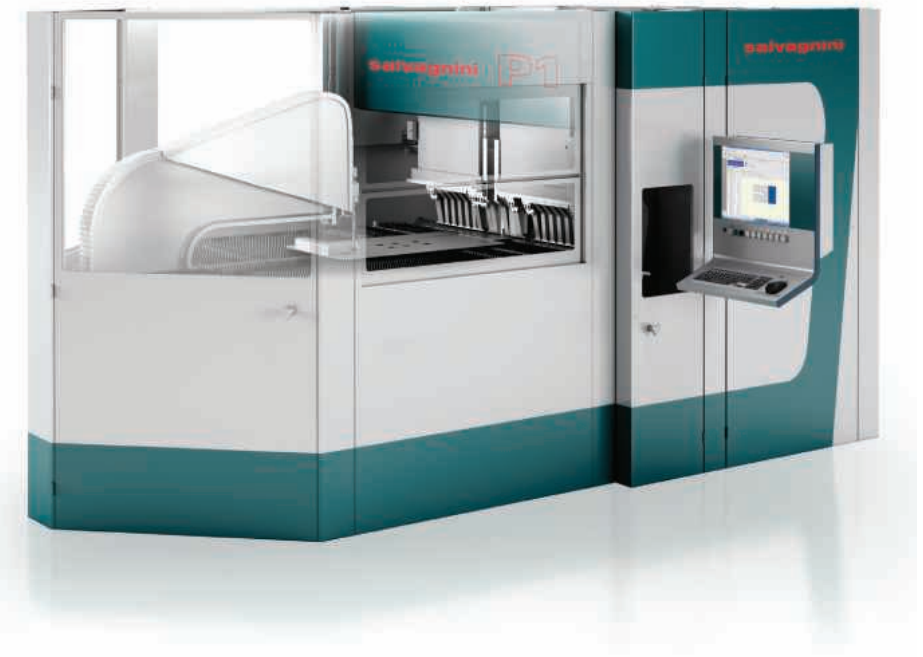
P1: the compact panel bender for Industry 4.0

The P1 panel bender, showcased at EuroBLECH 2016, incorporates the very best of Salvagnini panel bending technology and benefits from the company's considerable experience in sheet metal processing. Now fully automated and adaptive, this panel bender makes a viable alternative to the traditional press brake given its particularly low cost/bend.

Originally conceived as the range's entry-level model, the space-saving, energy-efficient P1, with its high productivity and extreme repeatability accuracy, was presented at EuroBLECH in an enhanced version ready for the new challenges of digitisation laid down by Industry 4.0.



Pierandrea Bello, Salvagnini product manager, says: "Just like the other larger models in the range, the P1 panel bender now features the ABA automatic blankholder and CLAN negative auxiliary blades that effectively boost the machine's already impressive versatility and mean it can process different parts in sequence with setup in masked time."

Salvagnini has actually endeavoured to extend the range of parts that can feasibly be produced on all the panel benders in the range. There are industrial sectors that wouldn't have contemplated a panel bender as a technological solution in the past, whereas they are now opting for this very machine.

With the introduction of the automatic ABA blankholder, P1 has actually become an ideal solution for producing kits as it lets users bend parts that are both complicated and different to each other in sequence. Nonetheless, P1 is still the entry-level model as, even in this automated configuration, the price is basically the same as before, namely affordable to all businesses with a tight budget looking for a smart solution and competitive running costs.

P1, like the other panel benders in the Salvagnini range, implements MAC 2.0 adaptive technology, which means it is not dependent on the quality of the material being processed. In terms of operation, the panel bender measures any variations in the material being processed in masked time and, if these variations turn out to be outside the acceptable tolerance range, they are compensated for automatically by adjusting blade movements, resulting in consistent bend quality even when dealing with variations in the material within the batch and thus reducing waste, even when producing batches of limited quantity.

Now more than ever, P1 is an ideal solution for producing panels of any kind, whether featuring simple profiles or elaborate bends. So much so, in fact, that it makes a viable alternative to traditional bending.

Pierandrea Bello says: "Given the interest we were seeing we conducted a survey of customers who have installed the machine to give users their say and thus get some real feedback from the people using the machine in their everyday operations.

We got some really interesting answers. Apart from the usual benefits you would expect from a panel bender, the factor that everyone identified as the clearest and most unexpected benefit was the rapid return on investment. This is a machine that pays for itself in no time for two reasons: the low initial investment, given that this is a fairly small machine in the end, and the fact that it offsets operator costs. In the former case, the automatic tool change feature means it can do jobs that would traditionally involve using a number of press-brakes with different setups. While in the latter, since part handling is fully automatic, the operator can get on with other things while the machine is working on its own, and this really drives productivity. Moreover, none of this would be possible if we were contending with a standalone press-brake."

P1 makes the bending of panels with a maximum bending length of 1.250 mm and a maximum height of 127 mm possible. It features average power consumption not exceeding 3 kW, silent running and a footprint of less than 8 m^2, a trait that makes it easy to ship and install.

The P1's most important plus point is the minimum thickness that it can handle, which, in this specific case, is 0.4 mm (maximum 1.6 mm): generally a major issue for any machine, yet P1 manages to handle it stably and efficiently. This machine truly opens up hitherto unthinkable application scenarios in terms of the type of panels that can be produced.

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New FGEVO for various operations

The new FGEVO from Behringer can perform various drilling operations with carbide and HSS drills, milling, long holes, big diameters, marking and deburring operations of gusset plates up to 1,000 x 650 x 40 mm. This meets most standard requirements in fabrication, or even 2,000 x 1,000 x 60 mm (FGEVO 2000) for bigger works.

The closed portal machine frame ensures an optimal rigidity, and a special attention was paid to the parts transfer and their support during machining thanks to feeding carriage system with grippers as well as ball table permanently supporting the plate. These are key parameters for high speed carbide drilling and vibration-free milling, making the machine very productive.

The 4-position (optionally 8-position) automatic tool changer helps minimise operator intervention.

The exclusive V-scoring fast scribing system is a standard feature of FGEVO, ensuring a fast and precise part identification and layout marking.

Additional modules have been designed to increase productivity and improve machining possibilities: the disk marking unit with 25 positions guarantees fast and deep marking and a hole deburring unit can also be integrated to deburr the lower face of plates.

And of course, its main original features have been kept. Its ergonomic design for easy loading and unloading, thanks to the grippers positioned at the rear of the machine, PRONC23D powerful, user-friendly programming software and very low running costs, thanks to the extended tool life among others.

Vernet Behringer, together with its German affiliate company Behringer GmbH, within the Partners for Steel (P4S) alliance is the only company that offers a wide spectrum of production lines exclusively dedicated to structural steel fabricators, steel stock holders, and transmission towers specialists. Its range of CNC machines covers all the crossed combinations of punching, drilling, sawing, shearing, marking and plasma/oxy cutting for any type of steel profiles, angles and plates.

More than a conventional "machine supplier", the company boasts more than 130 years combined experience which has cemented its reputation as a global solutions provider. It offers turnkey lines together with its partner Rösler, comprehensive software packages or purpose-built machines for specific demands, such as railway rails machining.

The newest machines, like HD-XEVO for profiles or VP-X for angles, combine high productivity, low production costs and reliability.

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A sheet metal flow

Made possible by automation and digital connectivity, everything flows. At EuroBLECH, Bystronic cut, transported, bent and sorted sheet metal parts in a fully automatic "Production Cell."

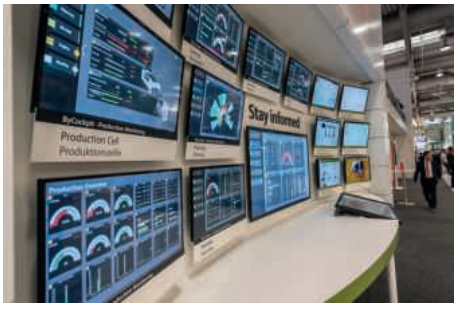
So how does sheet metal processing work with Industry 4.0? The Production Cell is a networked manufacturing solution for the cutting and bending of sheet metal products. Hence Bystronic has taken the next logical step towards full automation and cross-process solutions. For the first time on an exhibition booth, Bystronic interlinked systems to form a fully automatic production cycle.

The Production Cell is capable of processing sheet metal products both in large series and on a small scale. The cell adapts flexibly to varying order situations. The idea behind this automation solution is to combine versatility and productivity. Both are important requirements for industrial sheet metal processing. This interlinking is possible thanks to the modular design of the integrated systems and the software.

Big data on the screen

Networked sheet metal processing starts on the screen. This is why there is a wall with numerous screens on the exterior of the Production Cell named the ByCockpit. Here, all the information relating to the production processes is bundled. Customers can monitor all the process steps within the Production Cell on the screens, with questions such as: How far has the processing of cut parts on the laser progressed? Is job X already being processed by the bending station? When is the next maintenance of the cutting and bending systems due? And last but not least, the most important question: When will the parts be finished and sorted according to jobs, ready for delivery?

The information on the screens is based on real-time data that is transmitted by the sensors and video systems on the individual processing stations. With the ByCockpit, Bystronic has implemented an important aspect of Industry 4.0: the meaningful utilisation of the ever increasing availability of process data. All the Bystronic systems that are integrated in the Production Cell are ready for this step of digital networking.



In future, Bystronic will extend this stationary version of the ByCockpit with a mobile version. This will enable users to launch the ByCockpit as a web interface on mobile devices. The web interface will provide users with information such as: Are their production processes progressing according to schedule? Are all the integrated systems running at optimum capacity? When will the raw material warehouse require restocking? All this is made possible thanks to the web technology developed by Bystronic.

Fibre laser speeds up the cell

The heart of the Production Cell is the ByStar Fiber 3015 laser cutting system.This is where the speed of the entire manufacturing process is generated, which subsequently flows step-by-step right through to bending and the delivery of the finished sheet metal products. The ByStar Fiber cuts everything it is fed with: from stainless steel, through to aluminum and mild steel, right up to non-ferrous metals, such as copper and brass; all this from thin to thick.

Inside the ByStar Fiber lies the next innovation, a newly developed cutting head that Bystronic that was presented live at EuroBLECH. What is special about this cutting head is the Spot Control function. Depending on the sheet thickness and material, it adapts the focal point of the laser beam with high precision, fully automatically without any operator intervention. Thanks to Spot Control, the cutting head thereby consistently achieves the optimal processing quality in varying sheet thicknesses and materials. This makes the ByStar Fiber ideal for environments with frequent changes of jobs and materials.

With the ByStar Fiber, Bystronic demonstrates its extensive know-how in the field of laser cutting technology. Machine design, cutting head and the ByVision Cutting control software were all developed and implemented in-house by Bystronic's laser specialists. Thus, Bystronic offers almost all the performance-relevant components of the ByStar Fiber from a single source. This is particularly important with regard to the users' increasing quality requirements, which constantly drive the improvement of technologies and manufacturing solutions.

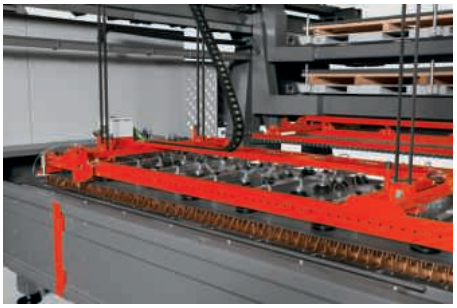
Automation determines the material flow

The ByStar Fiber is directly linked to another "made by Bystronic" innovation: the new ByTrans Cross loading and unloading system. Within the Production Cell, it handles the entire material flow associated with laser cutting. The automation unit's task is to ensure the necessary supply and removal of materials. To achieve this, the ByTrans Cross supplies the necessary raw metal sheets and removes the cut parts and residual sheets from the fibre laser system's shuttle table after the cutting process, all at an incredible speed. The system requires only 60 seconds for the complete loading and unloading cycle.

In addition to the fast and precisely synchronised material flow, the versatility that the loading and unloading system offers the user is another unique feature of the ByTrans Cross. The system has a modular design, which allows it to be integrated in a wide variety of production environments. The ByTrans Cross is also equally well suited for use as a stand-alone solution. In this application, the system provides the laser with raw metal sheets in

various thicknesses without being linked to the warehouse. To this end, Bystronic offers the option of equipping the ByTrans Cross with two cassettes, which can be used for material storage or as a deposit for the cut parts.

Within the Production Cell, the ByTrans Cross system can also be upgraded with a new sorting module. This further increases the automation level of the loading and unloading unit. The sorting module is available as an upgrade for the ByTrans Cross, which enhances the unloading process on the laser cutting system. With this option, the ByTrans Cross unloads residual sheets and large parts from the laser system's shuttle table and if required sorts them according to cutting job.



Robot operates the bending station

In the bending station, Bystronic has also integrated this process step into the Production Cell. Following the material storage facility, an Xpert 150 press brake waits in the form of a fully automatic bending station. The cut parts flow from the laser cutting system via the storage facility and then on to a material deposit for the bending machine. A robot picks up the individual parts, turns them to the correct position, and feeds them to the Xpert for bending. To achieve this, the robot is equipped with a 7-axis arm, which provides it with an extremely high degree of manoeuvrability. The robot can handle parts up to 270 kilograms. This means that a broad spectrum of sheet metal products can be bent. The bending station thus matches the broad spectrum of the fibre laser.

After the bending process, the robot sorts the finished parts and places them in separate storage areas. Depending on the configuration, the bending station offers room for up to 15 of these areas, where the finished parts can be sorted, for example according to jobs. All that the user has to do now is to pack, label, and ship.

Analyse and plan every step

The final step is once again software. At EuroBLECH, in connection with the Production Cell, Bystronic presented the extended version of the Plant Manager. In addition to cutting processes, the software module now also covers bending. This turns the Plant Manager into the ultimate planning tool for users, with which all the processing steps associated with cutting and bending can be planned and analysed.

The increasingly complex demands that are placed on the manufacturing of sheet metal products means that the relevance of such software is constantly growing. And the more comprehensive the networking and automation of the manufacturing steps in the sheet metal processing business become, the greater the importance of tools such as the Plant Manager assume for users.

For example, the software supports users already during the creation of optimised cutting and bending programs. This field offers many opportunities to organise the subsequent cutting and bending processes as efficiently as possible: Space-saving grouping of the parts that are to be cut on the metal sheet, defining the ideal cutting technology for each part, and subsequently planning the processing sequence of the parts that are to be bent in such a manner that the automation system spends as little time as possible retooling. Thus, the Plant Manager reduces unproductive time with order situations that require varying tool configurations on the press brake.

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Prima Power innovation at Euroblech

New Laser Next 2130

Hot stamped parts are increasingly replacing traditional metal formed parts in automotive frame design and this trend is ever increasing. These components play, in fact, a fundamental role in reducing vehicle weight, and consequently fuel consumption, CO_2 emissions, in order to achieve 5-star safety ratings.

A recent trend that is gaining momentum is the adoption of a new door ring concept, hot stamped as one part instead of the four parts which are usually required. This minimises production costs, reduces the weight and increases the performance of this component.

Prima Power has designed a new product focused on this specific application: Laser Next 2130. This new model, had its world premiere at the Euroblech exhibition in Hannover and maintains the performance and the winning solutions of the 1530 model with an increased working volume, making it the right solution for the cutting of large size hot stamped components.

Marco Pivanti, 3D laser product manager, says: "We could already offer the best and fastest solution for the cutting of standard sized hot stamped components at Prima Power but we needed an evolution of the Laser Next 1530 featuring an increased Y stroke to allow the processing of larger components such as the door ring. Today we are proud to announce that a first-class machine dedicated to this new and promising application has been added to our product range".

Laser Next 2130 has a considerable working volume of 3,050 x 2,100 x 612 mm with a high-precision and dynamic 5 m turntable. Thanks to a well-conceived layout, the system is nonetheless extremely compact and space efficient.

Laser Next can boast the best dynamic performance on the market for a 3D laser machine, 208 m/min trajectory speed and 2.1 g acceleration, achieved by the use of highly innovative solutions and materials for kinematics and machine structure such as direct motors and transducers for main axes and focusing head, and machine frame in synthetic granite with optimised shape.

Laser Next 2130 can be equipped with 3 kW or 4 kW high brilliance fibre laser. The model exhibited in Hannover features the new fibre laser source developed and manufactured by Prima Power.

Laser Next features: state-of-the-art focusing head, direct drive motors for top performance, double protection SIPS and fully metallic sensor for highest safety, focal position control for great flexibility, compact size for best dexterity, fully sealed enclosure for complete protection.

Laser Genius

The new version of the high performing 2D laser machine by Prima Power comes with plenty of innovations to further increase customer benefits.

Prima Power has developed its new fibre laser head with adaptive optics for the automatic management of the focal position and diameter and a fast, reactive and accurate stand-off measurement. The new head is designed for excellent cutting quality and dynamics on all materials, the highest cutting pressures and the harshest environment.

Giulio Amore, 2D product manager at Prima Power, says: "With our new head the range of applications of Laser Genius is widened to cover all materials and thicknesses always with the best results. This increased flexibility adds to the other amazing characteristics of this unique product which include linear motors on X and Y axes, carbon fiber carriage and synthetic granite frame. It also features the optional technological suites SMART Cut, MAX Cut and NIGHT Cut to maximise customers' competitiveness according to their application".

An important breakthrough on the Laser Genius is the new fibre laser developed and manufactured by Prima Power. The CF series, available with 3 kW and 4 kW power, features high reliability and quality diodes,

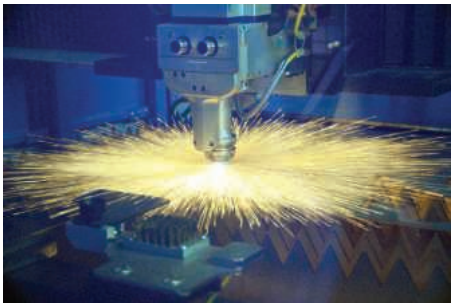
better protection against back-reflections, a patented highly reactive electronic shutter (switch on/off time 200 ms) and a high integration into the system. The highly efficient service directly supplied by Prima Power is a further strength of these generators.

At Euroblech, Laser Genius was exhibited with the Open Cabin. It features fully opening sliding doors granting excellent accessibility and user friendliness for the operator, in line with Prima Power's tradition. The Lean Cabin is also available for minimum footprint, easy installation and competitive price.

Laser Genius is managed by the new, cutting edge Prima Power Open Laser2D CNC, featuring multi-interpolation and optimised motion algorithms for best approach, lead-In and disengage movements, cycle time reduction, smart gas pressure management, improved grid cutting speed and innovative software compensation solutions to further enhance cutting quality. The human machine interface framework is Prima Power Tulus Laser2D HMI, a highly logical, modern and user friendly interface with a smart task list concept, fast tool setup, optimised technological parameters and simple management of sorting and stacking operations. The machine productivity is further enhanced by the CADCAM application NC Express e^3 with highly positive impact on sheet usage, tool path and cycle times.

Prima Power products are "Industry 4.0 Inside", ready for the smart manufacturing era. The products provide complete connectivity to the company organisation of the customer, the digitalisation of system and production monitoring, diagnostics, analysis and service through advanced solutions such as fleet management, and the new app for a simple and smart use of the machine Tulus MUPS (Machine User Personal aSsistant).

Also, machine automation presents important developments. Laser Genius is equipped with the new Combo Tower Laser, the flexible storage system with integrated loading and unloading features for 2D laser machines developed and manufactured by Prima Power. It is a key module for automating the material flow, making different materials quickly and automatically available whenever needed. It can also serve as intermediate storage for ready cut



components along with skeleton. There can be one or two shelving units in the Combo storage and height can be chosen by needs. The model with one shelving unit is designed to serve only one 2D laser machine, while with two shelving units more machines can be integrated as part of the system; depending on the required work stages and techniques, these are selected from the wide range of Prima Power solutions for punching, laser cutting, integrated punching/shearing and punching/laser cutting.

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Laser revolution at EuroBLECH

At EuroBLECH, Yamazaki Mazak demonstrated its latest advanced technology with new laser machines and automation systems making their world debuts.

The new SUPER TURBO-X 3015 Fiber series is the latest generation of Mazak's highly popular SUPER TURBO-X lasers, which have sold more than 4,000 machines in Europe since 1990. Until now, the SUPER TURBO-X has always been a CO_2 laser, but the latest machine utilises fibre laser technology to deliver faster cutting times and lower running costs.

The new SUPER TURBO-X 3015 Fiber is available in both 2 kW and 3 kW versions and has a significantly smaller footprint than its predecessor CO_2 machines and other competitor fibre lasers. The compact machine has a 7,400 x 2,900 mm footprint which makes it ideal for sheet metal job shops with limited floorspace.

The new laser cutting machine is able to cut highly reflective material, such as copper, glass and galvanised sheet and offers significantly lower running costs compared to CO_2 machines, with savings on electricity consumption and maintenance. Typically, laser-users benefit from lower running costs due to a circa 80 percent reduction in oscillator electrical power consumption and a 100 percent reduction in laser gas consumption, compared to CO_2 lasers.

In terms of cutting performance, the new SUPER TURBO-X 3015 Fiber is capable of significantly faster cutting speeds than its CO_2 laser competition, capable of high speed cutting for both thin and mid-thickness materials. The machine is capable of rapid speeds in the X- and Y-axes of 50m/min and 25m/min in the Z-axes along with acceleration of 0.2G for thin sheets, 0.12G for middle thickness sheets and a maximum cutting speed of 50m/min.

Crucially, the new SUPER TURBO-X 3015 Fiber machine can be fitted with Mazak's existing FMS laser automation systems, which enables an easy upgrade to fibre cutting for existing ST-X CO2 laser machine users.

Mazak also gave a world debut to the first ever Direct Diode Laser (DDL) to be developed for flat sheet, at the exhibition.

The new OPTIPLEX 3015 DDL 4kW, using the Direct Diode Laser technology, is the next generation of solid state laser for the industrial laser applications, offering the greatest efficiency for laser cutting operations.

The machine, which complements Mazak's existing CO_2 and Fiber OPTIPLEX machines, utilises a Mazak manufactured Direct Diode Laser and has been positioned to offer premium cutting performance, specifically those requiring ultra-fast cutting and high quality cutting edge.

The OPTIPLEX DDL series can cut thin material 20 percent faster than fibre lasers and thick materials with unsurpassed surface quality. The machine has an axis acceleration of 1.8 G and benefits from rapid traverse rates of 120 m/min.

Positioning accuracy is maintained to within ±0.05 mm/500 mm in the X- and Y-axes and to within ±0.01 mm/100 mm in the Z-axis. The machine also offers exceptional repeatability accuracy ±0.03 in the X, Y and Z axes.

Crucially, the OPTIPLEX DDL is a highly efficient machine capable of a wall plug efficiency of 40-50 percent compared to 10 percent for a CO_2 resonator; 15-20 percent for a disc resonator and 30-40 percent with a fibre resonator.

The OPTIPLEX DDL also benefits from an exceptionally user-friendly ergonomic design, including the new NC control PreviewG.

Gaetano Lo Guzzo, director for laser business europe at Yamazaki Mazak, says: "The OPTIPLEX DDL series is the result of many years of development and offers a real step-change in laser cutting performance. Now, Mazak laser users can benefit from ultra-high speed cutting, outstanding accuracy and best-in-class efficiency, capable of delivering industry-leading productivity and profitability. The DDL series is nothing short of a revolution for laser users."

Mazak also introduced two new automation systems at EuroBLECH 2016. An OPTIPLEX NEXUS 3015 4 kW laser machine will be equipped with the latest version of Mazak's flexible automation technology.

QUICK CELL, which has been designed by famed Japanese industrial designer Ken Okuyama, is available in three different specifications, 6-stocker, 10-stocker and 14-stocker versions.

The new QUICK CELL technology, which is capable of significantly faster processing speeds compared to the original design, enables unmanned laser cutting operations, with the next operating pallet being prepared during processing. The new pallet is loaded as soon as the cutting process is complete with the used pallet moved to the stocker. The version exhibited at the show is a 6-stocker version.

Mazak also introduced its new laser CNC, MAZATROL PreviewG, the world's fastest CNC. PreviewG combines intuitive touchscreen operations, similar to smartphones and tablets, with new machine hardware and servo systems, which together can dramatically reduce programming and processing time.

Yamazaki Mazak gave centre stage to laser automation at EuroBLECH with the introduction of two new materials handling solutions.

LaserFlex 4.0 is an independent materials handling solution that can be fitted to a CO_2, Fiber and DDL lasers technology in the OPTIPLEX 3015 / 4020 and OPTIPLEX NEXUS laser cutting machine. LaserFlex 4.0 enables the fast-handling of raw material and cut plates and in operation is capable of process time changes of less than 75 seconds.

The compact, easy-to-use solution is equipped with two independent units, one for the handling of raw materials whilst the other unloads cut plates. The LaserFlex is easily expandable, depending on the storage capacity or the number of laser machines it is required to feed. Numbers of customized lay-out are also possible.

Crucially, LaserFlex 4.0 has an open interface to the laser machine and also offers full access to the operator, for both laser table and handling components.

Mazak also exhibited its new QUICK CELL laser automation technology, which has been designed by famed Japanese industrial designer Ken Okuyama.

QUICK CELL, which is ideal for volume production operations, is available in three different specifications, a 6-stocker, 10-stocker and 14-stocker versions. The version exhibited at the show was the

six-stocker version. In addition, QUICK CELL boasts a compact floorspace and can be easily expanded after the initial installation.

Gaetano Lo Guzzo, director laser business Europe at Yamazaki Mazak, concludes: "Our presence at EuroBLECH 2016 is evidence that we continue to lead the market in providing state-of-the-art laser technologies. The combination of new machines, automation systems, and new world's fastest CNC, along with innovative laser technology, offers laser users nothing short of a revolution in laser cutting."

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A new era in industrial welding

Kemppi has launched three new solutions that redefine performance and usability, the health and safety of welders, and welding management capabilities in extreme industrial welding production.

For industrial welding systems, Kemppi presents a premium, multifunctional welding solution, the X8 MIG Welder, which allows for excellent welding performance and usability through new, extreme innovations in welding hardware and software. It has never been faster, easier or smarter to change system and welding settings, adjust and control welding values, or view WPS content. The new technology unleashes the enormous potential of the IoT and connectivity.

For the health and safety of welders, Kemppi has redesigned the welders' personal protective equipment and has optimised mobile solutions. The new GAMMA GTH3 welder respirator combines comfort with the highest TH3 level of breathing protection. The portable and cordless welding machine Minarc Cordless 150 C has been designed for the most demanding welding tasks to bring freedom and the joy of working to maintenance welding. Both the X8 MIG Welders and Minarc Cordless 150 C welding machines are made in Finland.

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

For automated welding, Kemppi's state-of-the-art solution, the A7 MIG Welder 450, is a complete, perfectly balanced process package which can be integrated with any robot brand.

Welding is becoming more challenging as new materials have greater strength, higher corrosion resistance and other performance-enhancing properties. Kemppi's new X8 MIG Welder is engineered

to meet even the most extreme expectations of industrial welding and to cover a wide variety of materials. The X8 MIG Welder is a multi-process system for MIG/MAG welding, MIG brazing, cladding and gouging with extreme power and accuracy, using the most common electrical network voltages. Every aspect of the solution is designed to meet the best usability practices. The solution consists of Kemppi's unique high-duty and upgradeable power source with an all-in-one wire feeder, ergonomic welding guns, intelligent software, and a wireless Control Pad for total welding control. The wireless Control Pad allows the welder to easily find the relevant WPS, view the content and activate it to start welding.

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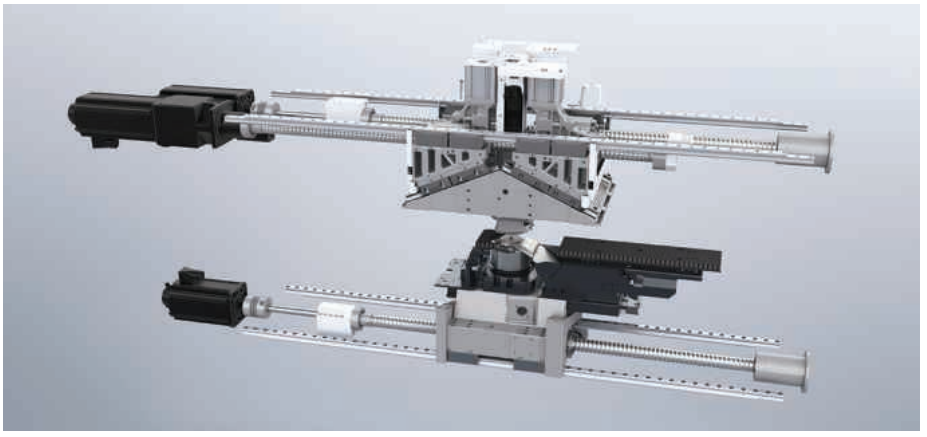
A machine that grows to meet new challenges

Many TRUMPF customers want an economical, compact and automation friendly punching machine that is specifically designed to grow with their business. To address this need, the company presented a new compact entry-level machine at EuroBLECH. The TruPunch 1000 can be expanded into an equally space-saving TruMatic 1000 fiber punch laser machine, allowing sheet metal processors to upgrade their machine to keep pace with their growing business.

With its expandable functionality, the TruPunch 1000 provides the perfect entry point into the world of professional punching. It can handle sheets up to 6.4 mm thick at rates of up to 600 strokes a minute, yet is remarkably compact. With a footprint of just 6.5 x 4.9 metres, the TruPunch 1000 stand-alone machine is around 15 percent smaller than its predecessor.

A 3 kW TruDisk solid-state laser can be connected up to convert the TruPunch 1000 punching machine into a punch laser machine. This configuration precisely matches the other recent addition to the TRUMPF product range, the TruMatic 1000 fiber. This is the first time that TRUMPF has offered a combination machine in the entry-level segment, a move that makes it easier for customers to make the switch from purely 2D laser processing to punch laser technology. Customers who already have a TruDisk solid-state laser can also use this to operate the TruMatic 1000 fiber via the TRUMPF laser network.



The patented Delta Drive eliminates the need to move the metal sheet and machine table in the y-axis by moving the punching head in this axis instead

Revolutionary punching head

Both the new models in the 1000 range offer completely redesigned drive technology, which is crucial to the success of the modular concept. The patented "Delta Drive" literally marks a new movement in the world of industrial punching technology. The advanced engineering team of TRUMPF came up with the new drive to facilitate the construction of smaller machines and open up new methods of material handling. The secret of the Delta Drive is that it eliminates the need to move the sheet and work table in the y-axis, normally an integral requirement of sheet metal processing. It achieves this by making the punching head quickly manoeuvre in that direction, representing a revolution in punching head technology.

This new approach involves a drive system that is powered by two servomotors. When the servomotors move in the same direction, they allow the punching head to move back and forth in the y-axis. The ball screws then rotate in opposite directions, activating the punching stroke. The y-axis can be accelerated far faster in this arrangement, because the punch drive is also used for travel motion, eliminating the need to move the sheet or work table. As a result, the punching process is more dynamic and the machine is more productive. Furthermore, the lower relative movement between the machine table and the metal sheet reduces the risk of jamming and collisions, making the process more reliable overall. Finally, the stationary machine table significantly reduces the size of the machine's footprint.

A laser cutting head, laser evacuation unit and beam guard turn the TruPunch 1000 into a TruMatic 1000 fiber

Automatic sorting

Both the TruPunch 1000 and the TruMatic 1000 fiber can automatically sort finished parts measuring up to 180 mm × 180 mm. All processed parts are sent down a chute into a sorting unit which moves in a linear direction. From there they can be sorted into a series of boxes (up to four different 400 mm × 300 mm boxes). The boxes are positioned below the machine, which provides for easy removal by the operator.

Due to the innovative movement of the punching head, the machine also offers an alternative way to remove the parts. This second method comprises an additional big flexible parts flap, which is available as an optional extra for the TruPunch 1000 and fitted as standard in the TruMatic 1000 fiber.

The flap can be equipped with a sensor that detects whether all the parts have been properly ejected from the machine's working area. Designed with relatively generous proportions, this parts flap can also be used to eject long and wide parts into containers or onto conveyors or pallets during both punching and laser operations.

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LVD adds two new models to Phoenix series of fibre lasers

LVD Company nv has expanded its fibre laser portfolio with the Phoenix FL 4020 and Phoenix FL 6020, two new laser cutting machines designed to handle sheet dimensions of 4,000 x 2,000 mm and 6,000 x 2,000 mm respectively.

Available in 3, 4 and 6 kW versions, the new Phoenix models offer high versatility as all-round machines able to deliver first-class cut quality in both thin and thick materials in standard steels as well as non-ferrous materials and process large sheets quickly and economically. Phoenix Series machines provide the highest energy efficiency and productivity benefits of fibre laser technology.

Advanced fibre cutting head technology

Phoenix FL machines achieve superior cut quality through an advanced cutting head design that allows automated adjustment of focus position and focus diameter, known as "zoom focus." To achieve the highest possible speed in every material thickness, focus position and diameter are automatically controlled and adjusted by the CNC controller. This advanced technology makes the Phoenix FL a most flexible fibre laser cutting machine, able to cut different sheet thicknesses with high productivity and excellent cut quality.

High dynamic processing

Phoenix 4020 and 6020 models feature uprated drive systems to achieve the same dynamic performance as 3015 models allowing fast processing of large format sheets. Phoenix lasers provide high dynamic processing and fast cutting speeds thanks to the 1µm fibre wave length. Acceleration and overall accuracy is further supported by the machine's rigid welded steel frame construction. An integrated control and drive system ensure the highest reproduction of programmed contours at fast processing speeds.

Uptime maximised

Phoenix machines keep uptime high with an integrated automatic shuttle table system that allows one table to be loaded while the machine is cutting on the other table. A touchscreen control and LVD's TOUCH-L user interface make the Phoenix easy to use and operate, further increasing machine uptime. The 19-inch touch screen and

icon-driven user interface guide the user through all necessary man-machine interactions. TOUCH-L also incorporates a part programming and nesting feature so users can import drawings directly into the control, applying cutting technology and nesting sheets at the machine.

Productivity enhancing options

Productivity enhancing options include a 10-station automatic nozzle changer and CADMAN-L programming software. CADMAN-L allows automatic or interactive determination of cutting sequences, nesting, full cutting path simulation, as well as other powerful features to simplify programming.

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AMADA's digital solution

The theme for EuroBLECH 2016 was "the new generation of sheet metalworking," highlighting how the metalworking industry has to adapt its production processes to the market trends. Batch sizes decrease steadily, the demand for assembly work increases, extreme flexibility and speed are requested in the processing of materials and thicknesses which are constantly changing. All this must be done at the most competitive price possible along with maximum quality and profitability. With 70 years of experience, Amada showcased a complete and flexible approach to smart manufacturing, in order to make new opportunities out of these challenges.

Productivity is the key to the competitiveness for every company. Production technologies are the source for innovation, differentiation, ensuring the final clients' loyalty and facilitating the capacity to acquire new clients for the customers. AMADA not only creates machines but also answers specific needs by delivering "tailor-made" solutions. At EuroBLECH 2016 and worldwide, it strives to help customers face their economic challenges.

Presenting the latest technology in a fast changing market

The main concept at EuroBLECH 2016 from the Japanese manufacturer was "Creating the customers value using AMADA's latest machines and processing technologies." It introduced fibre laser cutting and laser welding machines, a combination machine, press brakes and the new VPSS 3i software, the sheet-metal engineering system which can simulate all the processing operations at once. In addition, it showed some sample workpieces with accumulated know-how of processing technology.

AMADA showcased more innovations than ever before at the industry's flagship trade fair EuroBLECH. Also on display was an overview of AMADA's IoT "V-factory," which was shown as a 'Smart Factory' concept. Eight latest technology AMADA machines and AMADA MIYACHI products were on show in live operation over an area of some 2,000 square metres. All the machines on view were, of course, production-ready. Every one of them represents a further development to an existing solution or a completely new innovation.

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In-house waterjet cutting

Just-in-time manufacturing is one of the buzzwords in modern production. Thanks to their superior flexibility, STM waterjet cutting systems offer the option of handling production orders in-house

External production was yesterday's game. Today's enterprises offer in-house waterjet cutting.

For more and more manufacturing enterprises, external manufacturing costs take up a considerable chunk of their overall budget. To ensure that they remain competitive and to further boost internal efficiency, many companies increase their focus on in-house production. This is where the versatile modular STM waterjet cutting systems come into play. The ability to ensure instant cutting processes with consistently high quality, in addition to the low operating costs, leads an increasing number of prospective customers to the doors of Austria's waterjet specialists STM and its German system partner Maximator JET.

"Quality, delivery times and production cost are best controlled by using your own waterjet cutting system," according to STM owner and managing director Jürgen Moser. "These reasons are the main motivation for many prospective customers."

Prototypes and small series, in particular, can be implemented cost-effectively within a very short timeframe. However, the multifaceted waterjet systems from STM also handle weld seam preparations and maintenance activities.

The most important factor when deciding to purchase an in-house waterjet cutting system is efficiency. What is the system's utilisation rate? How high are the operating costs? STM and Maximator JET sales engineers answer these questions with a comprehensive efficiency and profitability analysis. Of course, the entire team of the Austrian waterjet specialist supports prospective buyers in all aspects of production.

The modular design means that the waterjet system can be adapted to the requirements of each buyer. Many customers find that the low entry price for STM waterjet systems, starting from 90,000 euros, including the high-pressure pump, provides a rapid return of investment. The low operating costs also ensure more economical production processes.

"For most customers, investing in an STM system pays off as soon as after two years", enthuses Sven Anders, owner and managing director of Maximator JET.

A particularly important aspect when developing in-house production capacities is often overlooked. Using an in-house waterjet system also helps to develop in-house expertise, a great economic advantage. The system lets you specify suitable cutting parameters and instantly price orders and it ensures optimum nesting processes for best utilisation of remnant plates.

"Since we employ easy-to-use cutting software, provide comprehensive training and actively support our customers in production matters, many of our customers are able to win new contracts within a very short period of time and handle existing contracts in a more profitable manner", says Jürgen Moser.

An in-house waterjet system also protects confidential production know-how and limits sharing of intellectual property. Companies not only build up expertise, but also protect their knowledge consistently. The risk that important information falls into the hands of competitors is significantly lower.

In this context, STM and Maximator JET consider themselves equal partners rather than being in a supplier-customer relationship. Sven Anders points out: "We want to get our customers excited about waterjet technology and create long-term success".

This is why both companies focus on ongoing guidance, training and comprehensive spare parts and maintenance services. This helps STM to ensure that the production processes of its customers continue to achieve maximum profitability in the long term. STM customer support starts with technical consulting, business planning and base costing and extends to the configuration of all-in-one systems, test procedures and shipping right up to sales training and the placement of subcontract work.

In addition to technical efficiency and customised advice, STM believes in flexible functionalities and the systems are precisely tailored to requirements. There is no need for unnecessary additional applications, and customers are not limited by specifications. Even entry-level models can be upgraded as desired to quickly and reliably meet changed requirements. This flexibility is largely due to the versatile modular design with a wide variety of cutting tables and accessories. The user-friendly, low-maintenance system design ensures resource-efficient production processes and a very convincing price-performance ratio. A number of tuning options are available based on individual requirements, including automated height scanning and collision protection, negative pressure monitoring in the abrasive metering system and the ability to use multiple cutting heads simultaneously.

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Waterjet solutions for career development

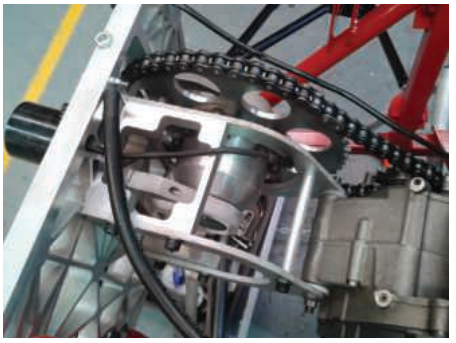
The roar of engines, the cheering crowd and a hand-built race car ready to prove itself on the tarmac

Every year, members of Formula UCLan put their best work forward to be a part of this experience. Formula UCLan is a group of engineering students at the University of Central Lancashire, or UCLan for short, dedicated to engineering and building motorsport race cars from scratch. The students do everything from developing CAD drawings to manufacturing the car and then enter their new vehicle into events in order to see how it performs. The goal of the program is to provide these students with real hands-on experience and help them improve their reputation among potential employers. This year, the Formula UCLan entered their race car for use in the Formula Student Event, a motorsport event where student groups compete and put their race car creations to the test.

The University of Central Lancashire is dedicated to providing its students with the tools and experience they need to achieve a competitive edge for their developing careers. Recently the engineering department looked into adding CNC machines into their workshop to improve the students' experiences. They considered both laser cutting machines and abrasive waterjet machines, and at the time decided to go with the laser cutter. Upon gaining a better understanding of what the waterjet can offer, it has now added a MAXIEM 1515 to the workshop.

Paul Critchley, principal technician of the LIS Workshop Services at UCLan, backs the decision by saying, "We came to better realise the merits of a waterjet such as ease-of-use and flexibility in terms of the huge variety of materials and thicknesses it can cope with."

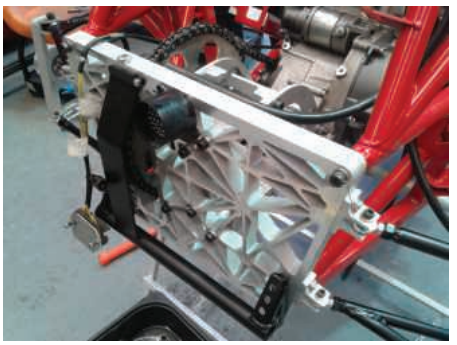
Adding the MAXIEM to the workshop resulted in new opportunities and helps the students to develop valuable skills. Paul Critchley notes that "the engineering students realised they could design parts differently knowing the capability of the waterjet machine."

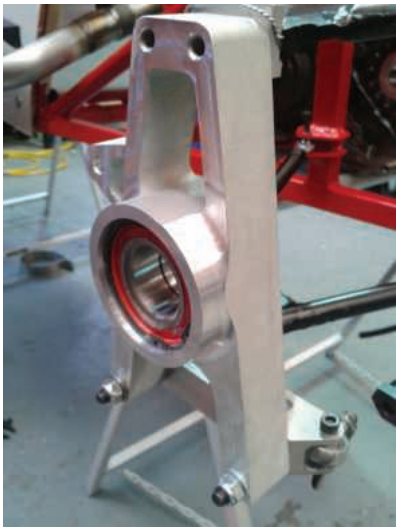


The students were able to redesign several of their parts and transition them from time-consuming CNC machining to the easy-to-use MAXIEM abrasive waterjet. The intuitive design of the software makes it easier for UCLan to teach a larger number of students how to use the abrasive waterjet. As a result, students can quickly take the parts they have designed and cut them out in the shop on the waterjet. Often times these parts require little or no further machining and are ready to be put in place, reducing the amount of time they spend waiting on experienced CNC machinists.

UCLan's abrasive waterjet is mainly used for motorsport projects such as Formula UCLan's race car, as well as eco vehicles and superbikes. Formula UCLan has been able to use the MAXIEM for a large number of their parts including a variety of steel brackets for the frame, aluminum wheel bearing housings, and even the brake discs. Due to the versatility of the waterjet, the workshop has also been able to help out with a few physics research projects cutting ceramics and silicates.

The greatest benefits of the MAXIEM are the experience and skills that the students gain from using the machine. The staff at UCLan is dedicated to helping these students succeed in their futures and that includes offering access to the tools they need to gain an upper hand. The abrasive waterjet provides these students with a unique machine that opens up the opportunity to experiment with designs and materials.





Using these skills and experience, the members of Formula UCLan were able to produce a working race car built with their own hands for the Formula Student event. There they were presented with several hurdles including rigorous scrutineering tests and a damaged driveshaft caused by an accidental collision. Overall, despite these challenges, the team was highly satisfied with their accomplishment and what they had learned from the experience. This project is meant to form these students in ways that will help them in the future. Paul Critchley concludes: "The engineering industry is demanding graduates with more practical skills and a much greater appreciation of production methods. The abrasive waterjet has played a key role in helping us to meet that demand."

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Reduced costs with high quality

For over 25 years, Brenner GmbH & Co. has been a global leader in the foam and elastomer industry, due to its ability to cut with high precision, high pressure waterjets. Operating 14 machines ranging between three and twenty cuttings nozzles per waterjet, Brenner is able to produce more than 300 million parts per year, mainly high-quality PU or PE foams.

With years of expertise, combined with state of the art technology, Brenner GmbH & Co has been able to secure its position as a world market leader in its product segment. This is the main reason managing director, Mario Brenner turned to TECHNI Waterjet when the company needed to reduce costs but keep up the same amount of production with high quality results. Brenner relied on TECHNI's Quantum NXT™ Electric Servo Pump Dual to accompany its large range of waterjets to not only keep costs down but also reduce noise level and downtime due to ease-of-maintenance, as well as reduce its carbon footprint.

Compared to other hydraulic pumps running the same production, TECHNI's Quantum NXT is able to significantly diminish the electricity bill by 22 percent. Those savings add up to a large sum when Brenner is running its waterjets at full capacity 80-90 hours per week and nearly 18 hours per day.

"We did a comparison with an identical machine running on the same parts with the same nozzle quantity, same pressure, etc. We achieved a reduction of energy of approx. 22 percent in comparison to a competitor's pump," states Mario Brenner.

Not only does Brenner rely on cutting costs with the Quantum, but also on cutting down noise. The Quantum is 800 percent quieter than a typical hydraulic intensifier, which adds up to a huge noise reduction when cutting with 14 waterjets. Typical hydraulic intensifiers run at 80 dBa, while TECHNI's Quantum NXT runs at less than 68 dBa.

"Noise reduction is always a desirable feature," comments Mario Brenner.

Brenner is committed to using economical resources with minimum environmental impact, which is one more reason it chose the Quantum NXT.

Left to right: Johann Graf, production manager, and Mario Brenner, managing director in front of their Quantum NXT 55dual

"Nowadays achieving a smaller footprint while reducing costs and becoming more environmentally friendly is one of the most important characteristics of any technical equipment," concludes Mario Brenner.

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WJS technology upgrade delivers productivity gains

Water Jet Sweden has been at the forefront of waterjet cutting for over 20 years and has been hugely successful in supplying customers with new machines. But whereas some suppliers believe their work is done when the machine has been installed, WJS believes the story is only just beginning.

Staying close to customers and helping them along their way in the waterjet cutting world has been the true success of the Ronneby, Sweden-based firm since 1995. By being a bespoke machine builder, WJS can tailor systems to encompass the customer's needs, rather than compromising on performance.

Upgrades form a major part of that process and one company who has seen the advantage of staying up to date with modern technology is WST AB. After glowing references from a UK customer with a similar setup, the Swedish based subcontract cutter has taken the step to drastically upgrade its pump capacity and performance.

It already has three WJS machines: two abrasive systems, each with four cutting heads, and a micro machine for bespoke miniature parts, and took the step to replace all of their ageing HP pumps with three BFT Servotron pumps.

The new technology is already paying dividends; the synchronised system has already provided savings on service costs but the other big advantage is more efficient waterjet operation.

With the servo motor acting like a stop/start feature seen on most new cars, the pump motor only runs when there is demand from the machine. This is hugely beneficial on applications requiring a lot of stop/starting and means the motor is idle and not drawing power when loading and unloading jobs. WST has also seen an immediate cost reduction with 15 percent power saving.

WST relies on a quick turnaround time on orders, so the investment is proving to be a big hit all round. Another advantage of the BFT design has seen WST reduce maintenance turnaround times, which means more time cutting and producing products.

With a surge in orders over the last couple of months, CEO Jonas Mörk reveals that the new pumps couldn't have come at a better time: "Without the new pumps we would have had it tough the last couple of months. They have been running nonstop and have saved us many man-hours of work. New technology saves personnel cost in two ways: we don't need someone fixing the pumps and unmanned operation becomes much more reliable."

By taking the decision to replace the HP pumps before the end of their expected lifetimes, WST has managed to get a quicker pay off time for the new investment, as Jonas Mörk explains: "We replaced the pumps early to get a better second hand value on the equipment. It makes them easier to sell and reduce the overall investment."

"It will take a couple of years to for the investment to pay for itself but we are already being more efficient. We can spend more time selling our services than doing service on our pumps."

WJS UK is currently in the process of delivering a similar BFT system to another UK customer. Sales director Gavin Bell says: "It's great to see the efficiency and increased productivity already seen by a number of our UK customers spread across the continent in to different markets. A lot of companies don't take account of the cost of maintenance and downtime so for a customer to see the cost savings so soon is great news.

We have done, and continue to do, a lot of R&D and testing at our Wetherby facility and are always looking for ways to make our customers more efficient. The abrasive savings seen by some UK customers has been significant and helps reduce their cost base considerably."

From its UK Technical Centre, WJS offers an unrivalled service and support package to keep your business ahead of the competition. Whatever you're waterjet requirements in 2D, 3D, robotics, pure water, abrasive or fine abrasive, WaterJet Sweden is the perfect choice.

CNC machines are manufactured in almost all sizes, for a variety of applications, from integrated compact machines to equipment with an operating size range of up to 18 metres.

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Jet Edge installs 5-axis waterjet system at UK headquarters

Jet Edge, Inc has announced that its longtime UK distributor Aquablast Ltd has installed a Jet Edge EDGE X-5® 5-axis waterjet cutting system at its headquarters in Beccles, Suffolk.

Capable of cutting sophisticated 3D parts and bevels up to 60° from virtually any material, Aquablast's Jet Edge 1,500 x 4,000 mm (5 ft x 13 ft) abrasive waterjet system is designed for 24/7 industrial use and maintains +/- 0.025mm (0.001") linear positional accuracy over 300 mm (12") per axis and +/- 0.025mm (0.001") repeatability (bi-directional).

"We are very pleased to offer an 'in-house' European showcase for Jet Edge's precision waterjet cutting equipment," says Donald Blair, Aquablast managing director. "Having a precision system in-house will allow us to demonstrate the capabilities of the Jet Edge 5-axis waterjet system to prospective customers from the UK and Europe. We will also be able to provide waterjet operation and maintenance training for companies that want to add this technology to their business model."

Aquablast has represented Jet Edge waterjets for more than 20 years and has extensive knowledge of ultra-high pressure waterjet technology and its countless applications. In addition to representing Jet Edge, Aquablast also manufactures its own line of waterjetting equipment and carries a wide range of mobile waterjet systems and support products. The company also offers precision waterjet cutting services, mobile waterjet cutting and surface preparation services, and safety training.

Aquablast is authorised to sell and service Jet Edge's full product line in the UK, including Jet Edge's CE-marked 5-axis and 3-axis waterjet motion systems, its hydraulic intensifier and direct drive pumps and portable cutting systems as well as water blasting equipment. Jet Edge claims to offer the widest range of waterjet pumps in the industry, from 36-280 hp, in 2,500 bar (36KSI), 4,000 bar (60KSI) and 6,200 bar (90KSI) models, electric and diesel.

"We are excited to have a waterjet demonstration showroom and training facility in the UK," enthuses Dave Anderson, Jet Edge international sales manager. "When customers see Jet Edge's capabilities in person, it's much easier for them to visualise how waterjet can help them solve their manufacturing challenges, reduce costs and increase productivity. Plus they can benefit from Aquablast's extensive waterjet applications expertise and hands-on knowledge of Jet Edge products."

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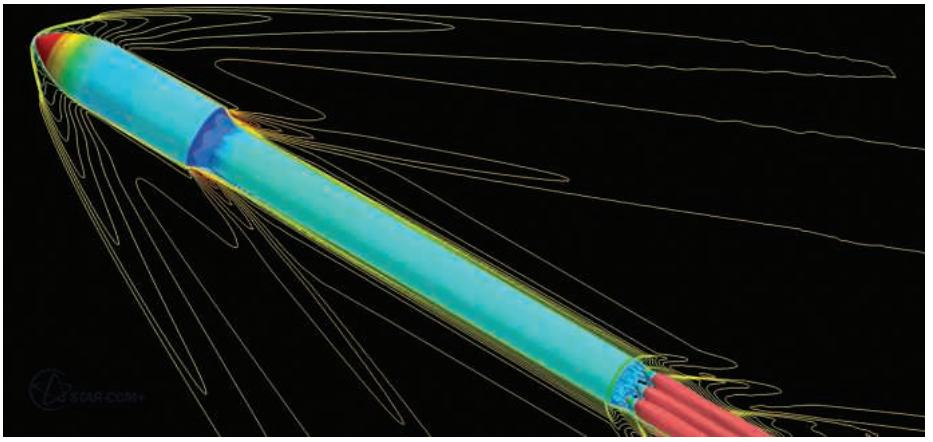
The sky's not the limit

SpaceX launches to success with four Flow waterjets

Space Exploration Technologies Corp. ("SpaceX") was founded in 2002 to develop and manufacture launch vehicles and spacecraft. SpaceX has successfully launched both the Falcon 1 and the Falcon 9 launch vehicles, and in 2008 was selected by NASA to resupply the International Space Station (ISS).

On May 25th 2012, the Dragon spacecraft became the first privately developed spacecraft to attach to the ISS, delivering water, clothing and food to the astronauts. On October 28th, the same year, Dragon completed its first official cargo resupply mission to the ISS, returning with important samples and space station hardware.



Better quality, more control

Having worked in the many industries that utilise waterjets, SpaceX engineers are familiar with the benefits of this process. Waterjets are very flexible and can cut virtually any material. They are often accurate enough to cut net or near net shapes. Burning methods such as lasers or plasma cutters create a heat affected zone that can cause microcracking when the part is shaped. For the aerospace industry, that microcracking can be catastrophic. Accordingly, the part would need to go through extensive secondary processing to grind away that hardened edge. With waterjets, there is no heat affected zone so no additional work needs to be done before the part can be used, saving time and cost.

High production company SpaceX found outsourcing limiting in their control over timing and quality. If a supplier made the part incorrectly, or the part required a design change, the timetable and those involved were negatively impacted. By bringing the work in-house, SpaceX engineers could have better control. Rick Cortez, manager of development operations, says: "From our experience outsourcing, we knew waterjets and their capabilities. We just wanted more control over the process."

Looking for the right waterjet

In July 2010, SpaceX purchased a Mach 3 waterjet cutting system with a 60,000 psi intensifier and Dynamic Waterjet®. A few months later, they added more tables. A Mach 2 system with a 60,000 psi pump was purchased for conventional cutting. They also purchased another Mach 3 system, with a HyperJet® pump rated at 94,000 psi and Dynamic XD® for bevel and 3D cutting. Dynamic XD brings to 3D parts the same taper control Flow developed for flat stock cutting.

More tables, more production

SpaceX plans to continue its successful development and launch of commercial rockets and spacecraft, resulting in an increasing need for highly accurate, efficiently cut parts. To meet this increasing demand, SpaceX purchased additional systems from Flow, including the latest in Mach 4 technology, to meet their exact requirements. "We decided to purchase Flow's Mach 4 systems to give us even greater flexibility," says Rick Cortez.

The newest addition to Flow's Mach 4 line of waterjets allows the system to be initially sized as 2 or 3 metres wide by 2 metres long cutting bed, with the ability to later expand to a length of 14 metres (48 ft). Each system is controlled by FlowMaster software, which allows the operator to load a drawing and simply enter the material, thickness and edge quality and then begin cutting parts. It also monitors the pumps, ensuring they are operating at peak performance.

SpaceX engineers enjoyed the waterjet benefits right away because of the time savings, control, and ease of making changes.

Rick Cortez concludes: "Because our waterjets are in-house, and because of their broad capabilities, parts can be designed and manufactured with a turnaround time of the same day or the next. Compare that to the two week or more lead time we had when we were outsourcing."

Flow's roots date back to the early 1970s, when former research and development scientists from Boeing founded Flow Research. The first technology commercialised by Flow Research was the use of an UHP waterjet as an industrial cutting tool. Soon after, the company invented, patented and perfected the world's first abrasive waterjet system.

Since 1974, Flow has delivered over 13,000 waterjet and abrasive waterjet systems to customers in more than 100 countries.

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Unmanned waterjet cutting

Waterjet cutting has been experiencing a significant increase in popularity in recent years. However, systems still have significant limitations to effectively support the development of continuous working processes. Who doesn't know the problem of loading the machine and waiting until the cutting job is fully completed? Or being limited in running long cutting projects because the weekend is close?

To address these problems, automation in production has gained significant interest, the reason being that automation creates new possibilities in production and can establish economies of scale. These possibilities to automate processes exist also when cutting with water pressure. The focus for effective automation can be placed on abrasive management as well as on the loading processes of the machine. Similar to other business areas, a great degree of automation can be achieved through software.

Waterjet systems from Resato can be operated with minimum manpower and provide new flexibility due to the focus on enhancing efficiency. The company has learned from its customers about problems in cutting and has developed three product features of our ACM Waterjet that are key in maintaining a high safety and quality standard while automating the cutting process:

Flexzone
Flexzone allows you to quickly supply the machine with new materials during the cutting process. Thereby, Resato has increased the uptime of the machine and the efficiency of your production processes. Innovative light curtains on the system's bridge guarantee high safety standards.

Abrasive Continuous Supply
Resato's Abrasive Continuous Supply System automates the supply of abrasives during the cutting process. Notifications about the supply level in the systems allow the operator to respond only when necessary. The refill process is simple and safe due to the external supply container.

ACM Job Manager
With the ACM Job Manager you can easily sequence existing processes and let the ACM Waterjet do the rest – all with minimum effort. It is this software extension that enhances production efficiency. Being able to reliably plan and execute cutting jobs provides valuable time for other tasks.

Resato International B.V. is a Dutch manufacturer of high pressure technology in various application areas. Its expertise, among other factors, lies in the development and production of reliable waterjet cutting solutions.

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Success with the help of Kerf

When Made Profiles first opened its doors for business in March 2014, the first acquisition for the sheet metal company was an RUM3500 profiling machine from Kerf Developments. Just over two years later and the fledgling Wigan subcontractor has grown exponentially, recently taking delivery of its third Kerf profiling machine, an RUR2500 high definition plasma machine.

Founded by managing director Mark Derbyshire, Made Profiles started with one man's ambition, decades of experience and a book of industry contacts. Using his expertise and business acumen, he initially opted for a Kerf Developments machine as he was familiar with the build quality, reliability, service and support that Kerf guarantee - all critical elements for a new business that would be reliant upon the uptime of its single machine. In the two years since its inception, Made Profiles has built its business around the reliability and productivity levels that Kerf has delivered.

The first machine installed, the colossal 12 m x 3 m bed RUM3500, has four flame cutting heads for simultaneously profiling multiple parts up to 250 mm thick. This machine also has one 150 amp high definition plasma head for high speed cutting of steel profiles up to 15 mm thick. Only six months after the installation, Made Profiles commissioned Kerf to extend the machine bed by 3 m. The new 15 mbed was incorporated on a second cutting machine with a high powered 275 amp plasma cutting head for rapidly processing steel sheets up to 30 mm in thickness.

Supplying cut profiles for the rail, oil & gas, automotive, construction and general subcontract engineering sectors, the first two machines suitably cater for the high speed and high definition cutting of thin profiles whilst the oxy-fuel flame cutting four- head configuration provides simultaneous cutting of extremely thick steel billets.

Kerf develops a bespoke solution

If the first two machines and the respective cutting head configurations were acquired to satisfy market demand, the arrival of the RUR2500 was specified to take the business to the next level. Already processing anything from mild steel, Hardox, Durbar and boiler plates, the biggest market growth has been cutting stainless steel profiles and this is why RUR2500 machine was installed. Delivered with Ultrasharp technology for precision cutting to less than +/-0.5mm with astounding edge finishes, the RUR2500 has been purchased specifically for cutting small stainless parts. The 150 amp cutting unit is well suited for parts up to 20 mm thick whilst the 4 m by 2 m bed has been configured by Kerf for small part production.

Mark Derbyshire says: "Typical spacing between the machine 'bed bars' is 100 mm, but we asked Kerf to supply a bed with a bar spacing of 50 mm. With the wider spacing, small parts could fall through the bed. With the bespoke bed configuration, we can now comfortably process parts as small as 50-60 mm square.

"Complementing this, the Ultrasharp gives us unparalleled edge quality and clarity when cutting slots, holes and other internal geometries on small parts that may have once been beyond our scope. We used to subcontract out any work smaller than 120 mm, with the RUR2500 we have brought this work in-house, slashed subcontract costs and reduced the associated lead-times by 4-5 days."

The new RUR2500 has been dedicated to stainless steel profiles, so its nitrogen and oxygen fuel configuration doesn't have to be continuously changed over. Furthermore, the new RUR2500 also has an argon gas feed for etching components.

Mark Derbyshire continues: "We also

wanted the machine to have an etching facility, this allows us to mark parts with identity numbers and reference codes to customer requirements. We are also etching datum spots for customers that want to drill or machine their profiles as a secondary operation. The changeover from cutting to etching is completely automated and seamless, thanks to the touch screen Burny 10 CNC control unit. We only have to enter our material types and cutting parameters and the control unit does the rest."

The component programming and part nesting for the Kerf machines is conducted off-line with the Lantek CAD system that is also supplied by Kerf Developments. Mark Derbyshire again: "We now have two seats of Lantek CAD software from Kerf and this maps out the cutting speeds, gas flow, nozzle height and even the torch path based on how to optimise material usage, productivity and cut-quality. We bought the Kerf RUR2500 as a 'laser equivalent' machine. With the Ultrasharp system, the RUR2500 is far superior to standard plasma cutting and this gives us the ideal machine for stainless steel profiling."

Commenting on the journey from the first

Kerf machine to the latest acquisition, Mark Derbyshire says: "We started with five staff and now we have 13. The business grew 100 percent in year one and two. Year three is on-course to almost match previous figures. This growth is down to our expertise and sticking to our core strategy of turning out high quality bespoke and small batch steel profiles faster than our competitors. Kerf Developments has been with us all the way to ensure our machines never miss a beat. This is one reason why we will keep returning to Kerf whenever we need to invest in machinery."

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New vacuum technology to clamp panels

Emmegi (UK) has begun supplying the innovative Tekna 743 vacuum clamping 3-axis machining centre into the UK market.

The innovative machine with a 6,400 mm x 2,000 mm worktable features vacuum technology to block panels and create a dust and chip free environment for the stable working of even very thin materials.

Emmegi say that it works equally well with composite, aluminium, steel, stainless steel or even titanium panels, so is ideal for companies working in the automotive and aerospace sectors, and enables manufacturers to machine even the lightest gauge sheets with unobstructed access to the whole surface.

The whole of the worktable on the Tekna 743 machine is coated with an air-porous Forex material which conceals the vacuum system underneath and distributes suction perfectly evenly across the whole table or across pre-defined sections depending on the size of panel being machined. It also absorbs vibrations to create a robust and stable work area.

The 3-axis machine features a 12 or 19-piece on-board tool magazine for drilling, milling or cutting and there is a 24,000 rpm spindle which generates 10 kW of power.

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UK's first 10 kw laser now in production

Sheet metal subcontractor Accurate Laser Cutting has announced a £700,000 investment in the UK's first 10 kW fibre laser

With its phenomenal processing speeds and newly improved processing capabilities, the 10 kW Bystronic ByStar cutting system sets a new benchmark in laser cutting and represents their second major investment in a Bystronic fibre laser in eighteen months.

The high performance equipment is capable of laser cutting aluminium and stainless steel up to 30 mm thick, mild steel up to 25 mm, 15 mm brass and 12 mm copper. It can also clean cut mild steel up to 15 mm thick.

Company director Jon Till says: "Nitro-cutting offers so much more to our customers. Previously, our ability to clean cut mild steel was limited to 3 mm using our CO_2 equipment. To now have the capability of five times that thickness is an incredible improvement and a major benefit to customers who require further secondary operation processes."

This latest investment completely replaces the CO_2 cutting equipment at its West Midlands manufacturing premises. Its laser cutting facility is now fully equipped with two state-of-the-art Bystronic fibre lasers; one 6 kW BySprint 4 m x 2 m and the latest investment, a 10 kW ByStar 3 m x 1.5 m system.

Director Steve Morgan says: "Following the success of replacing our first CO_2 laser with a 6 kW fibre laser in 2015, the move to upgrade our second CO_2 was inevitable. As soon as we heard whispers of a 10 kW fibre laser being developed by Bystronic, we knew it was only a matter of time before we had an all fibre line-up."

Its powerful 10 kW output allows for accelerated cutting speeds and is expected to provide a welcome boost to capacity on the shop floor. Jon Till says: "In our view, having the best technology equals the best service. With more speed, we have more capacity available to service our customers with even shorter lead times and still consistently deliver on quality and price."

The equipment's ability to cut thicker materials is another advantage. Jon Till continues: "Previously, fibre lasers performed better on thinner gauge materials, but with our new 10 kW machine this is no longer the case. For example, it can process 10 mm mild steel just as fast as our old CO_2 could process 5 mm, with excellent cut quality. With these improved capabilities, having a complete fibre line up makes sense. Not only is it more economical for our business, but it also offers our customers improved cut quality across the entire thickness and material range."

Another important factor is the fibres ability to process non-ferrous materials without causing damage to the machines resonator. Previously, laser cutting copper and brass could be quite problematic on a CO_2 cutting system due to its reflective properties, but with fibre technology, materials can now be easily processed without these risks and to an excellent standard.

In addition to its newly improved laser cutting service, the firm also has a dedicated pressbrake facility onsite with a maximum pressing capacity of 4 m and 320 tonnes.

Open House success

Accurate Laser Cutting celebrated its recent investment in the UK's first 10 kW fibre laser by hosting its first ever open house

In collaboration with machinery manufacturer Bystronic, the firm presented its state-of-the-art ByStar 3 m x 1.5 m fibre cutting system to visitors across the two-day event.

As part of the celebration, visitors were able to enjoy access to their newly refurbished 14,000 sq.ft manufacturing facility in Oldbury, West Midlands.

With a series of live demonstrations, they also had the opportunity to witness the equipment's phenomenal processing speeds of up to 60 m per minute, along with its ability to cut sheet metal up to 30 mm thick.

Company director Steve Morgan says: "We are proud to take possession of the UK's first 10 kW fibre laser and embraced the opportunity to showcase our new and improved processing capabilities to our customers.

"The idea of the open house was to demonstrate our commitment to delivering high quality and excellent service to our customers through investment."

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Endeavour gives dramatic results

When G R Contracts, a leading supplier of structural steelwork for the construction industry, were looking to invest in new steel processing machinery to increase productivity and reduce production costs, they never envisaged that it would have such a radical impact on business.

After investing time and effort into evaluating machines from several manufacturers it chose the Endeavour, FICEP's fastest ever automatic CNC line for drilling, milling and marking for beams channels and flats.

Not only has G R Contracts seen substantial increases in productivity, the scribing facility on the machine has substantially reduced the fit-up time for the fabricators. This has resulted in the fabricators finding that time has reduced significantly with the new Endeavour because they usually had to mark out and mag drill then fabricate the steel. Now they just have to fabricate the steel, the company decided to run the machine on two shifts which meant they doubled output with the same number of fabricators.

Robert Savage, director of G R Contracts, says: "We have now seen benefits of between 20-30 percent more pieces produced on one shift compared to the previous methods which used a saw on two shifts. When we have moved to two shifts on the Endeavour we are seeing a further 20-30 percent increase which equates to an overall 50-60 percent increase in pieces and productivity from the new machine. This is a result that has far exceeded our expectations.

Endeavour features for higher productivity include: much faster drilling, milling and scribing speeds; helical milling features; milling applications for pocketing; weld preparation capability; slotting in any direction; auto detection of the profile size; processing of tapered beams; easy access to the working unit and tool changers; new swarf collector design; ease of cleaning

Ficep UK's facility located in Wakefield Europort, West Yorkshire, contains its spare part stock, hotline support team and Ficep CNC equipment in our extensive showroom facility for customer training and product demonstration. The facility also provides an area to refurbish used equipment and to exhibit other agency products for deburring machines, pipe cutting equipment, material handling products and cold form rolling lines.

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Less contamination during cutting

EAGLE offers an innovative solution for the steel industry, defining new standards of work with the eVa cutting head. The new laser cutting head now enables laser cutting power up to 12 kW and processing of materials up to 60 mm.

eVa is a world innovation and EAGLE believes it to be the first in the history of steel industry with a cutting head seamlessly working with machines with previously unattainable power of 12 kW.

This cutting head is the answer from EAGLE engineers to the growing demand for efficient, durable and reliable solutions in the field of sheet metal processing. The device has been prepared with attention to the durability of its components. The result is competitive laser power, faster production, high efficiency and lower costs of operation and maintenance.

What distinguishes this type of cutting head is the lack of moving parts through the laser beam and the relatively simple design. Engineers prepared this cutting head only with two fixed lenses. Despite this, the cutting head continues to provide change of focus diameter and angle of the beam to the material. In addition, the cover glass is far away from the cutting process. This means that it is much less susceptible to contamination generated during cutting. The result of the slides replacement will require ten times less than in the heads of other manufacturers. Additionally, this device has a protective glass, mounted over a collimating lens, which prevents contamination on the lens.

As a result of these factors, the new cutting head is: four times less sensitive to dirt; ten times less frequent replacement of glasses; has the ability to service the shop floor; lowers maintenance costs; produces faster piercings; cuts the material with a thickness of 1 to 60 millimetres; provides the possibility of automatic exchange of nozzles; automatic centring, features automatic checking of the quality of the nozzle.

The advanced design allows a significant increase in laser cutting and increased production. The new cutting head is protected by five patents, making it the first of its kind for use in laser fibre technology.

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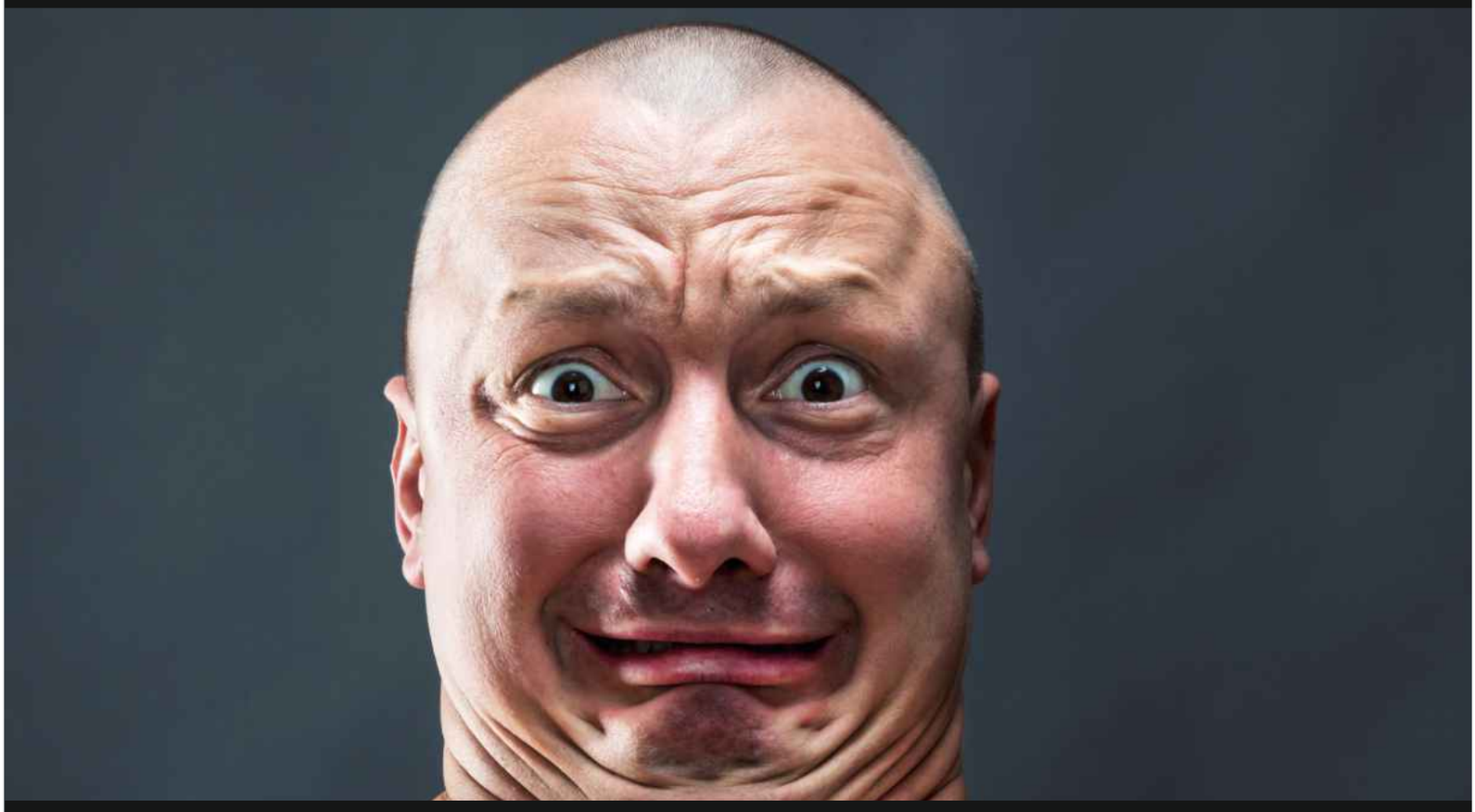
THAT FACE YOU PULL BEFORE



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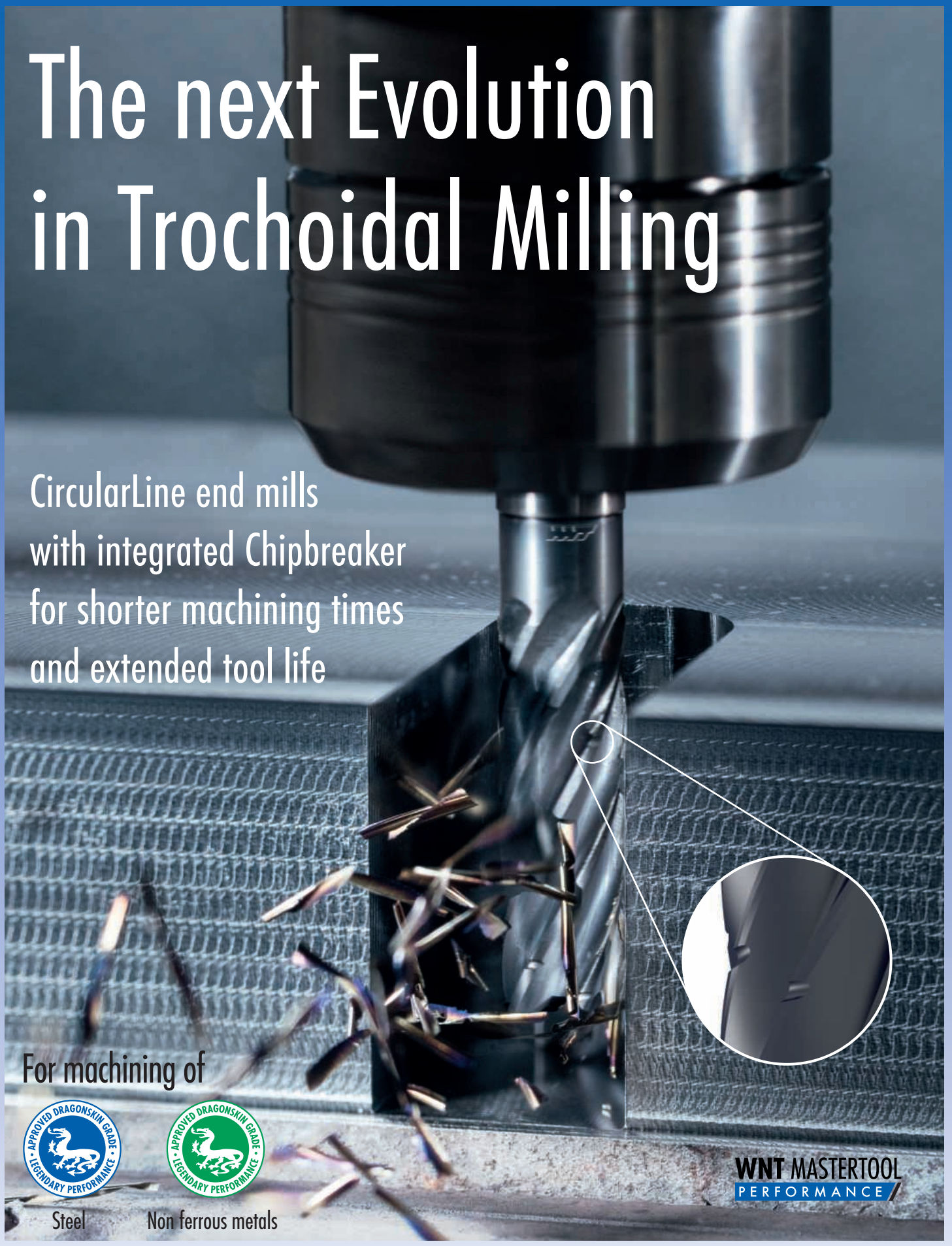

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