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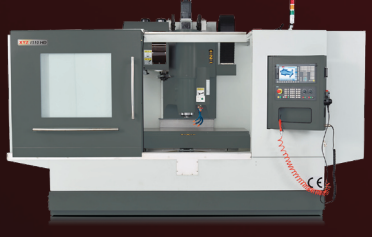
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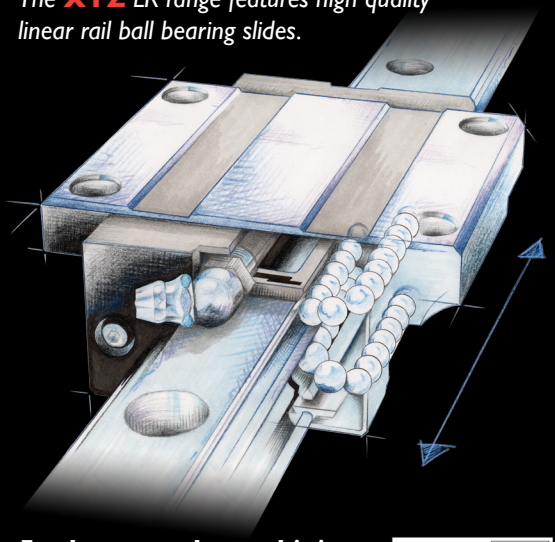

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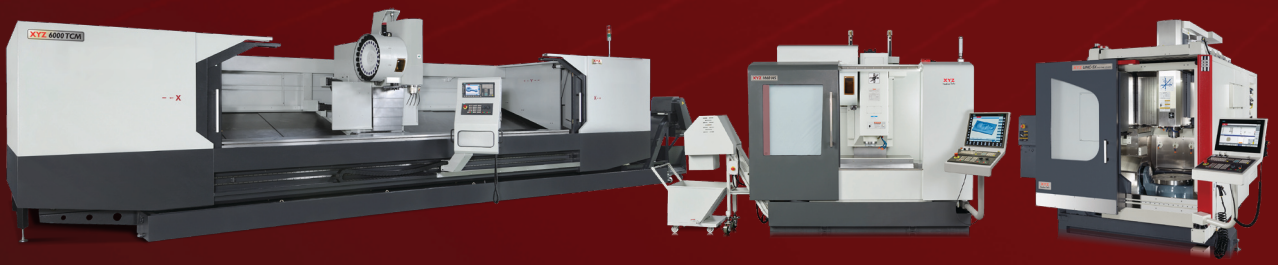

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Clamping circular parts?

If a component has at least one flat side, then securing it for a further machining operation, on a mill for example, is a lot easier than if the part is perfectly round. For the latter type of workpiece, clamping can be problematic, as there is a tendency for the component to slip and turn in the jaws. This is especially the case when more than one circular part is being held and when heavy cuts are being taken, which can result in lost production and scrap.

Soft aluminium jaws come into their own when clamping multiple round components, such as injection moulded plastic parts, as leading British manufacturer of plastic bearings and gears, Knaresborough-based BNL (UK), found out.

On its US-manufactured Chick One-Lok workholding devices, supplied by UK agent 1st Machine Tool Accessories, the jaws are milled to accommodate multiple round parts. As the shape matches perfectly, they are held securely and without damage. It is never necessary to over-tighten, which is an advantage when dealing with plastic components to avoid marking delicate surfaces. Job set-up for repeat batches is rapid, as jaw sets are stored for re-use.

Round plastic components secured in pre-machined, semi-circular scallops in soft jaws on a Chick One-Lok workholding unit at BNL (UK), Knaresborough

A further advantage is the speed with which One-Loks can be closed to secure a set of components. Unlike a conventional, wind-up vice, a ratchet system allows the movable jaw to be positioned instantly to within a few millimetres of closure, after which the clamping action is completed with just a few turns.

BNL supervisor Chris Hargraves said, "We machine up to 50 plastic components at a time on our Hurco machining centres and it used to be a time-consuming process. That is no longer the case with the One-Loks.

"The controlled clamping action produces a pull-down effect as the jaws close, so components are always seated firmly after the handle is tightened. Not only are workpieces secured faster, but accuracy, repeatability and safety are also improved."

For this and further customer applications, please read more on page 36 in the Workholding feature.

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A leap in technology at B-Tech Engineering

B-Tech Engineering, with its aerospace AS9100 certified factory in Bracknell, specialises in the manufacture of aerospace parts such as galley components and stowable tables for business class and first class cabins. The quality and finish of these high-end products is of paramount importance as is the service B-Tech Engineering supplies to its customers.

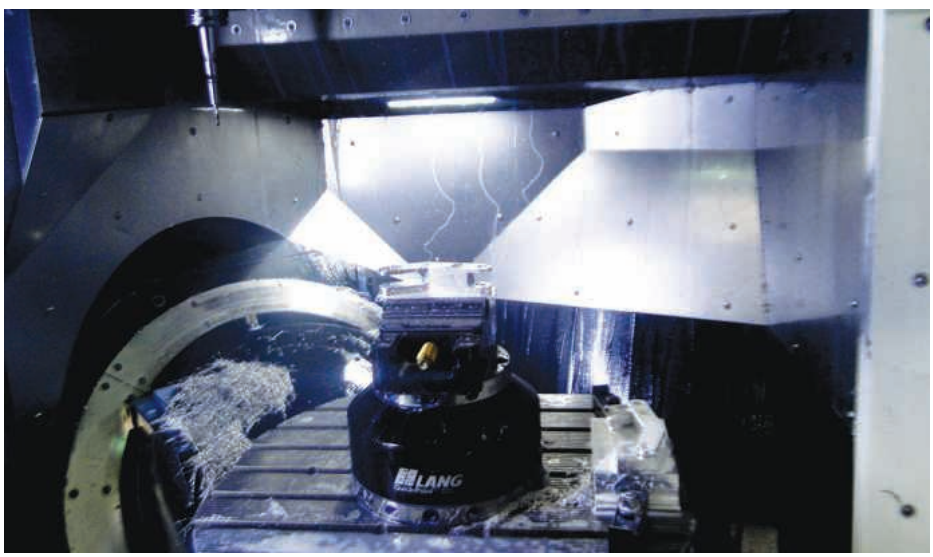
Currently, as well as the company's other machine tools, it has three DMG MORI NH5000 horizontal machining centres and one DMU 60 eVo linear 5-axis machining centre with CELOS®. It also has a second DMU 60 eVo linear, with CELOS and which is pallet changer ready, on order. This machine is set to be delivered within the next few weeks.

Brian Turner, managing director says: "We invested in our first DMG MORI NH5000 over five years ago, when we were located in Slough. Since then we moved to Bracknell, purchasing the premises and doubling in size to 7,500 sq ft. We are planning to double in size again as soon as we can. We have continued to invest in DMG MORI machines because of their reliability. We cannot afford to have downtime due to machine breakdown as we are running 24 hours a day. DMG MORI provides the reliability and service essential for our business."

As well as machining the aerospace parts, B-Tech Engineering assembles them in a controlled environment, the whole factory is air conditioned. Some of the assemblies are complex and can have up to 90 parts and require skill to achieve the required quality standard with no blemishes on the components, excess adhesive or air bubbles under the laminates.

Working with aerospace customers enables B-Tech Engineering to make parts for stock. Marc Turner, operations director says: "Our objective is to keep the machines running all the time, as that is when they are earning money and it is what they are designed to do. Although we may have more stock in finished parts than other companies, we achieve very high levels of machine utilisation and find that this is the most cost effective and efficient way for us to operate."

Migrating to 5-axis machining with the DMU 60 eVo linear machines is a major step forward for the company, especially for small batch quantities. Marc Turner says: "Setup times have been virtually eliminated with 5-axis machining. We use Lang Makro-Grip vices enabling us to clamp securely on a very small section of the billet, machine the complete part in one or two setups and break out a finished part from the finish machined billet." With CELOS on the machines and the PC version in the programming office, B-Tech Engineering can make tooling, setting and CNC data available at the machine, enabling the operator to check and be sure about the next job before machining starts. The company is able to cut two to three completely different jobs overnight and, because of the speed and ease of setting, it does not require a skilled person to operate the machine.



When using bull nose cutters, the job can be tipped so that the machine is not cutting with the end of the tool, which can cause 'pick-up' and hence marks on the job. Machining with the side of the bull nose produces a superior surface finish, important for the markets served by the company. B-Tech is also able to make use of trochoidal cutting techniques, machining pocket features with the full depth of the heat shrink tools it uses. Programmed in MasterCAM, the extra capacity delivered by the DMU 60 eVo linear has made it necessary to employ an additional CAM programmer.

B-Tech's customers appreciate the investments it is making. Marc Turner concludes: "With the large windows and LED lighting on the machines, customers can see their parts being machined. The advanced styling and design of the DMG MORI machines is an important factor showing that we are serious about our business. A recent opportunity made possible with 5-axis machining is the manufacture of guitars from solid aluminium. Our customer is working with some very high profile musicians, opening our eyes to other business possibilities thanks to the technology we have invested in."

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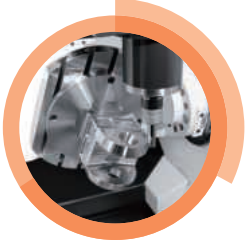

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Okuma launches new generation of machine tools

Okuma presented a new line of machine tools at the 28th Japan International Machine Tool Fair (JIMTOF) in November.The manufacturer's trade innovations included state-of-the-art 5-axis vertical machining centres and a new type of intelligent multitasking machine. Among the highlights was the introduction of the world's first multitasking machines capable of milling, turning, and grinding as well as laser-hardening and 3D metal printing

With smart factory, just-in-time-production, varying order sizes, production and machining requirements are higher than ever. To meet these demands, Okuma's latest machine tools take multitasking machining to the next level. The new models will be available in Europe in mid-2017.

Okuma's MULTUS U5000 integrates seamlessly into an IoT-based environment and enables gear machining in-house

Intelligent horizontal multitasking machine

To facilitate process-intensive production in a smart factory, Okuma has added the MULTUS U5000 to its line-up of multitasking machines. Designed for machining medium and large-sized components for the aerospace, energy and infrastructure industries, the MULTUS U5000 handles even difficult-to-cut materials, such as Titanium and Inconel. With the strongest turning spindle of its class, the MULTUS U5000 achieves unrivalled machining efficiency.

In an effort to allow operators to perform gear machining in-house, Okuma has made skiving and hobbing operations available on their multitasking machines with the accompanying software package enabling faster and easier programming.

With Industry 4.0 no longer a thing of the future, the MULTUS U5000 comes equipped with the latest generation of the OSP suite CNC control as well as Okuma's Intelligent Technology. These applications offer supreme connectivity and allow for a seamless integration of the machine tool into an "Internet of Things"-based production environment.

"Smart Machine" for 5-axis vertical machining

Designed to stand at the heart of a smart factory, Okuma's latest MU-S600V 5-axis vertical machining centre is able to instantly respond to changed lead times and accommodates production formats ranging from high-mix, low volume to mass production.

The compact MU-S600V has a very small footprint with a machine-width of 1,400 mm and is able to cut workpieces of up to 600 mm in diameter. The machine's compact dimensions and structural design allow for outstanding ease-of-use and easier crane jobs. Its robotic table enables completely unmanned, automated operations, eliminating manual handling of parts between set-ups in different machines. Production line layouts are easily adjusted in accordance with changes in production volume.

Laser technology for process-intensive machining

Designed to be the world's first "done-on-one"-machines, the Okuma MU-6300V LASER EX and the MULTUS U3000 LASER EX are capable of milling, turning, grinding, 3D metal printing and heat treatment for a wide range of workpiece sizes and shapes. On-machine hardening provides the solution to a major bottleneck in production. Compared to hardening by conventional heat treatment, the process is quick and causes less distortion, resulting in dramatically increased throughput. The machine tools fully support agile manufacturing and process-intensive applications.

With a high-quality TRUMPF laser beam source at its core, Okuma's LASER EX series enables stable laser processing over long runs. The machines allow for Laser Metal Deposition for both large-capacity and high definition additive manufacturing. 0.4 to 8.5 mm laser spot diameters enable unparalleled throughput regardless of the application. 3D moulding, coating and sectional repair of heat-resistant alloys and highly rigid materials are available on the machine as well.

The Okuma MU-S600V is designed to stand at the heart of a smart factory, accommodating production formats ranging from high-mix, low volume to mass production

Okuma's OSP control meanwhile monitors and controls the entire process, ensuring reliable and stable additive manufacturing for products on par with forged components. The machine tools therefore meet the quality requirements of even the most demanding applications and industries such as aerospace machining. Additional Okuma models with laser applications will be available shortly.

Okuma Europe GmbH is the Germany-based sales and service affiliate of Okuma Corporation, a world leader in CNC (computer numeric control) machine tools.

The Okuma MULTUS U3000 provides additive manufacturing solutions to meet the quality requirements of aerospace components

Done-on-one: Okuma's LASER EX series is capable of milling, turning, grinding, 3D metal printing and heat treatment

Founded in 1898 in Nagoya, Japan, the company is the industry's only single-source provider, with the CNC machine, drive, motors, encoders, spindle and CNC control all manufactured by Okuma. Okuma's innovative and reliable technology, paired with comprehensive, localised service protection, allows users to run continuously with confidence, maximising profitability. Along with its industry-leading distribution network, Okuma facilitates quality, productivity and efficiency, empowering the customer and enabling competitive advantage in today's demanding manufacturing environment.

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One-hit turn-milling

Single-hit production solutions are known to produce significant reductions in cycle times compared with multiple setups on several machine tools. However, few applications result in a time saving as great as that being achieved by Plymouth subcontractor, Morris Engineering, during the production of a military aircraft gyroscope part from S420 stainless steel bar.

Using a 36 mm capacity Biglia B436-Y2 twin-spindle lathe with two Y-axis turrets supplied by Whitehouse Machine Tools, the component is now turned and milled in a 7.5-minute cycle. Previously, it took ten times longer, one hour and 15 minutes, to machine the part on three separate machines. It involved a 3-axis CNC lathe, a CNC mill with a 4th axis and finally a manual lathe, which was needed to achieve the required surface finish in a face groove.

The 10-fold improvement is in cycle time alone. The former production route also required inter-machine handling, so costs associated with extra labour and administering work-in-progress are also saved.

Morris Engineering's production director Antony Dyer says: "The main problem previously was the limited spindle speed of our 3-axis CNC lathe.

"With the higher speed of the Biglia lathe and the ability to produce the part in one-hit, not only is the overall cycle time 10 times faster but we have also raised the yield of good parts by a fifth from 80 to over 95 percent."

Managing director Tim Winzer says: "The one-hit machining capability of the Biglia lathe has already resulted in our receiving an additional aerospace contract to produce another complex, stainless steel part for a military aircraft.

"We would not have won the job if we had quoted based on a multi-hit machining approach; in fact it would have been pointless quoting at all.

"Now we intend to leverage our economical, one-hit turn-milling capability and our AS9100 accreditation coupled with our bronze award in SC21 supply chain management to pursue civil aerospace work at tier 2 or tier 3 level, which we are actively seeking.''

Two-machine strategy

The B436-Y2, delivered in March 2016, is one of two Italian-built Biglia turn-mill centres purchased from Whitehouse Machine Tools. In January this year, a twin-spindle 465 T3Y3 with three Y-axis turrets was installed after Morris Engineering discovered that it could purchase both machines for the price of a single lathe offered by a shortlisted competitive supplier.

So instead of having one big lathe producing components from 6 to 65 mm in diameter, smaller parts up to 36 mm diameter are efficiently machined on the nimbler B436-Y2, while larger parts go onto the 465 T3Y3. This strategy has the added advantage of deploying two machines

rather than one, doubling productivity, and also provides redundancy in case of downtime on one of the machines.

Both Biglia lathes are employed for the production of a family of five stainless steel gyroscope parts in batches of around 200-off, the previously mentioned component being one. Three are turn-milled on the smaller lathe, one on the larger machine, while the fifth can be produced economically on either.

LNS Quick Load Servo 80 magazines for one-metre bar were supplied by Whitehouse Machine Tools for feeding both turning centres as part of the turnkey packages.

A twin conveyor arrangement on the output side of each lathe directs machined components onto a second conveyor at right angles to the first, carrying them into a container at the front. However, by the time a bar remnant arrives on the first conveyor, the control has already told the second conveyor to reverse direction so that the bar end is routed to another container at the rear.

The extensive milling and drilling capability of both lathes has resulted in a dramatic lowering of the workload in the milling section in Plymouth. It has consequently freed a lot of capacity, so much so that the subcontractor recently sold an ageing vertical machining centre and decided not to replace it.

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Javelin prepares Newmont for upping a gear on Alphacam parts

A specialist precision-gear manufacturer says full traceability of its aerospace components programmed by Alphacam CADCAM software will become even more important in the next few years.

With over 75 percent of its work being for the aerospace industry, Newmont Engineering says the Javelin production control system will help keep administrative and paperwork costs down.

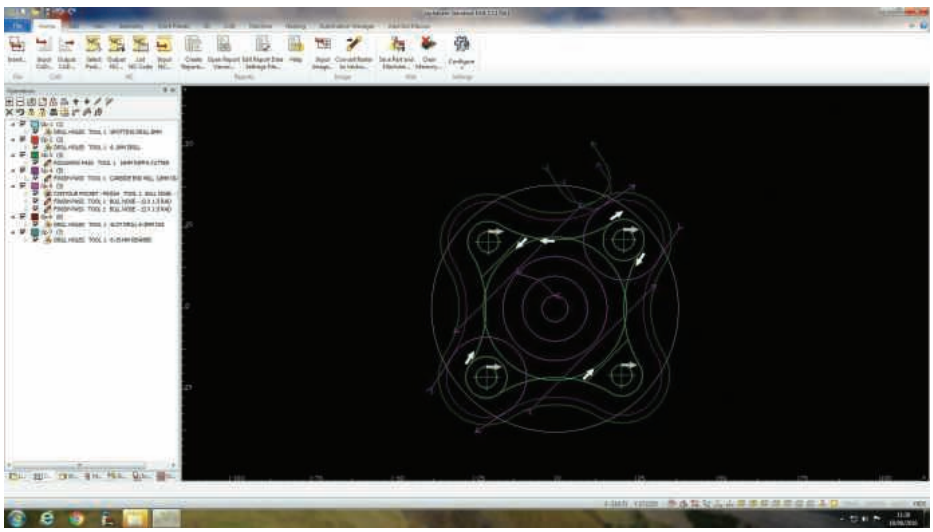
Managing director Rob Davies says: "The amount of paperwork that has to follow a part has quadrupled in the last decade, and will continue to rise as the industry reviews its standards and looks for even more traceability. Javelin stores all the information we'll ever need for every aspect of traceability. We can see at a glance where the material came from, what batch a product belongs to, who worked on it, and who shipped it."

It also allows them to capture information and report in real time on everything they produce. Tablets with barcode scanners have been installed in five of the main sections on the shop floor in turning, milling, grinding, gear cutting and deburring.

Rob Davies says: "All our Works Orders (WO) now contain barcodes, and engineers simply scan the barcode. The WO contains the sequence and layout of all work required to turn the raw material into a saleable component and all routines and operations are documented in it."

The manufacturing of precision gears to tight tolerances is a niche market. The combination of the Javelin MRP system and Alphacam CADCAM system, also from the Vero stable, allows Newmont to offer a more professional and controlled manufacturing process. With Alphacam driving a number of CNC machines, including a new Haas VF1 vertical mill, an Okuma Genos 460, Fadals, VMC Mills as well as Okuma, Citizen and Haas lathes, the company has been able to speed up both programming and cycle times.

CADCAM programmer Owen Lambert says: "We get a pack with the drawing and specification, then generate a drawing in Alphacam. From there we pick the specific cutting tools and create toolpaths, before simulating it to ensure the component can be cut accurately from the billet with no collisions."



Alphacam programs the gear blanks on the mills and lathes before specialist machines carry out the gear cutting process.

Newmont frequently use Alphacam to generate cycle times used in producing accurate quotations, which fit in seamlessly with Javelin.

Owen Lambert says: "We use Javelin's estimating and quotations function for quick estimates as well as full formal quotations. With the history of our parts being stored in Javelin we can see how long it takes to make both that specific component, and previous similar parts. With Alphacam providing programming and cycle times, we are able to produce an accurate figure for the customer."

The company's precision gears are largely manufactured from a variety of steels up to around 50 Rockwell hardness, plastics, aluminium, brass, tufnol and composites. They have a variety of uses, including controlling solar panels in satellites which accurately track the sun's rays. Newmont

also produces yokes for aircraft, connecting blocks for aircraft wiring, fuel injector components, and parts for drones.

With so many diverse individual components required by a number of customers at a variety of times, the company rely on Javelin's powerful scheduling function.

Rob Davies explains: "We're able to capture manufacturing times of components and provide KPIs to measure the performance of the business. It gives us complete control of the manufacturing process and enables us to be highly competitive in an increasingly global market place. Everything revolves around efficient scheduling, so it's key to our business. We generate a crystal report with pick lists from that module, which shows all timescales. Each component has between 10 and 30 operations, and everything is scheduled within the required timescale. Scheduling is the bane of any subcontractor's life, if it's not right nothing would get out of the door on time. Javelin manages our complex scheduling, and helps us to manage the conflict of priorities and production deadlines."

In 2015 Newmont upgraded from Jobshop to Javelin and have been running 'shop floor data capture' since January 2016. This reduces administrative time considerably as it keeps track of time recorded against every job.

Javelin's costing function is particularly valuable to Newmont, as costing is one of the most difficult things to calculate.

Rob Davies says: "Our versatile and skilled engineers move from one machine to another, even from one section to another. If a cycle takes five minutes the operator will move on to do something on another machine, so the task of getting an accurate overall total cost of a job, taking manpower and workcentre costs into account, is a real challenge and would be impossible without Javelin.

"If the cost is too high we won't get the job, and if it's too low we'll make a loss. Javelin ensures each job is accurately costed."

Overall, Rob Davies says the flexibility provided by Alphacam and Javelin means Newmont Engineering can continue to compete in its niche market while looking to expand and diversify. The company, which began in 1955, invested £2 m in 2013 to move to its 12,000 square foot premises in Isleworth, West London, and currently operate with a total of 36 staff.

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The next big thing?

Mills CNC reports that Doosan Machine Tools' large-capacity BM-series of double-column machining centres are in high demand.

Ask any component manufacturer about popular and proven large-capacity machine tools and a majority will more than likely mention Doosan Machine Tools' Puma lathes and DBC horizontal boring machines.

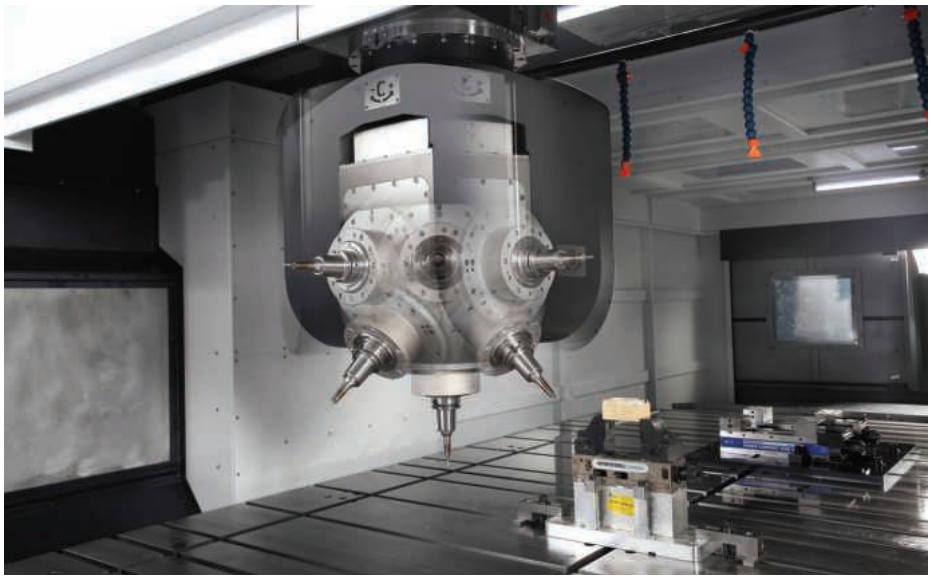
However, according to Mills CNC, the exclusive distributor of Doosan machines in the UK and Ireland, a new range of large-capacity Doosan machine tools is now occupying centre stage with UK and Irish large component manufacturers.

Judging by recent sales, these machines look destined to become the 'go to machines' for large component manufacture in the energy, aerospace and other heavy engineering sectors, as well as for the machining of large mould tool and dies.

Doosan Machine Tools' BM range of double column machining centres features big, powerful, rigid and high-precision machines.

There are three different sized machines in the range: BM1530M; BM2035M; BM2740M. Each machine is equipped with a low-vibration, built-in, dual-contact (ISO/BT50) 25/30 kW 12,000 rpm spindle. The spindles featured on the machines are long nose types which protrude 293 mm enabling them to machine deep pockets and cavities.

To ensure long-lasting precision, the BM machines are equipped with roller LM Guideways and linear scales on all axes, and feature a ball screw nut and bearings cooling system which, in conjunction with the latest thermal sensor technology, reduces the effects of thermal displacement.



Accuracy, as well as negating the effects of vibration, are further ensured by both the BM series patented base casting design and by anchoring BM machines to the floor during installation.

BM machines, irrespective of the model, have large Y-axis capabilities, up to 270 mm on the BM2740M, for increased flexibility, and their productivity potential is enhanced via their large quick-change CAM-type tool changers (40/60 tool capacity).

The machines are equipped with large working tables, up to 4,000 mm x 2,500 mm, and can handle heavy loads, up to 15,000 kg. They feature the latest Fanuc 31i-B control with the Doosan Easy Operation Package (EOP) for quick job setup and operation.

Tony Dale, Mills CNC's technical director, says: "Enquiries for our large-capacity BM machines have rocketed over the last few months and a significant number have turned into sales.

"From speaking to customers, it is evident that these machines were selected because they deliver the high process reliability and unrivalled machining performance that is customary with Doosan machine tools.

"Although we are only a few days into the new year, I'm delighted that interest in the BM range shows no sign of abating."

Mills CNC is one of, if not the, fastest growing machine tool companies in the UK.

It is highly-regarded and respected in the machine tool market and across all the manufacturing sectors it serves.

The company's reputation is built on the quality, reliability and performance of the Doosan machine tools it sells. These machines include the iconic Puma and Lynx lathe brands, equally popular and successful DNM and Mynx vertical machining centres, and DBC horizontal borers. This reputation is further enhanced by a range of quality services it provides and delivers. Ask any customer why they invested in a Doosan machine tool from Mills and they will invariably mention the before and after sales service as being an important and often decisive factor in their decision-making.

Mills CNC is an independently-owned company and its focus is only on serving customers in the UK and Ireland as opposed to Europe and/or the rest of the world.

Its independence means it can make decisions and respond quickly to changing market trends and conditions, and customer requirements.

Because the company only serves the UK and Irish markets, it has developed a good understanding of what customers need and want, putting all its resources into making sure it exceeds their expectations.

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Reaping the benefits of a Star investment

A subcontract manufacturer serving the automotive, medical, nuclear and agricultural sectors, Scot Bennett Engineering Ltd has just invested in a Star SR-32J sliding head turning centre. The new addition is the fourth sliding head turning centre from Star.

The company that initially bought two 20 mm diameter capacity Star machines has since added to the Star plant list with the third and fourth machines, both being 32 mm capacity for the machining of larger components. The fourth machine, a new SR-32J was delivered just before Christmas and the commissioning and staff training was conducted at the start of the New Year.

Referring to why the Kingsthorpe company invested in the SR-32J, managing director at Scot Bennett Engineering Ltd, Rob Bennett says: "We've always invested in equipment that will give us extra capacity on material and engineering capabilities. The 32 mm machine we bought this time was installed with an extended guide-bush collet unit that allows us to machine stock bars of 35 mm. We also specified high pressure coolant that allows us to work with difficult materials that cause swarf and chip problems, as well as deep hole drilling issues.

"We are already using bars up to the 35 mm capacity of the machine and the high-pressure coolant is being put into practice on softer materials that tend to be sticky. These materials have historically caused the swarf to wrap around the tools and drills. By breaking the swarf and evacuating it from the work envelope, we can run extended production volumes hassle free."

In fact, one of the primary reasons behind the purchase was the arrival of an EN3B steel job. Often difficult to machine, Scot Bennett has had issues with the breaking of swarf and the consequent evacuation. The small component that required external turning, grooving and internal drilling and threading was suffering from sub-standard surface finishes created by the swarf removal issue. The high-pressure coolant on the new SR-32J has completely eradicated this issue and is giving the ISO: 9001 accredited subcontractor surface finish values that meet the precision, quality and aesthetical demands of the business.

With a regular volume requirement from 1,000 to 2,000 off, the EN3B parts were previously machined on a fixed head machine in two operations. This would consist of front-end machining with the secondary operation consisting of a machine operator manually deburring the back-end of the parts and checking the quality of the threads.

With both front and back-end working, the 7-axis Star SR-32J has over 26 tool positions for the simple setup and machining of all material types and batch quantities that the Northamptonshire business produces. Regarding the configuration and running of the Star SR-32J, Rob Bennett continues: "It's a common misconception that sliding head machines are only suitable for long production runs. In the old days of CAM type machines, it would take a setter 6-10 hours to set up the machine. Nowadays, the FANUC control system enables us to set the machine in anything from one to three hours depending upon the complexity of the job. We recently ran a small batch of just 100 parts on the machine."

Going back to the EN3B part, Rob Bennett is confident that the proximity of the cutting tools to the workpiece and the elimination of secondary operations will drastically reduce the cycle time for the regularly running job.

He concludes: Whenever I have called Star, whether it's for sales advice or service and it sounds like a cliché, but I have felt like their only customer because the service is so good."

Star Micronics GB is the wholly owned UK and Eire subsidiary of Star Micronics Co Ltd, which produces sliding-headstock lathes at its ultra-modern Kikugawa plant in Japan with its headquarters located in Shizuoka.

The GB subsidiary, in addition to supplying its parent company's multi-axis, sliding-headstock mill-turn centres, is also the sole UK agent for the entire range of FMB automatic bar feeders and JBS compensating guide bush systems from Germany.

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Heating things up with Haas

Some of the most commonly employed manufacturing techniques have been used in industry for decades, sometimes centuries. Take, for example, induction heating. The phenomenon was discovered by French physicist Leon Foucault in the mid-nineteenth century. Induce an alternating current in a conductive object, such as a ferrous metal component, and it heats up. The applications, especially in modern manufacturing, are myriad.

Based in Piedmont, Northern Italy, Termomacchine Srl has been perfecting induction-heating systems for industrial use for more than 40 years. The company is still run by its founder, Bruno Gili who, despite being camera shy, is never reluctant to take the spotlight for the sake of his business and its 80 employees:

"We try to do as much manufacturing in-house as possible. Quality is everything for us, and for our customers, most of whom are very well-known companies, in Italy and overseas. We have departments for engineering electrical and electronic systems, mechanics, metallurgy, and quality assurance, of course. Our products are shipped to around 95 countries."

Most of the company's orders are for one-off, bespoke, turnkey machines and systems. So, there's little call for large batches of parts or, therefore, three-shift machining.

Bruno Gili says: ''We need versatile, simple, reliable machine tools. Speed is not particularly important and we're not competing with China or low-cost countries. We have a great deal of expertise, which we apply at all stages of a project, from sales to design, through to service and support."

Bruno Gili has worked with machine tools his entire professional life. In that time, he, like many of his peers, has seen the technology change beyond all recognition, from the advent of tape-based control, to primitive NC, to full multi-axis CNC. When he sings the praises of a particular piece of equipment, he doesn't do so lightly or without good reason.

Bruno Gili continues: "We bought a Haas DT-1 Drill/Tap machine. It runs 10 to 12 hours a day cutting aluminium, copper, stainless steel, and even plastic. It's a truly excellent machine and is always reliable and always accurate. It's a real jewel."

The company also has a Haas TL-2 Toolroom Lathe, which it bought for one particular order. Its latest acquisition is a Haas ST-30Y.

Bruno Gili says: "That machine has very useful capacity. Although I said we try to make everything in-house, there are some parts we still subcontract. With the ST, we can, hopefully, bring them back so we have more control over quality and delivery."

The ST-30Y is designed to provide heavy cutting ability, extreme rigidity, and high thermal stability. It has a maximum cutting capacity of 457 x 584 mm, with maximum swings of 806 mm over the front apron and 527 mm over the cross slide.

The ST-30Y also has high-torque live tooling and a servo-driven C-axis for 4-axis cutting. Bruno Gili repeats that versatility is key at Termomacchine, where each new order is different to the last:

"We don't make spare parts for stock. We'll make a new part when the need arises. It's about speed and the part being right the first time. We have 2,000 machines already in the field, so keeping a stock of spares would be impossible, very expensive."

Thankfully, Italy is a country with many companies just like Termomacchine: specialist, quality-obsessed, with an eye on the future but, just as importantly, with a trust in old, reliable techniques that may be uncelebrated, but never cease to be vital in modern manufacturing.

Haas Automation UK is the oldest, most established supplier of Haas CNC machine tools outside the USA. Haas UK was formed in 1991 and currently employs over 85 staff, 35 of whom are factory trained service engineers. The company is known for redefining the industry with its award winning levels of service and support.

The company has two main offices in Norwich and Leicester. Since late 1991, when the company imported the very first HAAS VF-1 into the UK, HAAS Automation has installed more than 8,500 Haas machine units and has won official recognition from California based HAAS Automation Inc. as the most successful international Haas distributor ever.

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Morris Engineering turns to Brother

A South West engineering company has invested in a new state-of-the-art CNC milling machine to become one of the UK's most cutting edge firms.

Bosses at Morris Engineering invested nearly three quarters of a million pounds in 2016 on new plant machinery to increase capacity and productivity.

The new Brother TC-32B replaces two older machines at the Plymouth-based company and has vastly improved the time it takes to make components for customers in sectors including microwave, aerospace and pharmaceutical.

The machine is believed to be the world's most productive twin pallet machine, with high torque, low inertia 16,000 rpm spindle and 70 m/min rapids.

Morris Engineering director, Antony Dyer believes the firm's investment will help future-proof the company for the rocky road ahead post Brexit:

"We have always tried to stay ahead of the game here at Morris Engineering because we understand how important it is to our customers that we continue to provide high quality components within a set time frame.

"Investing in new machinery is a vital part of what we do. The new Brother TC-32B replaced two other machines that were more than 15 years old.

"This machine can work in any material and its high speed and accuracy increases our capabilities and capacity, potentially opening up new markets for us such as the marine and medical sectors for example, safeguarding jobs and security well into the future, whatever it may hold."

Morris Engineering announced earlier last year that it had also invested in two bespoke Italian-built Biglia Lathes, the first of their type in the UK.

The company is now set to take on competition from around the globe as it continues to make everything from small prototypes to high volume machined parts, with dramatically increased productivity.

With multiple spindles the Biglia lathes can mill and turn simultaneously, cutting the time to make one particular mechanical component for the aerospace industry from

one and a quarter hours to just eight minutes.

Anthony Dyer adds: "We are always aware that we need to keep up with the latest in precision engineering and our most recent investments will allow us to stay ahead of the competition and continually diversify."

The company is planning further investment throughout 2017.

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ProtoTRAK is the control of choice at AC Engineering Services

In 1993, when XYZ Machine Tools introduced the ProtoTRAK control system to the UK, it was revolutionary, due to its ease-of-use and plain English programming system. Of course, being revolutionary also means a change in mind-set for customers, who up to that point had a limited choice of manual machines or highly complex, and expensive, CNC systems with their complicated G-code programming language.

The ProtoTRAK control system allowed many small businesses to move away from manual machines and take their first steps into CNC and after a number of generations the control remains the mainstay of XYZ's machine portfolio, with over 16,000 ProtoTRAK controlled mills and lathes installed in the UK.

Nigel Atherton, XYZ Machine Tools' managing director says: "Our ProtoTRAK range has been a revelation from the day it was launched, and it has been an extraordinary journey watching customers who had faith in it back when we launched it moving forward and becoming great companies in their own right." One such customer is AC Engineering Services based in Alfreton, Derbyshire.

AC Engineering Services is a general subcontractor and like many others it rarely knows what work it will be asked to do from one week to the next, or what materials it will be asked to machine. Managing director Dean Coxhead explains: "We work for a wide variety of industries. Being based in Derbyshire, we started out with a big reliance on the mining industry, but as that declined we now have customers from motorsport, aerospace, pharmaceutical and concrete processing. We can be working in plastic one day and Hastelloy the next, so versatility is the key word for us."

As an existing XYZ customer, AC Engineering Services was among the first to see the desktop demonstration of the original ProtoTRAK control back in 1993

Dean Coxhead says: "I remember that at the time Nigel Atherton didn't have a machine equipped with the control, just a desktop unit, but what my father and I saw during that demo convinced us that the control could revolutionise how we worked. Conventional CNC controls then had lots of buttons and a complex programming language, where the ProtoTRAK did away with all of that, making the whole process straightforward. We placed an order and took delivery of what must have been one of the first ProtoTRAK controlled mills in the country."

That machine is still there and operational and because of the ease-of-use and versatility of the ProtoTRAK control another seven machines have been installed, including a mix of turret mills, bed mills and lathes equipped with ProtoTRAK, along with an XYZ 1020 VMC vertical machining centre with the Siemens control. The most recent arrival is an XYZ SMX 5000 bed mill with the latest generation SMX ProtoTRAK control. The versatile machine is the largest in the XYZ bed mill range and has a table size of 1,930 by 356 mm with a maximum table load of 850 kg, a 5.75 kW (7.5HP) (40 – 5,000 revs/min) 40 ISO spindle with two speed ranges as standard. Axis travels are 1,524 by 596 by 584 mm (XYZ), with an additional 140 mm of quill travel.

Dean Coxhead says: "The ProtoTRAK control has been perfect for our business and has proved a very cost-effective option for the type of work and the skills that we have available. We are able to transfer people from one machine to another whether they are using the mills or the ProTURN lathes without any issues. Apart from the half day of training that I had back in 1993, we haven't had any other formal training on the control. There wasn't any need for it, as it really is that straightforward to use. Even as the control has been developed, the interface and functionality

from the operator's perspective has remained fairly constant, while the capability has moved on considerably."

The ProtoTRAK controlled machines at AC Engineering Services are used for a wide variety of components ranging from one-off to medium batch work and the versatility of the layout of the mill, in particular, has seen it take on work up to 10 m in length on occasions. The move to the XYZ ProTURN lathes was also taken with larger, longer work in mind and the choice was to bring in a ProTURN SLX 425 with a 2 m bed, which when combined with the 480 mm swing over the bed, an 80 mm spindle bore and 7.5 kW (10 hp)/ 25-2,500 rpm spindle with three speed ranges, provides an ideal solution for much of the turning work.

AC Engineering Services also has the more compact ProTURN SLX 425 with a 1.25 m between centre distance.

While Dean Coxhead's affinity to the ProtoTRAK control goes without saying, he did dip his toes into an alternative control system when the company was faced with more batch-type work. Here again he wanted an easy-to-use control system that would allow him to maximise the skills he had available from his six-strong workforce.

Dean Coxhead concludes: "We recognised a need for a vertical machining centre and because of the relationship with XYZ the choice of the 1020 VMC with the Siemens 828D ShopMill control was a fairly obvious one. We really liked the conversational programming of the Siemens control and it seemed like the logical progression having had the ProtoTRAK system in place. While we bought this machine to produce larger volume batches, we are still comfortable programming it for one-off and low-volume work if it is the right job for the machine."

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Mazak launches latest generation MULTIPLEX machine

Yamazaki Mazak has launched the latest version of its workhorse MULTIPLEX machines, specifically designed for high volume applications.

The W-200 series is the latest in the MULTIPLEX series that were first launched nearly thirty years ago. The new MULTIPLEX W-200Y + GL-100 offers a step-change in performance, due to the combination of two spindles, two turrets and a super-fast gantry loader for maximum productivity.

The two spindles enable continuous simultaneous machining with automatic workpiece transfer from one spindle to the other, due to the ability of each headstock to move towards the centre of the machine in the Z-axis.

The use of twin spindles enables the MULTIPLEX to reduce production lead time, operators, programming and in-process materials, all making the manufacturing process significantly more cost-effective and competitive.

In addition to the twin-spindles, the MULTIPLEX W-200Y is equipped with smooth mill drive turrets with integrated 5,000 rpm motors, which deliver improved milling and tapping performance, along with reduced chip-to-chip times.

Most importantly, the machine is equipped with an optional gantry loader that is capable of delivering a 20 percent reduction in load/unload time, with rapid movement in the A/B axis of 100/180 m/min for significantly reduced cycle times.

The MULTIPLEX W-200 series is also equipped with an innovative wedge bed-design that offers high rigidity and improved chip and coolant flow. Ergonomics play a significant role in the MULTIPLEX W-200 series design, with a large window, a new operator control panel that can be moved vertically and horizontally for optimum operator comfort, along with a small distance from the front cover to the spindle centre line for convenient setup. In addition, the gantry loader has improved access for loading and unloading.

The MULTIPLEX W-200 series is equipped with a bespoke compact SmoothG control panel, which offers reduced cycle time and improved accuracy. Touchscreen operations, similar to a smartphone or tablet, are allied to easy conversational programming for multiple surface machining, along with a range of fine-tuning functions that ensure easy configuration of machine parameters for different workpiece materials and application requirements.

SmoothG CNC also comes equipped with a number of intelligent machining functions, including intelligent thermal shield, variable acceleration control, smooth corner control and intelligent maintenance support.

Yamazaki Mazak Corporation was founded in 1919 in Nagoya, Japan and the company now has over 6,600 employees worldwide.

Yamazaki Mazak has nine existing manufacturing plants, with five in Japan as well as manufacturing operations in the United States, the United Kingdom, Singapore, and China. Products include multi-tasking machines, CNC turning centres, vertical and horizontal machining centres, CNC laser cutting machines, flexible manufacturing systems (FMS), CADCAM products and factory management software.

Yamazaki Mazak's new MUILTIPLEX W-200Y + GL-100 features two spindles, two turrets and a super-fast gantry loader for maximum productivity

Yamazaki Mazak UK Ltd
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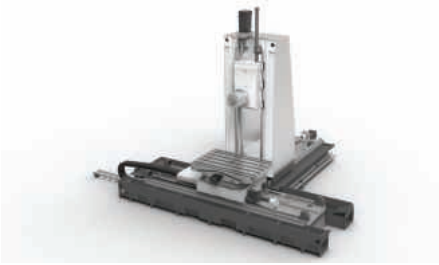
Heckert's solid rock horizontals

The combination of water-cooled main drive motors and ballscrews, plus a temperature-controlled structure, a natural granite machine bed and thermal compensation of the linear and rotary axes, has resulted in the Heckert Solid Rock machining centres, said to be the most thermally stable horizontal machining centres available.

These high levels of machine accuracy, says Starrag UK, result in unrivalled component quality and low tool wear, thus reinforcing Starrag's declared aim of 'Engineering precisely what you value'.

A positioning accuracy of just four microns in linear axes and only four seconds of arc in the NC rotary table, compared to six microns and six secs of arc on conventional machining centres, applies to the four machine Heckert HEC 1000/1250/1600/1800 models.

The four machines boast X, Y and Z axes travels from 1,700 mm by 1,250 mm by 1,850 mm (on the HEC 1000) up to 3,400 mm by 2,800 mm by 2,250 mm (HEC 1800).



The use of an innovative 'jacket' creates a machine base that is thermally insulated against ambient temperatures and internal heat sources, and a temperature control system guarantees to keep all structural components at a constant temperature, thus eliminating the chance of fluctuations between foundation and machine base and bed.

In addition, the granite bed offers similar static and dynamic properties as a steel version but no thermal disadvantages, it has a 50 percent lower co-efficient of linear expansion nor magnetic or corrosion issues. Also, the use of water-cooled motors and ballscrews ensures uniform heat control and, in terms of the ballscrews, excellent heat dissipation. Importantly, too, routines in the machines' CNC system include functionality that corrects any tool centre point displacements. Heckert's Solid Rock machining centres "are the most thermally stable horizontal machining centres available."

Starrag Group is a global technology company specialising 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 and energy, transportation and 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.

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Ajax launches robust new bed mill

Ajax Machine Tools has enhanced its portfolio of milling machines with the launch of the new AJCBM1000. The Ajax range of CNC bed milling machines has been designed to fill the gap between the machining centre and the tool room mill, and the new AJCBM1000 certainly fits the bill.

The structure of the new AJCBM1000 includes an extremely heavy duty bed casting and this build quality is also emphasised in the totally flexible turret head that is well suited for awkward cutting applications. The machine stability is noted in the near four tonne weight of the machine. By bringing the Ajax AJCBM1000 to market, the Hampshire based company is providing the industry with the perfect blend of a robust construction for more challenging tasks whilst offering exceptional precision levels and flexibility. With all the advantages of a full CNC machining centre, the AJCBM1000 can mill, drill, bore and tap without the confines of a fully enclosed work envelope. Furthermore, the machine can interpolate all 3-axis together for 3D milling applications.

Ian Fenton, UK sales manager at Ajax Machine Tools, says: "All our machines are Renishaw laser calibrated to demonstrate that every machine installed is calibrated to a precision level that is better than the +/-10 microns range that appears in some of our literature. In reality, the AJCBM1000 machines are closer to a two to three micron calibration level. A figure that is unheard of in the market where these machines are sold. We want to supply the best machines that we possibly can and the precision and build quality of the AJCBM1000 is unsurpassed in the bed milling segment."

Ideal for the job shop and one-off or small batch production subcontractors, this CNC machine offers an excellent capacity range at a remarkably competitive price. The AJCBM1000 has 1,000 x 500 x 500 mm movement in X, Y and Z axes. Capable of supporting workpieces up to 800 kg, the AJCBM1000 has an ISO40 spindle taper for heavy duty cutting whilst the 7.5 Hp motor

provides a high level of torque throughout the speed range of 50 to 4,000 rpm.

As with all machine tools from the Ajax stable, the AJCBM1000 is assembled at the company's Lymington headquarters where a team of experienced engineers provide a bespoke assembly service.

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TIBO delivers high-precision deep-drilling machines for the medical instrument cluster

By Benjamin Röcker, sales manager TIBO Tiefbohrtechnik GmbH

Baden-Württemberg in Germany is one of the leading locations for the highest quality of machine tools. The federal state has established a fantastic position in the area of medical instruments, which, like Swabian machine tools, have a reputation that extends well beyond the state borders. Tuttlingen in particular continues to enjoy respect as the global centre for medical instruments, and made a name for itself in the production of medical devices as early as the 19th century. Several hundred companies work in Europe's largest medical instrument cluster on innovative products for the medical industry.

One category of such instruments deals with traumatology or, more specifically, the products used for the treatment of bone fractures such as bone nails and screws. When fractures occur in hip joints and in the upper and lower extremities, bone screws may be used to compress the fragments and lock implanted intramedullary nails. These nails usually have two transverse bores by means of which the nail is secured with two screws against dislocation.

Why do bone screws require deep drilling?
When a bone fracture has to be fixed with plates, nails, or screws, a so-called guide wire is positioned in the bone at the point in question. This wire is used to push the bone screw with the deep bore, guiding it safely to the bone so that the orientation of the fracture compression can be precisely ensured by screwing in the screws.

TIBO Tiefbohrtechnik GmbH, based in the Swabian town of Pfullingen, established itself on the high-precision deep-drilling machine market years ago and is familiar with the high standards of quality in the medical instruments industry.

"We know all about the requirements of quality and precision in medical instruments and have no problem meeting our clients' demands because we use precision parts in our deep-drilling machines. We simply do not have any oversized machines – they are expensive, and their performance potential is far above what is necessary. At TIBO, the modular design essentially means that each deep-drilling machine is tailor-made, just like a tailored suit," says Benjamin Röcker, TIBO's sales manager.

One of the leading manufacturers of bone nails and screws from the Tuttlingen medical instrument cluster has found a competent partner in TIBO for designing its process. Because TIBO has built and delivered deep-drilling machines for other applications for this client in the past, it was clear that TIBO would be a competent partner for the bone screws that were to be planned; one who could offer a package solution and whose machines could fit into the compact on-site spaces. In addition, the client expressed the desire for workpieces to be loaded and unloaded automatically so that the system could be operated unmanned.

The framework conditions were a bore diameter of 2.5-5 mm with a drill path of 0.06 mm for up to 160 mm drill depth in titanium alloys (Ti6Al4V) and implant steel 1.4441. Solid carbide drills were used, in which the drill head and drill shaft are manufactured from a carbide blank. This increases the tool's rigidity and reduces the drill centring and any torsion fluctuation. The clamping sleeves that are soldered to the drill shaft transfer the torque from the machine to the tool. A high concentricity between the drill shaft and the clamping sleeve reduces additional vibrations and improves cutting capacity and process safety. Because deep drilling is the last machining level in the manufacturing process and the bone screws therefore already have their outer geometry,

workpiece machining and sealing of filigree screw threads and screw heads that have already been slitted are given special attention, so that the process returns reliable results with steplessly variable tensioning forces, coolant pressures of more than 160 bar, and solid carbide tools.

As early as the bidding phase, TIBO designers came up with a compelling tensioning concept. Because the wall thicknesses between the bores and the outer contour were as small as 2 mm in places and the screw thread and screw-in geometries differed greatly, special clamping sleeves that could be easily inserted into the deep-drilling machine's basic universal holders were constructed.

The E10 series deep-drilling machine selected from TIBO's modular system, with its vertical supply magazine for a total of 80 workpieces and gantry gripper for loading and unloading the deep-drilling stations, was able to fulfil these requirements. The intensive communication with the customer and the detailed analysis of the numerous workpiece drawings were extremely important for the design of the automation of loading and unloading, and for the necessary clamping equipment in the

deep-drilling stations. The process data storage devices integrated into the series' control units greatly facilitated customer setup of the wide variety of parts. Effective immediately, a single tap on the machine control unit's touch panel allows the necessary cutting data for every workpiece, including defined parameter monitoring, to be loaded into the control unit.

"Ultimately, it is our own desire to continuously reduce setup time, both for mechanical components and for machine control units, so as to remain the leading provider of deep-drilling machines," says Benjamin Röcker.

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A new twist on deep hole drilling

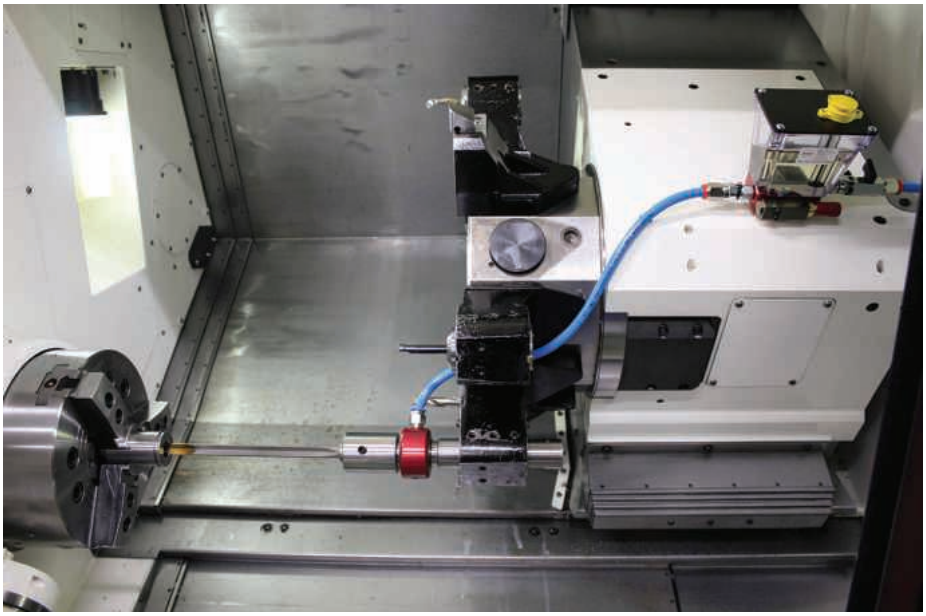
Mollart improves customer's deep hole drilling operations with gundrill and spraymist coolant system

By changing from a secondary operation using conventional twist drills following pre-turning when producing 3.2 mm diameter through coolant feed holes by 145 mm deep in M2 tool steel, a UK tooling manufacturer has adopted gundrilling as part of an integrated machining cycle on a Mazak J-200 Integrex Multi-Tasking turn-mill centre.

As a result, of adopting Mollart Engineering's recommendation to incorporate gundrilling and change to a single cycle method, cycle and lead times have been significantly reduced plus quality has improved by totally eliminating rejects and scrap due to lack of straightness which is now held to within 0.25 mm TIR.

As part of method improvement, not only did Mollart's application engineer recommend the change to single cycle operation for the production sequence using a Botek Type 113 solid carbide gundrill, but also introduced Mollart's own development of Spraymist system. As a result more efficient chip removal was achieved from the drilled hole and both the drill's guide/support pads and the cutting edge zone of the tool were lubricated.

The Integrex process involved the initial drilling of a pilot hole 8 mm deep to provide a 'bush' support for starting the gundrill. The gundrill was then fed into the pilot hole while counter-rotating at 50 revs/min until the drill point was within 2 mm of the bottom of the pilot hole, ready for the Spraymist to be switched-on. The spindle speed was then increased to 4,500 revs/min and a constant feed rate of 35 m/min applied to the final hole depth. The spindle was then stopped, the Spraymist closed down and the gundrill retracted.



Mollart Engineering's Spraymist coolant system demonstration unit showing gundrill in position at Chessington

Botek Type 113 gundrills are available between 0.7 and 12 mm diameter and can be used for depth-to-diameter ratios up to 80:1. Each tool has a special nose grind and has a highly polished flute with kidney-shaped coolant channel to ensure maximum evacuation of chips from the cutting zone.

The Mollart developed Spraymist system is highly efficient for deep holes, using compressed airline pressures up to 10 bar which absorbs precisely timed pulsed jets of vegetable-based cutting oil from an integrated reservoir. The system can be retrofitted to existing machine tools and to illustrate the increased efficiency, when a gundrill is removed from the component, it will be immediately cool to the touch.

The oil is used to lubricate the tip of the tool and its guide/support pads which prevents seizure occurring, especially in extra depth holes. Meanwhile the air effectively cools the cutting edge as well as the component and helps to force the swarf chips to evacuate the cutting zone through the vee grove in the tool.

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Hone-All drills into the upturn

During the 'sluggish' period for the offshore sector, Hone-All Precision Ltd employed a strategy of 'preparing for the upturn', a strategy that is now coming to fruition with order books at the Leighton Buzzard company starting to swell.

Part of the strategy of 'preparing for the upturn' has seen the Bedfordshire company invest in new staff to underpin the earlier investment in two TIBO Tiefbohrtechnik deep hole boring machines. This well-conceived strategy is now seeing Hone-All win business from historic customers that also felt the pinch of the slow-down as well as new customers that are keen to take advantage of the company's additional capacity.

The £650,000 investment in the two machines increased capacity and extended Hone-All's maximum boring capacity to 250 mm diameter with a length of 3.1 m. The addition of the deep hole boring machines was the perfect complement to the company's 4 m turning capacity.

However, the strategy has gone far beyond investing in new technology, as Hone-All director, Andrea Rodney explains: "Having the additional machine capacity and the larger dimensional capability has proven extremely valuable throughout the quieter periods in the offshore market, as it opened up new opportunities in alternative sectors such as the large capacity Hydraulics sector as well as the continued growth and expansion of our roller manufacturing business.

"However, equipment and capacity is only ever one aspect of ensuring excellent customer service and response. We have also strengthened our business by employing Craig Ruffett as our new operations manager who is focusing on process efficiencies and improved lead times, the most important factor for winning orders in some sectors right now. Furthermore, we have added a new quality control engineer to our team who has not only enhanced the quality and inspection process and but also allowed our current inspector to work more closely with goods-in and out departments. Both positions have been a factor in Hone-All now exceeding its previous target of 95 percent on-time delivery.

"By inspecting and gauging parts at goods-in, we can identify jobs with excess stock removal requirements prior to set up. This streamlines and prioritises our production whilst reducing downtime. The new appointments have enabled the management team to focus on alternate tasks such as faster quote generation and response, something that has further streamlined the business.

As a business, Hone-All is now leaner, faster and more responsive to market demands than ever before. Added to this, the company has greater machining capability and capacity than it did prior to the slow-down in the offshore sector."

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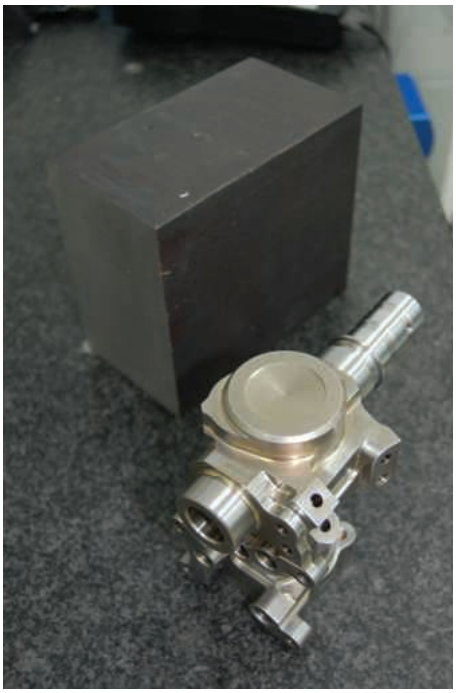
Walter cutting tools provide the competitive edge

The combination of Walter GB's tools and its Engineering Kompetenz applications, plus highly-sophisticated 5-axis machine tools, is enabling Columbia Precision to not only meet its aerospace customers' annual price-down demands but is also allowing the Birmingham-based company to compete with and win global business against competitors in lower wage economies. In one case, the use of Walter tooling is generating annual cost savings of an amazing 70 percent compared to former methods!

According to Columbia's operations director Ted Yarnall: "The integrity and the expert application of the Walter tooling is key to making annual savings on a host of complex aerospace workpieces and, over the past four years at least, has seen us reduce piece part machining costs to meet our customers' three percent year-on-year price reduction requirements."

A wide range of milling tools supplied by tooling expert Walter is used by Columbia to complement a host of top-of-the-range machines. Coupled with expert in-house manufacturing skills and 24/7 operation, the result is a formidable armoury of technology and skills that have kept the 54-employee precision machinist at the forefront of supply to companies in the medical, oil and gas, nuclear and ordnance, as well as aerospace sectors.



The use of Walter tooling on a stainless steel part for a Boeing 737 has eliminated tool presetting costs, reduced 'lost time' in tool changes and slashed machining times and costs

Columbia relies on an impressive portfolio of modern machining centres and turning centres, predominantly Matsuura, Mazak and Hurco horizontal and vertical machining centres and Mazak turning machines, plus milling tools from Walter.

These include the F4030 high-feed milling cutters with Screw-fit adaption, integral BT40 extensions and WSP45S inserts, which consistently generate considerable cycle time and tool cost savings.

The combination of best-in-class machines and tooling consistently enables Columbia to meet the trio of supplier demands that are centred on supplying workpieces of the highest quality, at the ideal price and on time, in batches that vary from one-offs through to components required at the rate of 60/week on five-year contracts.

Among the array of solutions that Walter GB has applied is tooling for a stainless steel part for a Boeing 737. Machined from solid on a Mazatech FH-480 horizontal machining centre, the use of a Walter F4030 Indexable Hi Feed cutter for roughing on the majority of the component, followed in the more inaccessible sections by a 16 mm diameter Walter H2EC ConeFit solid carbide milling cutter, Protomax Inox with Flash high-feed geometry and through-coolant ,are generating annual overall cost savings of 70 percent compared to the former tooling from another supplier.

Running at a lower speed of 2,069 revs/min compared to 2,407 revs/min, but at higher feed and feed per tooth rates than the tool it succeeds: 2,069 mm/min rather than 481 mm/min and 0.25 mm compared to 0.10 mm; widths of cut and cut lengths per pass remaining the same; Walter Protomax Inox tooling: reducing tool presetting and tool change times; increasing parts per insert edge, 37 compared to four; boosting tool life; machining 325 m rather than 35 m; achieving a much higher volume of metal removal of 16 cm^3/min compared to just 3 cm^3/min.

The use of the Walter tool on this task alone has effectively eliminated tool presetting costs, reduced 'lost time' in tool changes and slashed machining times and costs, to enable hundreds of hours of capacity to be released.

Available in the diameter range 10 to 25 mm, ConeFit is a modular solid carbide interchangeable head milling system that combines a solid carbide changeable milling head with a steel shank. Solid carbide shanks and HSK63, SK40, Capto C5 and C6 monoblock adaptors are also available.

Tooling supply is a slick business at Columbia, with a Walter GB distributor Matrix Tooling Services, Nottingham regularly topping up consignment stocks to a pair of vending machines. Matrix's supply is supplemented by Walter GB's technical input whenever the need arises.

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WNT generates more forward motion with propeller project

As the titled sponsor of the WNT F2 powerboat team, WNT (UK) has been applying its cutting tool knowledge and machines at its technical centres in the UK and Germany to create replacement, lightweight, components to reduce mass and increase speed. As the team prepares for the 2017 season, thoughts turned to propulsive power and a redesign of the boats propeller. A combination of design, 5-axis machining and the latest in cutting tool technology has produced a supercavitating propeller to improve acceleration and top speed.

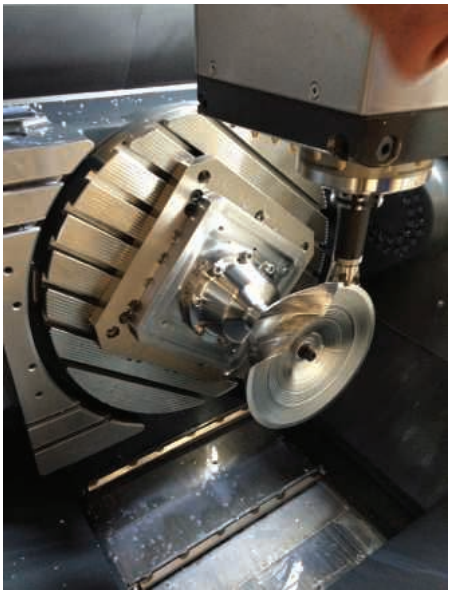
In F2 powerboat racing, the propeller is crucial, as it is the sole transmitter of power from the engine and if the design is wrong it can have serious impact on performance. For example, if the pitch is too small the boat will accelerate quickly, but not achieve the required top speed. Vice versa, if the pitch is too large, the boat will accelerate too slowly but will eventually go fast. The design of the propeller can also affect the handling of the boat by introducing rear lift, for example. Teams will create individual propeller designs within the parameters of the F2 rules, which state that it must have four blades and a 265 mm tip diameter. Beyond that teams can be inventive as far as pitch is concerned.

With the aim of reclaiming its British F2 Powerboat title in 2017, along with competing in selected rounds of the World Championship, Team WNT F2 decided to review its own propeller design that it could test over the winter close season. A new design with top secret pitch detail was created using Autodesk's Inventor and its Coil Function, which created a shape that would provide ideal forward motion when the propeller was in the water. The complex form produced then had to be machined from tool steel provided by team partner Böhler. Team WNT F2 crew chief, Simon Watling explains the need for specialist steel:

"The speed that the propeller rotates at creates terrific pressure and wear, so the material has to be tough and wear resistant. The technical experts at Böhler chose one of their W360 high grade tool steel as the most appropriate for this application. Developed for dies and punches, it is ideal for applications where high hardness and toughness are required. I doubt they ever had F2 propellers in mind though."

With the material specified, it then came to the machining and, with the complexity of the forms, it was passed over to WNT's technical centre in Kempten, which has a 5-axis machining centre capability. The first operation was rough turning, which reduced the original billet from 73 kg down to 30 kg. With the bulk of the weight removed the part was transferred to a DMC650V 3-axis machining centre for further pre-machining.

To aid cutter access, the part was clamped using WNT's new magnetic plate along with its PNG zero point system. The external



5-axis machining of the propeller

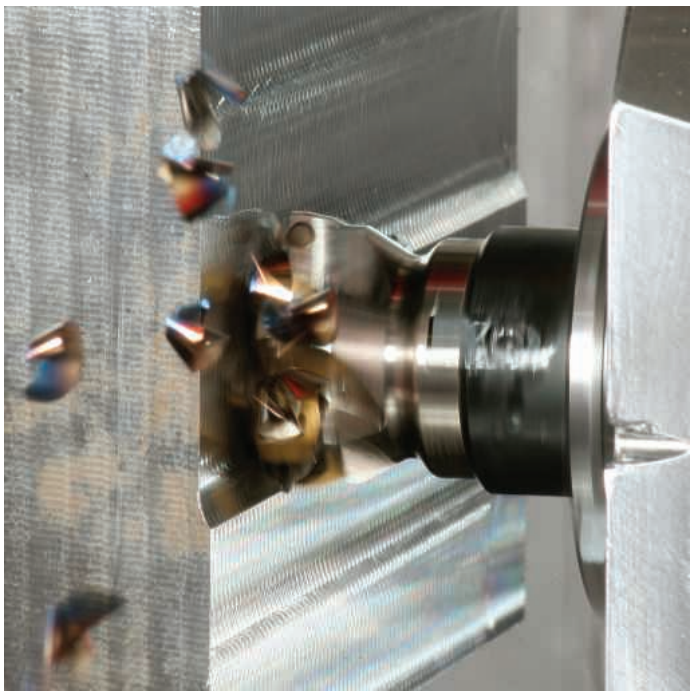
rough machining was completed using WNT's HFC insert milling cutters with HCN5235 grade inserts. For the initial internal work, a WNT C900 4xD Highfeed indexable insert drill and WTX Feed solid carbide drills were used, with the main bore profile finished with WNT's Digital Stick-System SpinTool. This digitally-controlled fine boring system from WNT removes any ambiguity when adjusting fine boring heads, with a clear indication of the exact adjustment shown on the screen.

Similar in size to a USB stick, the digital stick display connects to the fine boring head via a contact surface. The head is then

The team WNT F2 boat in action

WNT C900 indexable insert drills

adjusted in the normal way using an Allen key, but where normally the movement has either to be measured using a dial gauge or reliance on the head's vernier scale, the exact shift is now shown digitally on the stick and, as all of the electronics are contained within the stick and are powered by a single AAA battery, any imbalance in the head is removed. The units help control diameters down to 0.001mm increments on diameter.



WNT's HFC cutters in action

With the external features roughed out and the bores complete, the propeller was transferred to WNT's DMU75monoblock 5-axis machining centre. The part was clamped upside down on a special clamping arbor allowing the finish machining of the external form to be started. This was achieved using a combination of WNT's HFC insert milling system with HCN5235 grade carbide inserts running at typically 150m/min at a feed per tooth of 1.5 mm and a depth of cut of 0.4 mm.

Other tools used included WNT's 2011-11 milling system with XDKT grade HCN 5235 inserts, together with the WNT HSC-11 screw-in head type milling cutter. In this case, a head designed for aluminium machining was used to give the clearance required, due to the complex form of the propeller blade. Even with this situation, tool life was 1.5 hours with a cutting data of 140 m/min, 0.5 mm feed/tooth and 0.4 mm depth of cut. The final finishing cuts were undertaken using WNT's silverline ballnose cutter.

"This was a very challenging job, due to the extreme complexity of the blade form reducing tool clearance, but the WNT tools proved to be a good solution all round, even where we had to compromise due to clearances and use tools ideally suited to aluminium rather than tool steel," says Andy Kuklinski, technical business development manager at WNT Kempten.

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Drilling for profit with SUMO3CHAM

The global metalworking industry is driven by the relentless progress of high-end technologies that are becoming ever more sophisticated. The challenging requirements of today's advanced production equipment demand the provision of 'out of the box' advanced cutting tool solutions. Innovative cutting tools release the latent productive capability of modern machine tools and help to deliver enhanced profits to users, according to David Jones, Iscar UK sales manager.

In order to comply with market demands, Iscar recently exhibited its next generation, indexable drill and further extended its comprehensive product portfolio with the launch of SUMO3CHAM, an advanced three flute indexable drill.

The innovative design of SUMO3CHAM raises users' manufacturing productivity to new levels by reducing machining cycle times by up to 50 percent when compared to the conventional two flute drills.

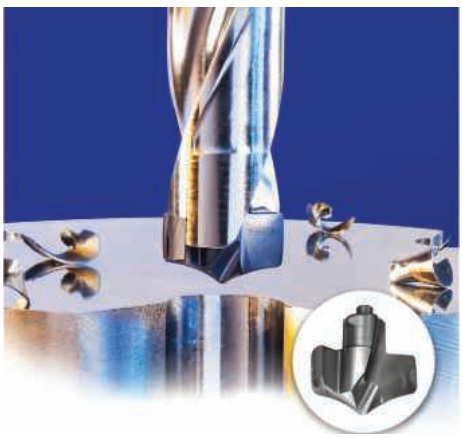
The advanced new product's pocket configuration is constructed on a 'close structure' design with three contact areas based on a dove tail joint. This extremely rigid clamping configuration divides the forces applied to the tools' pocket into three segments, dramatically reducing harmful influences on the pockets' lives and also substantially prolonging tool life.

In a similar way, the cutting forces are equally divided across the three cutting edges of the drilling head. The application of less pressure to each of the contact surfaces further extends the life cycle of the drilling head.

The combination of the self-centring geometry, along with a robust and accurate clamping system, results in SUMO3CHAM providing ultimate performance relating to bore cylindricity, roundness and enhanced productivity.

As the cutting forces are spread across three cutting edges, the drilling process becomes much easier, more stable and the penetration into the component's material remains more balanced. Users can therefore work up to twice as fast, as the feed per tooth can be increased significantly. Alternatively, users can maintain the same feed per revolution, as with a two flute drill, and achieve much longer tool life.

The SUMO3CHAM clamping, which relies on three points of positioning, provides high



levels of repeatability when the drilling head is replaced. Three radial and three axial stoppers secure the drilling head and ensure a reliable drilling process in high feed machining environments. Furthermore, due

to its sharp edges and the low axial force it applies, SUMO3CHAM is very efficient when drilling a through-bore. When the drill breaks through a slanted surface, for example, it also creates fewer burrs on exit. Since the material work hardening is low, a reamer or a tap which may be used for a subsequent operation will gain from extended tool life and accomplish improved results.

The unique geometry of the SUMO3CHAM self-centering head shapes the produced chips optimally to allow smooth evacuation throughout the three high helix polished flutes.

Iscar maintains its proud tradition of designing highly-efficient, user-friendly drilling systems. These unique products eliminate the use of tightening screws to clamp the drilling head in accordance with the company's motto 'No Set-up Time."

SUMO3CHAM is now available for machining alloy steel, carbon steel, soft and gummy low carbon steel and cast iron.

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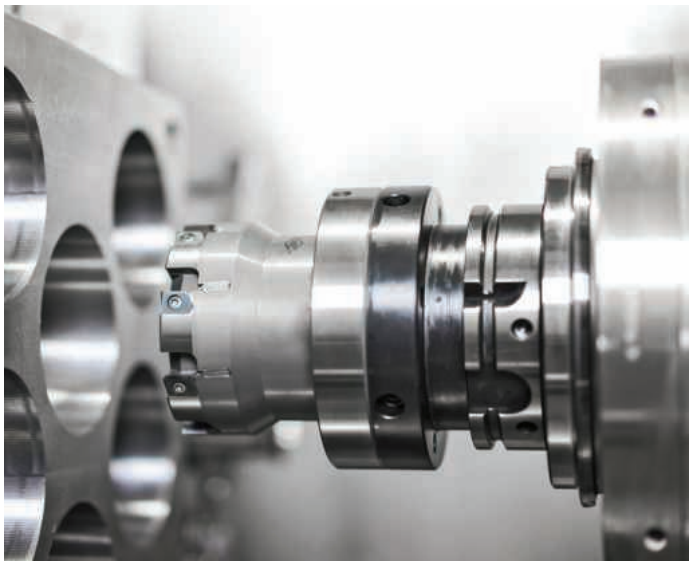
New Mapal HPR400 offers fine machining of large bores

In order to finely machine bores with large diameters in a defined tolerance range, users are often faced with the option of reaming or fine boring. On one hand, multi-cutting edged reaming tools are extremely fast and are less sensitive to an interrupted cut. However, the reconditioning of reamers with fixed inserts is a complex process.



To simplify this process by reducing the quantities of tools in circulation and the subsequent logistics and even tool setting effort, MAPAL has developed the high-performance reaming tool HPR400. By incorporating high-accuracy insert seats, customers can replace the inserts of the HPR400 instantly using a torque wrench. Incorrect insert mounting is eliminated, as only one mounting position is possible and the inserts can be fitted in any pocket.

As a result, there is no setting effort and no need to send tools for time consuming or expensive reconditioning. With the new HPR400, customers only need to have the suitable HPR400 inserts from MAPAL in stock. The quantity of tools required will also be at a minimum, as tool bodies do not need to be reconditioned. With minimal effort and a low number of tools in circulation, customers can achieve extremely accurate bores with the MAPAL HPR400.

The principle of the HPR400 system can be combined with other processes and therefore be designed as a combination tool. The reaming tool has an internal coolant supply that distributes the cooling lubricant directly to the cutting edge. Furthermore, the design behind the HPR400 incorporates an unequal spacing of the insert seats and this ensures a quiet and smooth cutting process.

Inserts adapted to workpiece material and machining

The HPR400 is available from 50 to 315 mm diameter, with either a HSK configuration or MAPAL's own module adaptor. The HPR400 can be applied to almost any workpiece material, as the inserts are available in with variety of grades and geometries that can be adapted accordingly. MAPAL offers indexable carbide inserts with or without CVD coating or alternately there is a Cermet and tipped line that is offered with PCD or PcBN.

For unparalleled reliability when machining cast iron, MAPAL has developed the extremely wear-resistant HC419 insert grade with a CVD coating. This material has proven itself with high cutting data and exceptional tool life, whilst the CVD coating enables a very broad range of alloys to be machined. This is all the more important, as the further development of cast materials for thermal stability and lightweight construction is continuous. The HPR400 with the HC419 grade is already being successfully implemented by numerous automotive manufacturers producing everything from brake callipers and swivel bearings through to gearbox housings.

One automotive customer is applying the HPR400 to the machining of the main bore in a differential housing. Running on a GJS400 workpiece material with a tool diameter of 150 mm using eight inserts, the HPR400 is obtaining a tolerance level of IT7 with a high-quality surface finish. These results arrive from running the HPR400 at a cutting speed of 160 m/min with a feed of 1.6 mm to get an average roughness of Ra= 1.35 µm.

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ITC extends holemaking line with WIDIA reamers

The WIDIA Top Ream platform has now been added to the extremely comprehensive and diverse hole making portfolio that is available from Industrial Tooling Corporation (ITC). The Tamworth cutting tool manufacturer covers all your holemaking requirements and the addition of the WIDIA Top Ream supplements the holemaking range with an impressive hole finishing series of reamers.

The WIDIA Top Ream line is available in diameters up to 42 mm with a complete range of edge preparation processes and geometries available. The keys attributes for high hole quality are the concentricity precision, form and position and surface finish. While boring tools may well be the undisputed choice in all of these areas, they can also prove a method that has a long setup time. It's here that the Top Ream steps in.

Conventional carbide-tipped reamers produce good hole quality and are considerably faster than boring with an ability to reach much deeper than boring tools. However, reamers also have an Achilles heel, as the steel shank that is brazed with the carbide flutes has a thermal coefficient three times that of carbide. This makes it subject to growth during machining operations.

Additionally, sharpening these tools leads to less than desirable results whereby the mixture of carbide and steel wreaks havoc on grinding wheels. Providing a reground edge as good as the original tool is almost impossible. The WIDIA Products Group has addressed these issues and more with its new Top Ream carbide reaming solution. Instead of four to eight individually brazed carbide tips, the Top Ream uses a single carbide disc and brazed joint. This provides a strong connection that is virtually immune to thermal effects during machining operations.

WIDIA manufacturing engineer, Tom Bobos notes another important advantage of Top Ream's all-carbide tip: "Steel-bodied reamers tend to get banged up on the ends. The centre can get nicked or distorted, preventing an accurate regrind. With carbide, you always have a good centre to locate on. The result is a minimum of four 'like new' regrinds versus an average of three questionable ones.

"A single piece of carbide is inherently more stable and resistant to vibration. The through-hole style has an 18-degree left hand spiral that does a great job of pushing the chip forward. It really is best in class."

The Top Ream platform offers best in class carbide as well. The WIDIA WU05PR advanced reaming grade was developed specifically for the demanding tool wear and surface finish requirements encountered in most hole reaming operations. For example, tests performed over a total cut distance of 30 m in length

showed an ability to consistently maintain surface finishes of 32 µm in Ra (0.8 µm) in 4140 steel alloy and 64µ in Ra (1.6 µm) in gray cast iron, three times that of TiAlN-coated tools.

The Top Ream covers hole diameters up to 42 mm and the TRF shank-style starts at 14 mm, with the TRM modular tool offered from 20 mm and beyond. One of the best features of the Top Ream line is the TRM series' mounting mechanism. It makes simultaneous contact on the face and taper of the cutting head. Twist the locking screw and the reamer head pops out with no need for head to body orientation. This provides a strong, vibration-free and extremely precise reamer interface.

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Small boring tools available in high-performance variants

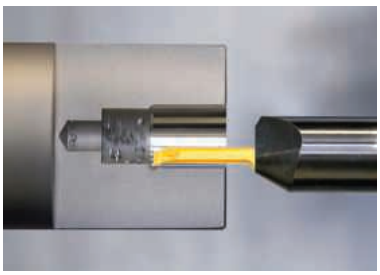
The 105 Supermini system manufactured by Horn is now available in new, high-performance versions for boring, internal grooving, chamfering, threading, broaching, facing and parting-off exotic alloys and steels, including those that are structurally inhomogeneous. User benefits include improved productivity and significantly increased tool life.

Featuring a new coating, substrate and microgeometry, the carbide inserts are designed to machine bores in demanding, highly alloyed materials from 0.2 mm diameter to 6.8 mm diameter. Standard lengths are from five times diameter at the smaller end of the range to a maximum of 35 mm. The Supermini system offers more than 1,500 insert types for a host of different applications. Right and left-hand versions can be used in one standard Horn Supermini toolholder, available with or without internal cooling.

Horn's high-performance 105 Supermini tool has a new coating, substrate and microgeometry

During development of the tool, a performance increase of 30 percent was achieved solely by modifying the substrate and keeping the coating and insert microgeometry the same. Horn then found that a sharper cutting edge resulted in higher metal removal rate and less cutting pressure. Although mechanical stress on the edge was elevated, the tougher substrate was able to cope.

A new coating system was devised, tailored to the combination of the tough substrate and the more durable cutting edge. It allows a denser layer of TiAlN (titanium-aluminium-nitride) with a more homogeneous structure to be deposited with excellent adhesion and improved smoothness. The enhanced anti-friction properties mean that less heat is transferred to the tool, so the cutting edge is exposed to lower thermal stress.



The tool is ideal for single-point boring and internal grooving

High-performance 105 Supermini tool life comparisons with existing substrates and coatings were carried out by Horn during extensive pre-launch trials. Results showed that using the new EG35 grade on cobalt-chrome, a popular alloy used in the medical sector, tool life was increased by as much as 60 percent. In the case of carbon steel, tool life more than doubled and when tests were carried out machining tool steel, the tool life increase compared to competitors' inserts was even greater.

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rose plastic UK celebrates 25th anniversary

rose plastic, a global leader in cutting tool packaging, this year celebrates its UK sales subsidiary 25th anniversary. In 1992, rose plastic AG set out with a vision to establish its first sales subsidiary outside of Germany and introduce its packaging technology to the UK cutting tool market. Over the course of the last 25 years, rose plastic UK made that vision a reality and has strengthened and distributed many new product categories, evolving into a UK leading supplier for cutting tools packaging.

Craig North, UK managing director, says: ''To this day, rose plastic UK is still driven by the entrepreneurial family spirit of our owners, which enables us to constantly push new boundaries and enter new markets. Our corporate strategy has enabled us to foster a culture of innovation, product development, from the initial design, production and finally to market. rose plastic today is more diversified than ever with unique product offerings that are sought after for their award-winning design, superior quality, and excellent value.''

rose plastic serves customers in more varied markets than many other packaging manufacturer and has expanded in to the fields of engineering component protection, DIY packaging and more recently medical packaging to standard ISO13485.

The company headquarters are in Hergensweiler (Germany) with factories located in USA, Brazil, China and India, rose plastic group has created a worldwide network of high performance factories. With sales and distribution points in England, France, Spain, Italy, South Korea and representatives in Poland, Japan and Turkey, rose plastic has established a global operation to provide optimum service and availability of rose products to all customers worldwide.

From precision tools to sweets, sawblades to tennis balls, masonry drills to thermometers, shock absorbers to surgical implants, ball bearings to bicycle accessories, machine parts to rulers, fountain pens to mailshots, there is hardly a range of products for which rose plastic packaging cannot be used, or for which it cannot find the correct packaging solution.

rose plastic continues to innovate and has just recently launched a whole new range of 'BlockPack' their latest version of its best-selling telescopic packaging tube.

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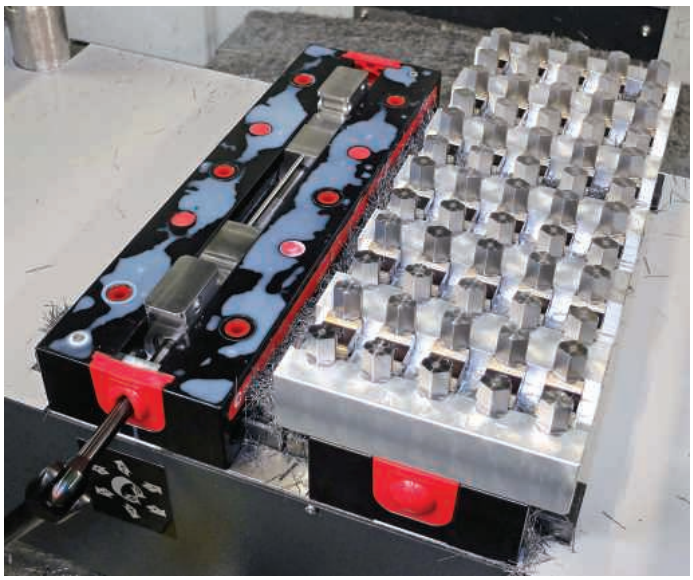
Clamping circular parts?

1st MTA has many economical solutions

One manufacturer that finds Chick products ideal for holding circular parts is turned parts subcontractor, Empire Manufacturing, Hoddesdon. One of its regular customers requires a lot of milling to be carried out on turned parts, too much for the sliding-head turn-mill centres on site to tackle economically.

Multi-loading of the EN16T steel dowel components was needed to reduce manufacturing cost per part, so the subcontractor turned to workholding specialists 1st MTA for a solution. After analysing the application, it suggested using two Chick Qwik-Loks, but not fitted with the standard, dual-station jaw sets. Instead, they are equipped with solid aluminium faceplates that act like zero-point pallet changers and repeat to within microns. With two machined recesses on the undersides that snap onto the Qwik-Lok slide assembly in the bases, the faceplates are secured in a matter of seconds.



60 steel dowels are held using specially machined Mitee-Bite clamps on a faceplate held by a Chick Qwik-Lok at Empire Manufacturing. The faceplate to the left has been removed to show the base and slide assembly, which is sealed against ingress of swarf

In this application, the faceplates incorporate Mitee Bite Uniforce machinable clamps, also from the US and sold in the UK by 1st MTA, which were machined with semi-cylindrical recesses to hold the dowel components after they have been turned and ground. Clamping of each component is achieved by tightening a single M6 socket screw.

Two faceplates securing a total of 120 components are presented to the spindle of a Leadwell V32i VMC and profile-milled in a 40-minute cycle. The faceplates are then removed and replaced with two identical faceplates that have been pre-loaded outside the machine with 120 steel dowel blanks whilst the machine has been running.

Stuart Wade, a director of the family-run subcontract machine shop commented, "Using two Chick Qwik-Loks with dual station jaws is not only an effective solution but an economical one as well. We were shocked at the £20,000 price of a zero-point clamping system we looked at early on, whereas the 1st MTA package cost only £8,000."

Thin-wall components held for vertical turning

Another application where distortion of round parts must be avoided during clamping is when turning thin-wall aero engine rings. Here again, 1st MTA has a highly productive solution, as Aston, Birmingham-based precision engineering company Columbia Precision discovered.

The arrival of a Mazak vertical turning lathe (VTL) allowed the subcontractor to take on extra work turning larger aero engine rings from Jethete, aircraft grade stainless steel or nickel-based alloy castings or forgings. However, the machine's three-jaw chuck was unable to hold the thin-wall components without introducing distortion, out-of-roundness and eccentricity.

1st MTA's applications engineers proposed an Abbott master plate, pre-drilled and keyed to accommodate three standard, curved segments that spread the clamping pressure evenly around the circumference of the rings, either by holding on the inside or the outside. The US-manufactured workholding system is able to maintain the required circularity and dimensional accuracy of the components, while the cost was well under half that of a multi-jaw compensating chuck offered by another supplier.

Different sets of three segments can be machined to accommodate a variety of component sizes and types. A set can be removed and three more segments bolted onto the plate for the next production run in less than half an hour, enabling high productivity to be maintained around the clock.

Colin Peach, the engineer in charge of the machine at Columbia concluded, "By clamping rings at 125 psi using the Abbott master plate system, we are easily able to hold the required dimensional tolerance of ± 0.1 mm and 0.15 mm roundness, which would be impossible using the VTL's standard 3-jaw chuck."

The Abbott master plate system with three curved segments set up over the 3-jaw chuck of the Mazak VTL at Columbia Precision

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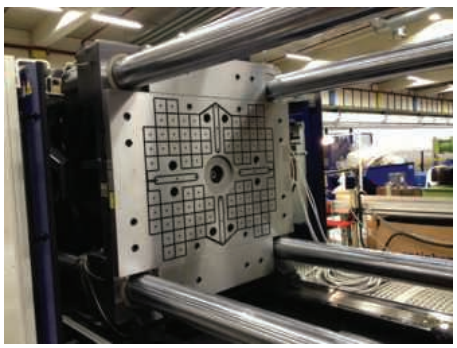
New rapid clamping system for automated press lines

Roemheld has launched the new Flexline rapid clamping system with push chain for the fully automatic clamping of dies of varying sizes on press rams. Thanks to its modular design and large number of possible variants, Flexline can be used on virtually all press models and for any die. It is suitable for initial installation or for retrofitting individual presses as well as for the automation of entire press lines.

The rapid clamping system can be combined with a range of clamping elements so that it can be used with dies of varying geometries and clamping edge dimensions. Numerous monitoring options, different adjustment tracks and versions for varying slot widths compliment the range of applications.

The core of the system comprises electro-mechanically driven push chains that automatically move the selected clamping element from the parking position to the clamping edge of the ram. The maximum adjustment tracks can be selected from 660, 820 or 1,100 mm. The central control unit applies the pressure evenly for all clamping elements and thus ensures uniform securing of the die.

The Flexline system can be fitted with hollow piston and spring clamping cylinders as well as sliding clamps. Both single-action and dual-action versions are available with maximum clamping forces up to 104 kN per clamping point. The spring clamping cylinder version is designed for the unpressurised long-term clamping of dies and is ideal for applications in high temperatures. Different diameters, operating pressures and clamping forces can be selected when using sliding clamps and hollow piston cylinders. Four different versions of the latter are available, including a compact, single-action cylinder with 90 mm diameter. At an operating pressure of 400 bar it can achieve a retention force of 104 kN. The larger cylinder with a diameter of 105 mm is self-locking and achieves similar clamping forces but at considerably lower pressures up to 245 bar.



The new Flexline rapid clamping system with push chain

The automatic motion sequence and integrated control systems ensure high operational safety. An inductive sensor signals whether the clamping element is in the parking position or securing position. Optional micro switches are available which indicate the stopping points and the end of the chain.

Flexline systems are available for four different T-slot widths. Both the die position monitor and the drive motor are attachable on either the left or the right. Roemheld can also provide customised solutions including versions for use in tight spaces or with different drives and clamping elements.

Modular construction makes servicing easier and enables short delivery times. In addition, Flexline is made up of standard components that can be easily replaced.

A video of the new Flexline can be viewed at https://**www.youtube.com/watch?v=v6o1WlYc48U**

To find out more about the new Flexline rapid clamping system with drive chain or Roemheld's full range of workholding and materials handling solutions, contact:

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

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Expanded range of toggle clamps

Latch-type toggle clamps, such as vertical and horizontal acting toggle clamps, have been a permanent feature of the Berger Tools product range for over 30 years. The expansion of the range of both type of toggle clamps make them the ideal solution for an even wider range of applications.

GN820.3 horizontal acting toggle clamps and GN851.3 and GN852.3 latch type toggle clamps have a new feature: an additional lock prevents inadvertent detachment caused, for example, by vibrations or incorrect operation. When the toggle clamp is closed, the additional safety hook automatically locks and holds the lever in a closed position. When required, the clamp can be opened, or detached through a simple, one-handed operation. The safety hook on the horizontal acting toggle clamps is operated by the index finger, while for the latch type toggle clamps it is opened by pressing from above with the thumb.

Now including spindle assembly with rubber tip

As before, Berger Tools horizontal and vertical acting toggle clamps cover all the bases. It offers horizontal or vertical mounting bases as an assembly kit or as a U-bar or solid bar versions. These components have long served as reliable standard parts. The possibility of including an adjustable spindle with a rubber tip is a new option. Until now, these had to be ordered separately as an accessory, for example as the GN708.1 standard part. The spindle assemblies included in the set correspond to the standard sizes most commonly used. Should a specific configuration be required, this can of course be ordered separately.

Along with the toggle clamp versions with additional locking as described above, spindle assemblies are also available for GN810 (vertical acting toggle clamps), GN812 (with dual flanged mounting base), and GN820 (horizontal acting toggle clamps), as well as for the GN860 (pneumatically operated) models.

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The ABC of workholding jigs and fixtures

Designing jigs or fixtures that hold workpieces securely, yet which also allow tool access and fast mounting and release, can be a complex undertaking. Designing and implementing the most appropriate solution, especially in high volume manufacturing environments, can have a significant impact on the cycle time of a production process, defining the efficiency of the operation.

Chris Putman, sales and marketing director for WDS Component Parts Ltd, one of the UK's leading suppliers of jigs, fixtures and other engineering components, shares his expertise:

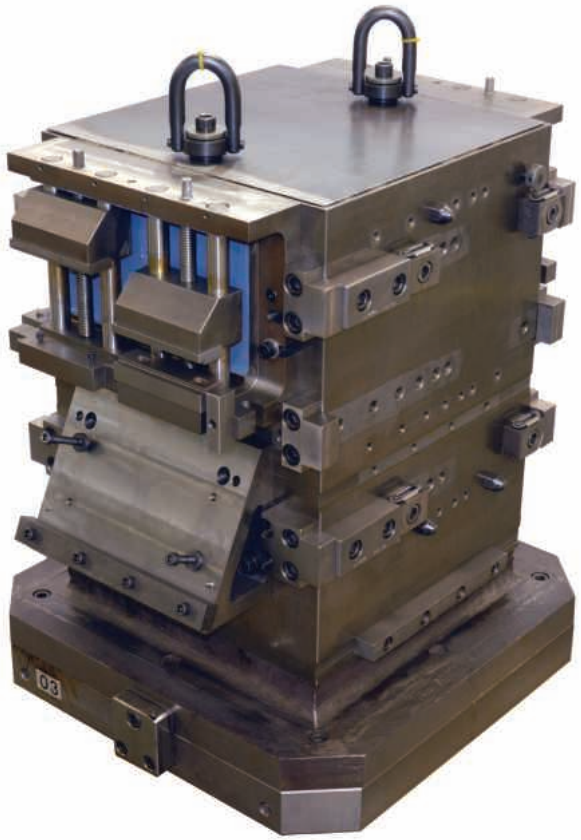
Considerable thought is required in the design of jigs and fixtures. There are several issues to be addressed and at times they may seem difficult to reconcile. Firstly the workpiece has to be held securely so that it does not move in any direction. However the fixture must not mark or damage the workpiece in any way. In addition, accuracy of positioning is always important; sometimes it is supremely important and tolerances will be expressed in micrometres.

As such, there is a general rule that mounting and releasing should not require high levels of specialist skills from the machine operator. There also has to be clear tool access to each surface which is to be machined. It may be necessary to consider 12 axes of movement: back and forth, left and right, up and down, plus clockwise and counter-clockwise in the X, Y, and Z planes.

WDS offers a comprehensive range of jig and fixture components from simple bolts and bushes to vices, clamps, location devices, grippers and integrated workholding systems. It also has a comprehensive offering of micro and precision options.

However, having such parts is only half the requirement. They have to be used to build a bespoke workholding system that will accommodate any required size or shape of workpiece. As such, workholding has to be understood as an analytical science, so that the best possible solution can be derived for any given job.

In fact, a simple, if slightly laboured, ABC-type aide memoire can be used to work through the main points of the design process:



A is for accuracy of positioning and access for tools;
B is for bespoke solutions built up from bolts, bushings etc;
C is for cycle times and complex shapes.

Jigs and fixture are usually made up from standard components, such as clamps, holding bolts and magnets. These are usually mounted onto a base plate and have to be assembled in a way that is suitable for each job, so every jig and fixture is, to some extent at least, bespoke.

As noted earlier, positional accuracy of the workpiece is of paramount importance, so careful consideration must be given to the way the holding components work together and complement each other's grip so that the fixture locates the workpiece precisely in relation to a fixed datum point. In highly repetitive mass production environments the fixtures may by electrically, hydraulically or pneumatically powered for rapid changeover. Significantly the actuating mechanism will need to be designed so that all the gripping elements work together to ensure that the workpiece is located precisely in position. In lower volume production, the fixtures are more likely to be manually set, but should still be foolproof when it comes to positioning the workpiece.

Whether it is high or low volume production, the force exerted by the fixture on the workpiece must be adequate to hold it firmly throughout the machining operations. Thus we can say that when designing a fixture it must be robust and rigid enough to withstand the forces it will be subjected to during production operations.

If the production operations are, say assembly or spray painting, the forces will be relatively modest, but metal cutting, extruding, interference fitting etc. may induce very considerable loads. If a workpiece is relatively delicate but is to be subjected to significant force, it may need to be held in a bespoke clamp or former that spreads the required holding pressure over a large part of the surface area. However the fixture holds the workpiece, it must allow clear access for tools, and possibly

personnel as well. Thus fixture designers must understand all the processes that are to be carried out, and how the necessary tools will be moved into position.

Significantly, safety also needs to be considered. If people are involved, consideration will have to be given to guarding, failsafes and other safety features. Even if people are well clear of the machining location, the design will need to ensure that possible failure modes and their consequences will not endanger workpiece, machine or nearby personnel.

Engineers always have to think about costs. Production engineers will know that the cost of manufacturing products is related in part to the total machining cycle time.

While machining times can be fairly inflexible, design of workholding fixtures can be optimised for quick and easy loading and unloading and this can have a significant effect on cycle times. A well designed fixture that enables correct and quick loading, clamping and unloading, and which does not hamper tool access can make a significant contribution to overall production efficiency and therefore to costs.

We should also look at the cost of creating fixtures. Naturally a fully bespoke solution is likely to be the most expensive option, a modular system considerably less so and a standard solution will probably be the lowest cost. These costs have to be amortised over the production volumes, but a well-designed fixture will bring advantages in terms of product quality, tool wear and operating life, which should also be part of any cost-benefit analysis.

Well-designed jigs and fixtures enable productivity and profitability gains by speeding up the mounting and demounting of work pieces. They also ensure product quality and machining accuracy, while improving the safety of metal cutting and other production operations. The use of standard parts will contribute significantly to controlling the cost of fixture design and production, and tapping into the expertise of a specialist designer, such as WDS, always pays dividends.

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Maximum flexibility and efficiency on clamping force blocks

The SCHUNK TANDEM TBA-D supporting jaw system transforms the SCHUNK TANDEM plus clamping force blocks into multi-purpose powerhouses. For the first time it is possible to cover the whole clamping areas with clamping inserts from the SCHUNK standard chuck jaw program for stationary workpiece clamping. Instead of several different special chuck jaws, with the TANDEM TBA-D supporting jaw system, the user just needs a few standard inserts, which can be quickly configured and are usually available from stock. This reduces both the investment volume and implementation time to a minimum.

Standard interfaces allow different variations for raw and finished parts as an option including gripper jaws, stepped jaws, prism jaws, soft jaws, jaws with pull-down, jaws with T-nut, and many more. The supporting jaws are assembled with four screws at the base jaw of the clamping force block, maximising rigidity. With the fine serration, its position can be varied in just a few simple steps. The SCHUNK TANDEM TBA-D is available in three sizes for clamping ranges from 8 to 70 mm, 18 to 120 mm, or 30 to 200 mm. It is suitable for ID and OD clamping on SCHUNK TANDEM plus clamping force blocks in sizes 100, 160 and 250.

High clamping force and repeat accuracy

SCHUNK TANDEM plus clamping force blocks develop high forces in confined spaces. A one-pieced rigid base body, wedge hook kinematics and long, ground jaw guidance provide concentrated clamping forces of up to 55 kN. They also ensure a repeat accuracy of up to 0.01 mm. This means that the clamping force blocks are also suitable for challenging milling processes with a high metal removal rate, high cycle times, and minimum tolerances.

The optimised outside contour and minimum clearance prevent the nesting of chips, and keeps chips and dirt out of the clamping module. Tight-fitting screws ensure that the clamping module can be changed at a high repeat accuracy.

The standardised powerhouse is available in several varieties: pneumatic; hydraulic; with spring or manually actuated in module sizes between 64 and 250 mm with a standard stroke or long stroke; or as a clamping force block with a fixed chuck jaw. They are suitable for top jaws with tongue and groove, but also for jaws with fine serration.

To learn more about the many possibilities, SCHUNK offers a free quick finder on its website **www.schunk.com**, which makes the search for the best clamping force block much easier. Five clicks is all it takes to find the tool suggestion for the matching modules.

Designer jaws increase efficiency in finish machining

The intelligent jaw design of the SCHUNK UVB-HS soft chuck jaws from SCHUNK, the competence leader for gripping systems and clamping technology, defines a new class of efficiency in lathe chuck technology. With a combination of overheight and angle cutting, it achieves a whole bundle of efficiency effects during finish machining of

With the SCHUNK TANDFEM TBA-D flexible supporting jaw system, a large variety of parts can be clamped on the SCHUNK TANDEM plus clamping force blocks without requiring special chuck jaws, saving time and money

With a combination of overheight and angle cutting, SCHUNK UVB-HS chuck jaws achieve numerous efficiency effects during finish machining, from a reduction in the processing time and energy savings during acceleration and braking to a reduction in the amount of aerosols emitted when the machine is opened

workpieces. The unusual jaw height allows for a larger clamping surface, which reduces deformations. Alternatively, the distance between the workpiece to the chuck face can be increased and thus accessibility can be optimised. In comparison to conventional monoblock jaws, SCHUNK UVB-HS reduces the jaw weight by up at least 20 percent, depending on the size. This increases energy efficiency and shortens the processing time, since the lathe chuck can be accelerated and braked faster. At the same time, the reduced jaw centrifugal force allows for higher holding forces on the workpiece, which means increased process reliability.

The optimised interfering contour of SCHUNK UVB-HS chuck jaws ensures precise and secure workpiece clamping. It minimises the danger of collisions and reduces both the level of noise and the swirling around of cooling lubricant

Improved fluid dynamics

But it doesn't stop there: angle cutting minimises the danger of collisions with the turret and improves the fluid dynamics during machining. At high speeds, SCHUNK UVB-HS chuck jaws lower noise emissions by up to 10 dB, which halves the level of the perceived noise. Since significantly lower cooling lubricant is swirled around the machining area, it is easier to see the machining process. This also lowers the amount of aerosols in the air when the machine is opened. The highly efficient monoblock jaws with angle cutting are part of the over 1,200 jaw types in the world's largest standard program of chuck jaws from SCHUNK. They are available immediately for wedge bar lathe chucks with straight serration in the sizes 200, 250/260 and 315 and can be turned individually to the desired diameter.

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Gewefa Grindtec toolholders feature zero run out

The newly introduced Gewefa Grindtec range of hydraulic chuck toolholders are purpose designed to work with bespoke tool grinding machines and feature a mechanism that enables adjustment of the run out at the tip of the (clamped) cutter to zero tolerance.

Highlighting the zero tolerance run out on the new Gewefa Grindtec toolholder

This is achieved by compensating for run out errors between the tool tip and the spindle with the cutter adjustment via three 120 ° radial screws located in a ring fitted around the toolholder body.

The cutter shank is thus slightly deformed to achieve absolute accuracy of its position at a distance 100 mm from the ring. As a consequence all run out errors can be eliminated from the tool tip to the spindle.

On the Grindtec, the radial adjustment screws are protected by a cover ring that clips into position after the adjustments are made.

Another important feature of the Grindtec is the design of the outside form which permits machining close to the cutter when used on grinding machines.

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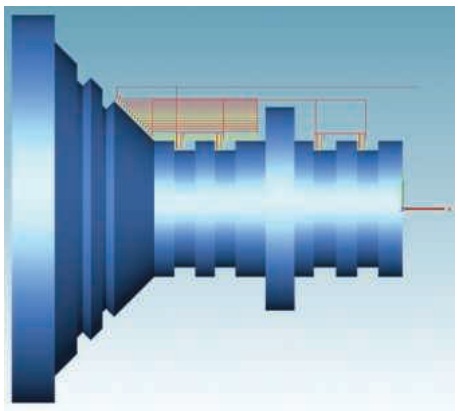
OPEN MIND presents hyperMILL 2017.1

New functions for mill turning

OPEN MIND Technologies AG has now released the latest version of its CAM system, hyperMILL® 2017.1. Users can now benefit from many new functions and optimisation tools that make programming faster while reducing auxiliary processing times when carrying out machining jobs. The software developer has also made crucial additions to hyperCAD®-S, its proprietary CAD for CAM solution. The software was launched in November 2016.

Manufacturing companies heavily rely on multi-functional mill/turning centres to optimise their machining processes. OPEN MIND supports this trend and has added many new mill/turning functions to hyperMILL 2017.1.

The extended chip break function for turning operations now allows the customer to machine hard and soft materials with more flexibility than ever before. New functions make it possible to remove chips safely for non-falling contours. The machining length can now be defined in combination with a short stop to break swarf. This ensures the workpiece is not damaged by swarf getting wrapped around the spindle. It's also possible to maintain high surface quality with the machining length defined in combination with a short pause. The user can select from two methods to specify the stop, define the dwell time or even the number of spindle rotations. Greater control of the chip break is now possible where the area to be machined is divided into multiple sections that are then machined in a specified order.



2.5D and 3D machining

The new release offers a number of new functions and expansions for 2.5D and 3D

machining. hyperMILL 2017.1 supports cutter radius compensation when using 2D thread milling and 2D helical drilling strategies. If the tool radius changes, hyperMILL automatically adjusts the programmed path. The user has two options for how this adjustment is made: the compensated path option or the compensated centre path option.

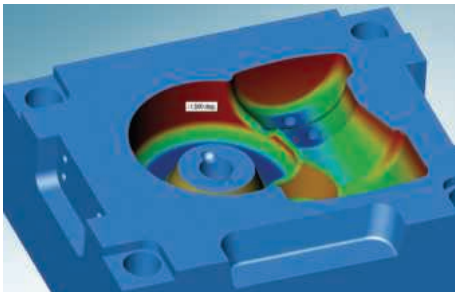
The new 3D cutting edge machining strategy is one of the highlights for 3D milling jobs. This strategy enables efficient machining, particularly for cutting blades, which are frequently used in tool engineering. Roughing and finishing operations can easily be generated via a 3D curve selection. The rest material machining is generated via the 'Reference job' option. Here, the rest material areas of the previous machining operation are also included in each case. Toolpath smoothing ensures a better milling result if the contours are of poor quality.

hyperMILL MAXX machining

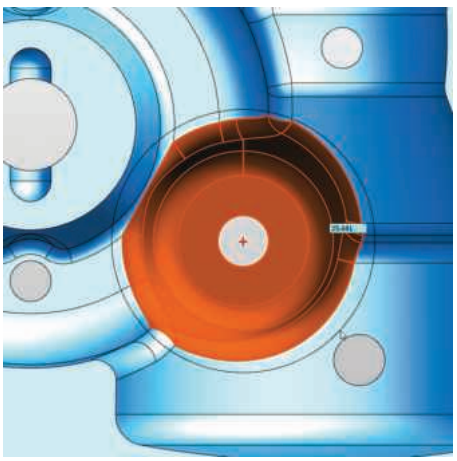
The new version also expands the scope of the hyperMILL® MAXX Machining performance package. hyperMILL 2017.1 allows the spindle speed to be adjusted in the plunge macro for roughing. Modifying the spindle speed and specifying a dwell time for the speed change ensure more tool-friendly machining. This option also increases process reliability.

5-axis swarf cutting with a curve

Users can now benefit from two new functions for 5-axis swarf cutting with a



curve. The perfect surface and equally perfect curve are created automatically for SWARF cutting based on a simple face selection. This feature automatically fillets interior corners, so the programmer can eliminate the input of additional geometries when pocket and fillet machining.



hyperCAD-S

Three basic improvements make the newest version of the hyperCAD®-S CAD solution stand out. This is the draft, curvature and selection function analyses. The new selection functions make selecting CAD elements particularly convenient. The new draft and curvature analyses help users quickly view and examine milling areas or radii sizes.

OPEN MIND is one of the world's most sought-after developers of powerful CAM solutions for machine and controller independent programming.

OPEN MIND develops optimised CAM solutions that include a high number of innovative features not available elsewhere to deliver significantly higher performance in both programming and machining. Strategies such as 2,5D, 3D as well as 5-axis milling/mill turning, and machining operations like HSC and HPC are efficiently built into the hyperMILL CAM system. hyperMILL provides the maximum possible benefits to customers thanks to its full compatibility with all current CAD solutions and extensive programming automation.

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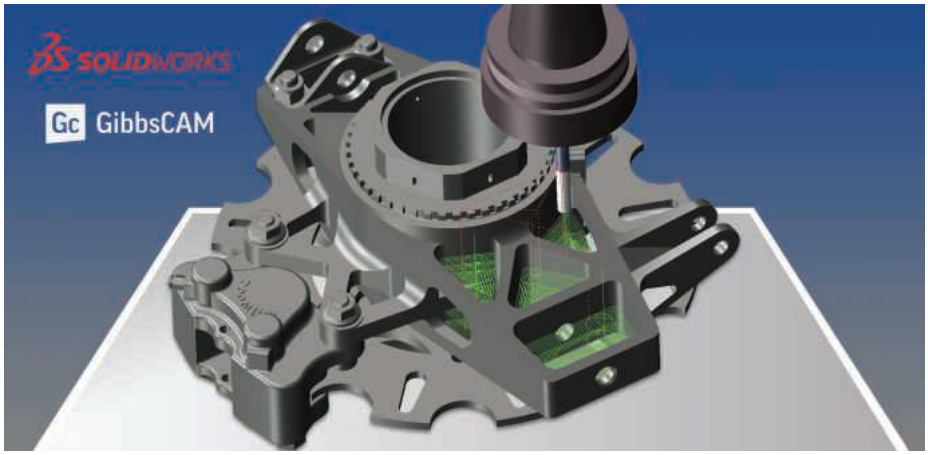
GibbsCAM 2016 is certified for SOLIDWORKS 2017



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

GibbsCAM 2016 is certified for SOLIDWORKS 2017 as part of the SOLIDWORKS partner product program, under which GibbsCAM has been a certified CAM product for many years. DS SolidWorks created the CAM certification to identify best-in-class CAM solutions with enhanced interoperability, assuring users that their solution can read the native SOLIDWORKS file format. GibbsCAM 2016 is immediately compatible with SOLIDWORKS 2017 per the requirements of the certification.

Certification also demonstrates a commitment to joint SOLIDWORKS-GibbsCAM customers, and ensures these customers can take advantage of the latest GibbsCAM enhancements to achieve the highest productivity from SOLIDWORKS 2017. In combination with GibbsCAM automation features, integration with SOLIDWORKS simplifies preparation for machining, and makes machining much faster, saving huge blocks of time for SOLIDWORKS-GibbsCAM users. GibbsCAM's short learning curve and unique, shop-friendly user interface provide additional productivity from ease-of-use, reliability, and speed of programming.

Interoperability with SOLIDWORKS

GibbsCAM directly reads SOLIDWORKS part models and assemblies, preserving features and attributes, such as holes and colour, and uses these characteristics to identify, organise and select features for machining. Alternatively, with the GibbsCAM SOLIDWORKS Add-in, SOLIDWORKS users can transfer files directly into GibbsCAM on the same workstation with the transfer to GibbsCAM menu option. GibbsCAM's optimisation for SOLIDWORKS includes integration of the GibbsCAM hole manager with SOLIDWORKS' hole wizard to identify, categorise, and machine simple and compound holes. This allows GibbsCAM's automatic feature recognition and feature manager to read and preserve features from the SOLIDWORKS feature tree to easily identify and select areas for machining. Whether parts have plain geometry needing only simple milling or turning, or complex geometry requiring use of 5-axis machining, multi-task machining or Swiss-style turning, the combination of GibbsCAM 2016 and SOLIDWORKS 2017 covers the entire design-through-manufacturing cycle in production machining across multiple industries.

GibbsCAM is an approved SOLIDWORKS solution partner and GibbsCAM 2016 software is a certified CAM product under the SOLIDWORKS partner product programme.

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

Tech CADCAM has been a GibbsCAM UK distributor since 1997 and has been bringing innovation to manufacturing industry since 1988. It offers a range of innovative and intuitive CAM software products which aim to be simple to learn and productive to use.

The highly-experienced team is able to assess customer needs and find the right combination of software, support and service to allow businesses to excel and achieve their full potential.

Tech CADCAM Ltd is committed to its customer's success using GibbsCAM. In addition to the GibbsCAM maintenance program, which ensures users have the latest version of GibbsCAM, there are a variety of support mechanisms available. Depending on the level and type of support that customers need, there's a GibbsCAM support system to help. Tech CADCAM also offers professional training to allow users to come up to speed on GibbsCAM as efficiently and effectively as possible. The classes provide a good foundation for brand new GibbsCAM users, or can be used to enhance or expand the skills of existing users.

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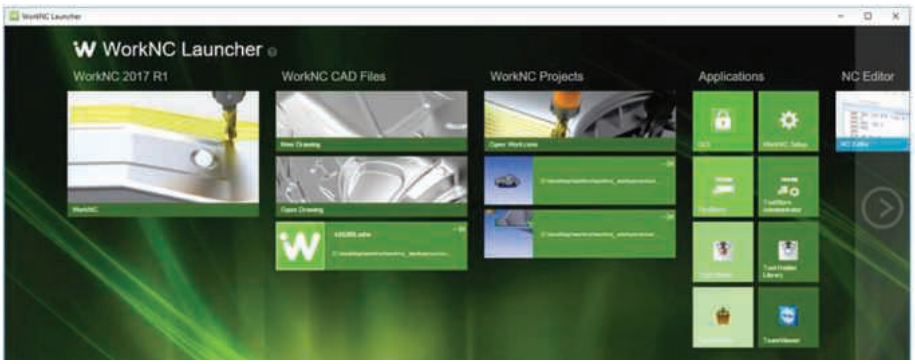
WorkNC 2017 R1 unveils powerful new strategies

Vero Software has just released the 2017 R1 edition of WorkNC, which includes a number of items of powerful new strategies to improve productivity for its CAM users. WorkNC 2017 R1 is the first version under the new six month cycle release plan. Brand manager Miguel Johann says: "This allows us to deliver the latest features to our customers much faster, keeping them on the cutting edge of technology."

A myriad of other innovative features allowing important time savings in terms of programming are available in WorkNC 2017 R1. For example, 3D tool compensation, which is a unique new feature for 3-axis and 3+2 axis machining.

Miguel Johann says: "No more need to program and calculate several different toolpaths to determine the required result. And this applies to whatever controller is fitted to the milling centre."



Time savings for increased productivity

One of the major new items of functionality is the Parallel Finishing toolpath, based on the paradigm-shifting "Advanced Toolform" technology from Vero Software. The new Parallel Finishing toolpath calculation considers the real physical geometry of the cutting tool, whether it is a high-feed cutter, a standard tool or whatever form of convex tool shape.

Miguel Johann says: "We invite customers and prospects to break away from the limitations of standard tool shapes and explore the world of high feed cutter shapes. Touching the part with a bigger radius results in smaller and smoother cusps, which are more widely spaced, allowing the use of larger stepovers and machining times to be reduced by up to 80 percent. Furthermore, thanks to this new technology, positive or negative stock allowances can be defined. This is new."

Among other highly anticipated improvements by established users of WorkNC is the dynamic calculation queueing function which offers important time savings. Operators can now launch the creation of several toolpaths one after the other, run postprocessors, or check for eventual tool holder collisions without having to wait until the end of the calculations in progress.

High performance, top quality machining

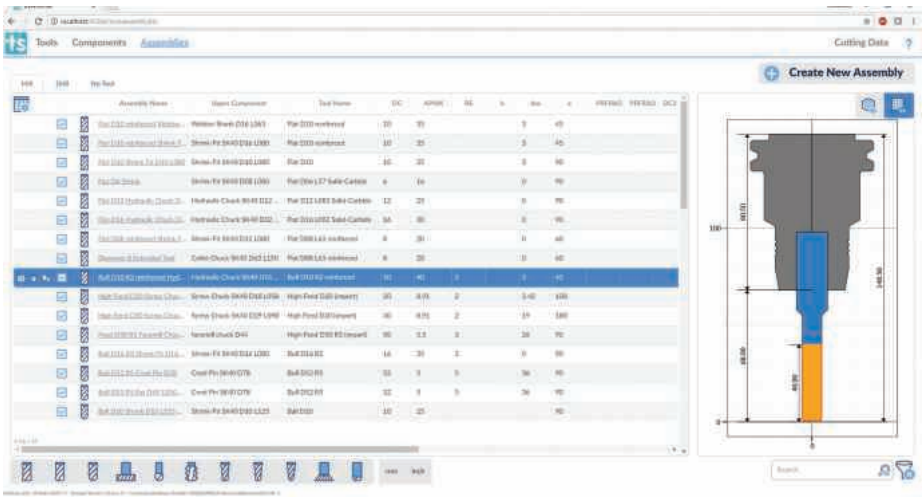
WorkNC 2017 R1 ensures improved quality and machining performance on large parts, with the addition of the new 3-axis special vertical rotation strategy in Auto5, offering a genuine solution for out-of-limit conditions. This takes advantage of the machine's capabilities to trigger automatic table rotation to provide continuous machining, ensuring minimal setup down time and higher surface quality.

5-axis machining welcomes the new manual option to the existing surface, curve and axis modes for creating and editing 5-axis curve sets. Miguel Johann says: "Say goodbye to jerky machine head movements. Users can quickly and progressively adjust tool orientation during the curve creation process while maintaining precise control of machine head rotational movements. Toolpath fluidity and surface finishing are both greatly improved. This option is recommended for engraving and trimming operations."

Flexibility and user autonomy

WorkNC 2017 R1 addresses the need for further autonomy and flexibility of the machine operator in the workshop. The new WorkNC shop floor editor is a genuine analysis tool which allows toolpaths to be displayed, simulated and checked before running the routines on the machine. With this independence, operators will be able to rapidly postprocess toolpaths in the machining context, predefined by the CAM programmer, and then run the toolpaths on the machine itself.

The new WorkNC launcher presents the entire suite of WorkNC tools to the user, as well as a customisable zone for users to drag and drop their favourite applications or folders. And the new ToolStore, shared with other Vero Software CAM solutions, is based on a modern user interface. This

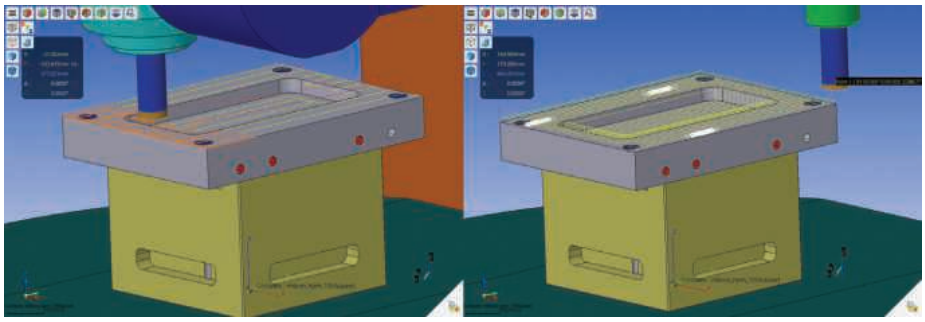


application is compatible with other tool libraries available on the market. Tool duplication is no longer necessary; a single tool can have different cutting conditions according to the material to be machined.

The continuous and regular improvements made to existing toolpaths are reflected in both the Z-Level finishing and Waveform roughing toolpaths.

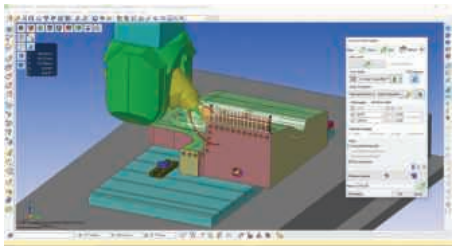
Miguel Johann concludes: "These ensure that WorkNC users fully benefit from new algorithms and machining technologies, offering best-in-class machining efficiency."

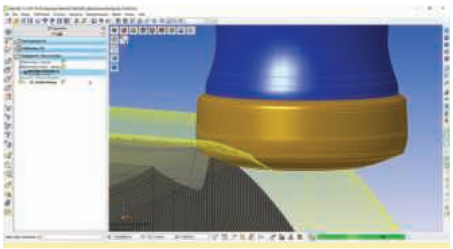
Headquartered in England, Vero Software designs, develops, and supplies CADCAM and CAE software, radically enhancing the efficiency of design and manufacturing processes, providing its customers with exceptional value through high productivity gains and significantly reducing time to market. The company's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



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

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





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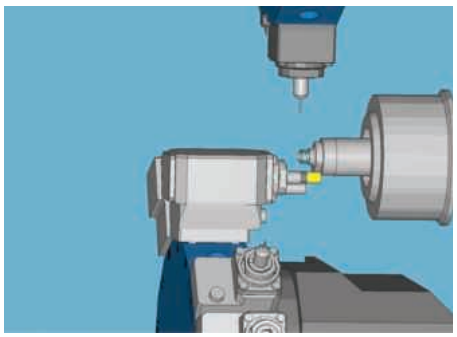
Valley Machine achieves tight tolerances with new CADCAM software

Valley Machine, located in North Plains, Oregon, specialises in providing precision machined components as well as full integration of its customer's entire product life cycle; from precision manufacturing to technical mechanical assembly. The company primarily manufactures components for the semiconductor, medical, photonics, optics, and aerospace industries. Having to support multiple industries, Valley Machine uses a wide range of various CNC mills and lathes, including five Mori NH4000 horizontal mills, some supporting 40 taper vertical mills, two Miyano BNJ42S twin turret, twin spindle machines and an INDEX C200 three turret, twin spindle lathe.

With Valley Machine's busy shop floor environment, the ability to post-process edit-free code is critical to manufacturing the high precision components its customers demand and delivering them on time. Valley Machine made the decision to implement a CAM software system that could immediately run complex mill/turn machines, as well as standard mills and lathes, without having to write and troubleshoot custom post-processors. After evaluating the top CAM companies on the market, Valley Machine chose ESPRIT CADCAM software for its multi-channel synching ability, post processors produce accurate g-code the first time, and world-class customer technical support.

Jeremiah Archer, lead programmer of Valley Machine says: "The support we received prior to even purchasing the product was superior, and immediately providing the help I need is something the ESPRIT support team excels at. There was never a hesitation when I asked to borrow a machine setup or post for evaluation.''



ESPRIT simulation of medical interconnect machining

After purchasing ESPRIT CAM, and attending a short week-long training program, Valley Machine was immediately able to start re-programming existing projects and begin new projects on two Miyano BNJ42S machines. In addition, ESPRIT gave them the opportunity to create more complex parts on their INDEX C200 lathe, improving process planning and in turn decreasing part cycle time and increasing productivity.

Jeremiah Archer says: ''After just a week of basic ESPRIT training I could post edit-free code and quickly program one of the most complex lathes in the industry.''

Machining of medical interconnect on an INDEX C200 lathe

Complex machining made easy

Once Valley Machine was confident ESPRIT CAM could handle its shop's complex programming needs, they began to optimise the machining capabilities of the new INDEX C200 lathe in order to manufacture an important component for one of its medical industry customers. The project involved producing 2,000 medical interconnects made from 303 stainless steel.

In the past, Valley Machine faced many challenges when trying to manufacture these medical interconnects. In addition to problematic hand-written programs, they had to machine the parts on a twin spindle lathe then move the parts to a separate vertical mill to machine the face holes and milled profiles, which cost them valuable production time and money. With ESPRIT CAM software seamlessly running the new complex three turret, twin spindle lathe, programming the part was easy, with precise machine simulation and syncing capabilities that allowed Valley Machine to quickly re-sequence cutting operations. This not only reduced cycle time, but helped hold tight tolerances as well.

Jeremiah Archer says: ''When the customer was switching materials around, we could adjust speeds, feeds and cutter passes accordingly.'' Using ESPRIT, Valley Machine was now able to produce solid, edit-free lathe programs that helped reduce setup times and significantly reduced the cycle time, while also improving part quality.

Valley Machine now enjoys quicker machine setup times in ESPRIT with post processors that consistently generate accurate g-code, saving the company valuable machining time and increasing its productivity. Valley Machine can now efficiently machine any part on its complex mill/turn lathes with ESPRIT CAM.

Jeremiah Archer concludes:" It's super easy to make changes and try new things when you have a part programmed in ESPRIT because of its realistic full machine simulation, which allows you to visualise each operation.''

Valley Machine continues to expand its technology and capabilities and is gaining additional opportunities to machine more complex parts in new markets with the help of ESPRIT CAM.

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Latest release has many new and enhanced features

ModuleWorks, the leading supplier of CAD/CAM components for toolpath generation and simulation, recently announced the latest release of its CAM components, ModuleWorks 2016.12, the third major update of 2016. Each ModuleWorks release contains many new and enhanced features across the product range. This latest version includes new features for 5-axis, 3-axis, turning and simulation.

Highlights of the new release are as follows:

5-axis machining

Swarf machining can now be used as a 4-axis solution. The tool orientation is aligned for a complete 4-axis cycle. This enables 4-axis Swarf tilting to be applied to parts that need to be machined with a 5-axis operation.

The new advanced engagement options for port machining reduce the cutting load at the beginning of the port machining process are: Edge rolling ensures the tool enters the port smoothly and gradually. Approach and retract ramps can be applied to each side of the geometry for gradual and safe approach and retraction of the tool. A maximum overlap can be applied to optimise the distance between two toolpath segments.

The roughing operation for rotary machining has two new methods:
Offset - this method defines parallel steps along the rotational axis on the entire machined surface.
Spiral – the roughing process automatically chooses spiral cuts based on machine conditions to ensure the cuts are performed only in a safe environment without collisions.

3-axis machining

A new undercutting process provides greater access from a single direction to minimise the number of operations in different machining directions.

The shape of the holder and arbor are now also taken into consideration during the toolpath calculation to avoid collisions between the entire tool and machining surfaces. This further improves the quality of the toolpaths and reduces the number of modifications to the cutting program.

A new High Speed Machining Pencil cycle accelerates corner and fillet processing using single or multi pencil cuts.

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Tebis helps patterns company speed ahead of the competition

MHP Industries Ltd introduced Tebis to its production last year and so far has witnessed a 20 percent time reduction in its manufacturing processes. The company produced the helmets for Team GB's cycle team for both the London and Rio Olympics using Tebis in 2016 to help speed up the process and now has plans to expand the use of Tebis throughout the business to achieve similar results

MHP was founded in 1972 and initially produced patterns for the foundry industry. Over 30 years ago, the company developed a broader customer base and moved into plastics. Now the company specialises in vacuum forming and toolmaking. The company has a progressive outlook and recently employed three apprentices, with one apprentice solely working on Tebis.

At its premises in High Wycombe, MHP has capabilities in vacuum forming, tool design and toolmaking, 5- and 3-axis routing, CNC machining, assembly and fabrication, packing and distribution. Tebis was chosen after Steve (head of programming) and Richard (head of design) at MHP decided that the 5-axis functionality within Tebis was greater than any other software competitors on the market.

The 2012 Olympic helmets produced by MHP for the British Racing Cycling Team

The Olympics, MHP and Tebis

The Olympic project began a number of years ago when MHP were commissioned by UK Sport to produce the helmets for the British racing cycling team. Two types of helmet were developed by British Cycling and the team at MHP, one for Pursuit and one for Sprint events and the project involved former cyclist Chris Boardman. According to MHP, the helmets were a real feat of engineering, created in one piece and therefore being as aerodynamic and streamlined as possible. In fact MHP had to design the tooling to manufacture the helmets as per the designs, such was the challenge they faced. The hard work was rewarded though with 12 medals won by riders wearing MHP helmets in 2012 and the helmets were also used for the Paralympics resulting in a further 22 medals.

In preparation for the 2016 Olympics, the helmets were all cut using Tebis software allowing for a quicker workflow and turnaround of the helmets as well as producing a premium trimming finish. Regarding the project Mark Hipgrave, director at MHP says: "We were proud to have been chosen for a second time to be involved in the production of the helmets for the British racing cycling team. The finish for 2016 was even better with the use of Tebis and its high speed trimming capabilities. It appears some of the increased speed rubbed off on our Olympic team in Rio!"

Time to invest

The company is looking to the future with an investment programme and recently purchased a new Haas VF9 CNC Machine. With the continued quest for increased productivity it was also time for MHP to invest in a CAD/CAM software solution that was second to none.

"The software package we were using worked ok, but as the company grew, customer demands became greater and we needed to find something more sophisticated." says Mark Hipgrave. "We decided we wanted the best type of 5-axis software we could find and that's why we chose Tebis."

Mark continues to explain that, with using Tebis software, the company is going through all its previous programmes and re-programming them, which has enabled the business to save time on the trimming. The work it has to do after the trimming process such as finishing has also seen times drastically reduced.

Speeding ahead

Now that MHP is reaping the benefits of introducing Tebis to its trimming processes, it is looking to expand the use of Tebis into its machining operations on the tooling side. Mark Hipgrave explains: "We currently have five CNC machines with capacity of up to 3 m x 1 m x 1 m and we hope to utilise Tebis on the machining side as we do on the 5-axis side and cut machining times down".

MHP produces other items using vacuum forming programmed by Tebis, including hubs for wind turbines and parts for full size motorcycle kits

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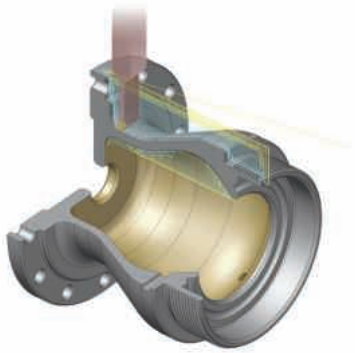
Mastercam 2017 lathe

From accepting and programming any CAD file to dynamic roughing and precision finishing, Mastercam 2017 lathe provides users with a variety of techniques to turn all parts exactly as they need them. Mastercam 2017 lathe features a new chip break option, TNRC control, stock model enhancements, and so much more.

Align Solid Body
The Align Solid Body function simplifies the process of aligning solid models for turning. Users can define the centre of the rotation for the part and select the appropriate geometry. Mastercam will then rotate to an isometric view where the dynamic gnomon can be used to adjust the origin.



Chip break
A new option and dialog box has been added to the Lathe Rough and Lathe Contour Rough toolpaths to establish when chip breaks occur. This is valuable when working with stringy materials such as aluminum or plastic, and enables length and time conditions to be sent, retract, and dwell options.

TNRC control for B-axis turning operations
The Tool Angle dialog box contains new options which were previously only available for Mill-Turn operations. These options tell Mastercam which quadrant was used to touch off the tool. If users are creating a toolpath and the tool's control point is not where it is wanted, the options allow for this to be swapped.

The Mastercam 2017 lathe provides a host of features. It has a simplified process for selecting the tool plane, origin, and display mode in the Lathe operations. The new axis combination and spindle origin dialog box filters available tool planes, displaying only those planes with the correct orientation for the selected axis combination. Lathe Stock Model operations now allow users to manipulate the lathe stock boundary using mill operations.

For more information on Mastercam Lathe, please visit **www.mastercamlathe.com**

UK agent, 4D Engineering Ltd is dedicated to providing state-of-the-art software tools for CADCAM manufacturing markets. The company has been the UK and Ireland Mastercam distributor since 1990, and provides sales, training and bespoke manufacturing solutions based around the Mastercam range of products.

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New high performance laser tracker

FARO®, the trusted source for 3D measurement and imaging solutions for factory metrology, product design, construction BIM/CIM, public safety forensics and 3D solutions and services applications, has announced the launch of a new addition to its Vantage Laser Tracker product line. The new Vantage^{E} includes well-proven features and capabilities such as high-speed dynamic measurement, and is affordably priced for customers who demand high performance while working with short-to-medium range applications.

The FARO Vantage^{E} Laser Tracker is ideally suited for customers who do not require the extended measurement range that is provided by the premium Vantage solution but still demand the trusted and robust features the Vantage platform provides. This release provides customers with increased flexibility in terms of capability and pricing, dependent on their application-specific demands.

The new Vantage^{E} Laser Tracker has a range of up to 25 m through FARO's patented, fifth-generation TruADM (Absolute Distance Metre) technology, which enables fully-dynamic measurement capabilities. Vantage trackers are able to continuously scan and take measurements while a spherical optical probe is tracked across the surface of the part, object or assembly. If the laser beam is interrupted at any time while the probe is being moved, the user can simply and instantly reacquire the beam and continue measuring.

The Vantage^{E} provides full support for FARO's patented Super 6DoF (Degrees of Freedom) TrackArm solution, which enables a Vantage tracker and one or more FARO ScanArms to work together to create an integrated 3D measurement system. Super 6DoF completely eliminates line-of sight challenges and significantly expands measurement range while maintaining superior accuracy.

FARO chief commercial officer, Joe Arezone says: "A number of our factory metrology customers have expressed the need for a more affordable, but feature-rich tracker that would meet their applications for short-to-mid distance measurement. In developing the Vantage^{E}, we quickly realised that customers would still need the accuracy of our longer-distance tracker along with the robust features that make the FARO Vantage Tracker solution ideally suited for solving real-world, everyday measurement challenges. Additionally, the Vantage^{E} is value-priced at approximately 30 percent less than the premium Vantage while offering many of the same features and similar accuracy."

The FARO Vantage Laser Tracker offers a cost-effective solution for applications such as quality inspection, tool-building, alignment, and reverse engineering. In contrast to using traditional measurement solutions, operators are able to complete complex 3D measurement jobs much faster, reduce downtime and scrap, and most importantly, get accurate, consistent and reportable measurement data.

The new FARO Vantage Laser Tracker platform is the first that utilises FARO RemoteControls™ (patent pending) for advanced control of the system using a mobile phone or tablet device. The mobile device not only controls the movements of the laser tracker but also delivers enhanced functionality such as live video feed from targeting cameras so that a single operator can now easily control the laser tracker from anywhere in the measurement area. Also included are innovative workflow management features such as remote accuracy checks and programmable remote warm-up so the user can schedule the device to turn on in advance and make it ready for immediate operation when the operator arrives.

FARO RemoteControls also includes next generation functionality where the laser beam can be automatically re-established with a simple set of gestures, indoors or outdoors. This dramatically improves efficiency and productivity by eliminating the challenge of a broken laser beam and the need to manually reacquire the target. Finally, FARO RemoteControls significantly reduces user training by dramatically increasing the ease of use for the operator.

Both FARO Vantage^{S} and FARO Vantage^{E} fully support FARO's patented Super 6DoF (Degrees of Freedom) TrackArm solution, which enables a Vantage Tracker and a FARO ScanArm®, or multiple ScanArms, to work together to create an integrated 3D measurement solution across a single coordinate system. Super 6DoF completely eliminates line-of sight challenges and significantly expands measurement range while maintaining superior accuracy with two instruments-in-one operation.

To learn more about the new Vantage^{E} and FARO's additional laser tracker solutions, visit **www.faro.com/en-us/products/metrology/faro-laser-tracker/overview**

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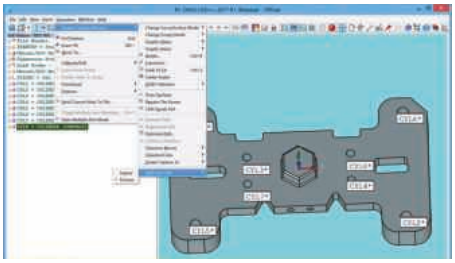
Hexagon releases PC-DMIS 2017 R1

Hexagon Manufacturing Intelligence has launched PC-DMIS 2017 R1, the latest edition of its popular measurement software. 'R1' is short for 'Release 1' as there are two major releases scheduled for PC-DMIS in 2017, with continued service pack updates to ensure maximum reliability of the platform.

PC-DMIS 2017 R1 makes it easier to find and learn about the new features and enhancements of the software by adding a 'what's new' pop-up animation when first starting the application. The release notes have also been organised for easy access to the most important information. Application performance has been optimised for speeding up everyday tasks like opening and executing measurement routines, copy and paste, and file importing.

This release of PC-DMIS is also previewing a new path optimisation tool that takes advantage of multithreading on multi-core PCs, making path optimisation faster than ever. QuickMeasure tools are extended to basic scanning operations and a new measurement strategy for AutoFeature Plane allows discrete point selection.



QuickFeature selection is also now available in the live view on optical CMMs. Enhanced point cloud tools include: a new Caliper tool for two-point checks that works like physical caliper, and improved zoom and rotation for portable scanners where scan data now flows more smoothly into the graphic window. A new size dimension option allows local and global sizes for ASME and ISO standards and a new feature-sensor mapping tool brings enhanced QuickFeature control for multisensor measurement routines.

Ken Woodbine, product line manager of the Hexagon Manufacturing Intelligence Metrology Software division says: "PC-DMIS 2017 R1 continues the measureable trends towards great product stability and improved user experience. This release marks another significant step forward, with even more valuable enhancements that contribute to overall workflow improvements across all areas of the product."

PC-DMIS 2017 R1 also debuts two new accessory applications designed for the shop-floor environment, inspect and notification centre. Inspect is a simple-to-configure platform to run PC-DMIS measurement routines and view reports, while notification centre helps the user keep an eye on multiple inspection processes with configurable warnings from embedded or external CMM lights as well as multiple sound events.

PC-DMIS 2017 R1 is available to download immediately. More information is available through local Hexagon commercial operations and dealers.

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Koenigsegg hits top speed with Creaform

Swedish supercar manufacturer Koenigsegg Automotive AB is a brand defined by painstaking precision and hand-crafting that results in an end product that most can only ever dream of owning. The entire business is built around enhancing vehicle performance and streamlining productivity, something that has undoubtedly been achieved considering the cars have a 0-100 mph time.

The small Scandinavian manufacturer has become world renowned, a multiple world record holder and above all, an engineering innovator. This has been true of the company ever since owner and founder Christian Koenigsegg set about following his dream to develop a super car at the age of 22, back in 1994. The odds were stacked against him. His idea was to create a sports car that he felt did not currently exist and one which he believed would be desired, two essential ingredients for success.

The concept was a lightweight mid-engine car with a detachable, storable hardtop. The car would look and feel good with the top up or as a roadster, transformed in minutes with the hard top neatly tucked away inside the car. Christian Koenigsegg envisioned a car with a timeless appearance that aged like good wine. This was a mid-engine car concept that did not exist at the time. Every Koenigsegg created since then now includes this simple, but effective, DNA attuned to Christian Koenigsegg's original vision. Five production models later, the company has exploded on to the international scene and is here to stay. With a small workforce of just 70 staff, the Ängelholm company increasingly targets methods to streamline the production process. Already integrating 3D printing and 3D scanning in the development of its vehicles, Koenigsegg decided to tackle quality control in the engineering and production of its cars. Like many before them, the company used a portable measuring arm to perform measurement of parts, together with the setup of fixtures and reverse engineering of components. Due to the frequent functional downsides of such measuring systems, the company turned to the expertise and proven track record of Creaform's quality control solutions to streamline its design process right down to the final assembly of the car. With the help of Creaform's Swedish distributor, MLT Maskin & Laser Teknik AB, the automotive manufacturer found a solution that seamlessly fitted into the way it wanted to work.

Recalling the introduction of Creaform metrology equipment, Koenigsegg's technical director, Jon Gunner says: "We've tried to push the boundaries whilst focusing upon production engineering. Having ultra-low volume of a production vehicle is a big challenge. We used metrology to quickly identify problems and solve them in the best manner. We wanted something that would be more flexible and fit in with the way we work, rather than the other way around. Creaform fitted the bill perfectly for that."

With over 300 hand-formed carbon fibre parts in every car, it was mandatory that the quality control equipment was able to effectively scan on dark and highly reflective surfaces. These surfaces are the most challenging surfaces to scan as light is absorbed by dark objects and shiny surfaces create noise during analysis. To satisfy such demanding applications, Creaform has developed portable scanning solutions that are specifically engineered to overcome these issues. Moreover, Creaform has optimised its 3D scanner performance levels on shiny surfaces in its latest MetraSCAN3D scanners. The scanners, offered by Measurement Solutions in the UK, can achieve more accurate results at 12 times the speed with its seven laser crosses. The new HandyPROBE portable CMM can also achieve instant measurements at twice the accuracy than before. The two inspection

solutions also come in a new sleek and sturdier carbon fibre composite design that has been optimised for shop-floor hardware reliability.

Louis-Olivier, an application engineer from Creaform's metrology services division, helped the Koenigsegg team to conduct a full-body scan of its newest model, the Regera. Just like the Measurement Solutions team, when Creaform's metrology service team are called on a job, the engineers bring in the equipment required for the most demanding of projects. With Koenigsegg, the team wrapped up the full-body scan with a photogrammetry session using the MAXshot3D optical CMM. This crucial step enabled the team to get the maximum accuracy in the alignment of the scans that are required in quality control applications.

Meeting technical experts from Creaform was also a great opportunity for Koenigsegg engineers to get some tips and tricks on solutions and discuss other applications that would benefit from the enhanced production efficiency and quality control processes that are delivered by Creaform. The MetraSCAN3D and HandySCAN3D scanners proved the perfect fit in terms of system performance and data acquisition accuracy on dark surfaces and bare carbon fibre car bodies. Paired with the HandyPROBE portable CMM for single point measurements, Koenigsegg engineers could rapidly adjust jigs and inspect production parts to get extremely quick feedback on the quality of the company's production line.

Jon Gunner says: "Perfection is a moving target, it's difficult to stay on top and stay ahead of the competition and when we chose partners like Creaform, we're looking for the same aspirations from that company. We definitely feel that Creaform are leading the way in metrology, like we are leading the way in automotive."

As a world-class manufacturer of high-performance sports cars, Christian Koenigsegg and his team push the limits of technology and innovation to develop the best hyper cars on the market. Their passion-infused engineering excellence, backed by Christian's vision, is what fuels the company's forward-thinking mindset and makes Koenigsegg a true leader in the automotive industry. His relentless drive and sound ingenuity echo Creaform's core values of innovation, passion and determination. As of now, Christian and his team are working on integrating the HandySCAN3D in the design process and furthering the capabilities of Creaform's probing and scanning systems in its production process.

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Laser scanner paid for itself within a year

Quality Needles, one of the world's leading medical needle producers and exporters specialising in the manufacture of surgical suture needles, is using a fast, high accuracy Nikon Metrology LC15Dx CMM laser scanner for inspecting its in-house produced tools.

Incorporated in 1984, the company is based in Noida, India and produces over 2,500 different types and sizes of regular eye, spring eye, drilled end and atraumatic needles in large quantities. The company currently exports 80 percent of its output to Europe, Asia, the Americas and Africa for use in a wide range of procedures from ophthalmic to cardiovascular.

Strict quality assurance procedures are adhered to, as the needles must conform to worldwide standards such as IS-9165: Bureau of Indian Standards and the German Vornorm DIN-13170. To meet these standards, Quality Needles tests its products for sharpness, stiffness, ductility and other characteristics.

The tools that produce the needles are also monitored closely and the manufacturer's success is largely attributed to economical in-house development of its own production equipment, tools and technology. External suppliers were either unable to guarantee the levels of quality required, or the parts would have had to be imported and were simply too costly.

The feed wheel, for example, is a particularly critical part in the manufacturing process, as it is used to transport needles from station to station. The EN 31 carbon alloy steel component features grooves that vary in size, typically between 0.2 mm and 0.9 mm, for carrying the needles. Accuracy and concentricity are very important for its functionality.

Quality Needles needed a metrology solution that was accurate and reliable enough to check the profile, straightness, dimensions and concentricity of components in a pressurised, high productivity environment. A feed wheel was used as a test piece to determine if the various laser scanners benchmarked were capable of measuring surfaces and features.

With Enhanced Sensor Performance (ESP3) technology and a probing error of just 1.9 µm, comparable to tactile probing

accuracy, the LC15Dx offers the best accuracy for a laser scanner. ESP3 maintains accuracy, speed and data quality by intelligently adapting the laser settings for each measured point in real-time, which is necessary to cope with the shiny surfaces and varying reflections. Point clouds generated during inspection routines are compared to original CAD models, with coloured deviation plots indicating where errors have occurred.

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www.nikonmetrology.com

Mitutoyo provides Brandauer with a vision of quality

Birmingham-based C Brandauer & Co Ltd was founded more than 154-years ago and is now regarded as one of the largest independent contract presswork and stamping concerns in Europe. The company, which employs 56 people, specialises in manufacturing high-speed, precision stamped components for clients involved in a wide range of industries, including automotive, domestic goods, electronics and renewables.

C Brandauer provides an all-embracing range of pressed metal components services to its global customer base, ranging from prototyping, design and in-house tool production, through to tool transfer and low volume special product manufacture.

In order to meet the rigorous demands of modern manufacturing, C Brandauer is firmly committed to continuous investment in its state-of-the-art facility, as demonstrated by the £750,000 investment in two state-of-the-art Bruderer presses and the implementation of a £400,000 Microsoft Navision MRP system. The advanced, highly productive presses and other production related purchases help satisfy growing demand and allow the production of millions of parts every month.

With the aim of accommodating the company's increased production levels, a recent investment was made in an advanced 3D, CNC vision measuring system from Mitutoyo UK.

Robert Freeman, quality assurance manager at C Brandauer, explains: "Our investments extend well beyond the acquisition of cutting-edge production technology; we put just as much resource and attention into the on-going development of our quality management systems.

"For example, we hold all of the major quality and environmental accreditations appropriate to our key markets and our operations are managed and benchmarked through real time data collection and strictly monitored performance indicators. This allows us to successfully export more than 75 percent of our products to customers in China, the EU and the United States.

"Our inspection requirement is for equipment that is highly automated, fast, accurate and repeatable. Our first purchase of a Mitutoyo CNC vision measuring system, made 17 years ago, satisfied all of these criteria. As the system proved to be a great success, two further Mitutoyo Systems were soon added. The excellent performance and reliability of the three machines, combined with the outstanding customer service we have enjoyed, has ensured that we now have a long-standing relationship with Mitutoyo UK.

"An increase in customer volumes and new business wins have necessitated the need for further investments, we also wanted to ensure we were at the forefront of advancements in the 'measuring' field. This led to us benchmarking the latest Mitutoyo against alternative systems from other manufacturers. Following an in-depth demonstration of the Quick Vision Elf Pro, performed on a cross section of our parts, we agreed that the Mitutoyo machine was ideal for our current and future needs."

C Brandauer's quality personnel are now able to load multiple parts on to the Quick Vision Elf Pro's component support, recall the appropriate programme, then instigate a rapid, fully automatic CNC measuring routine.

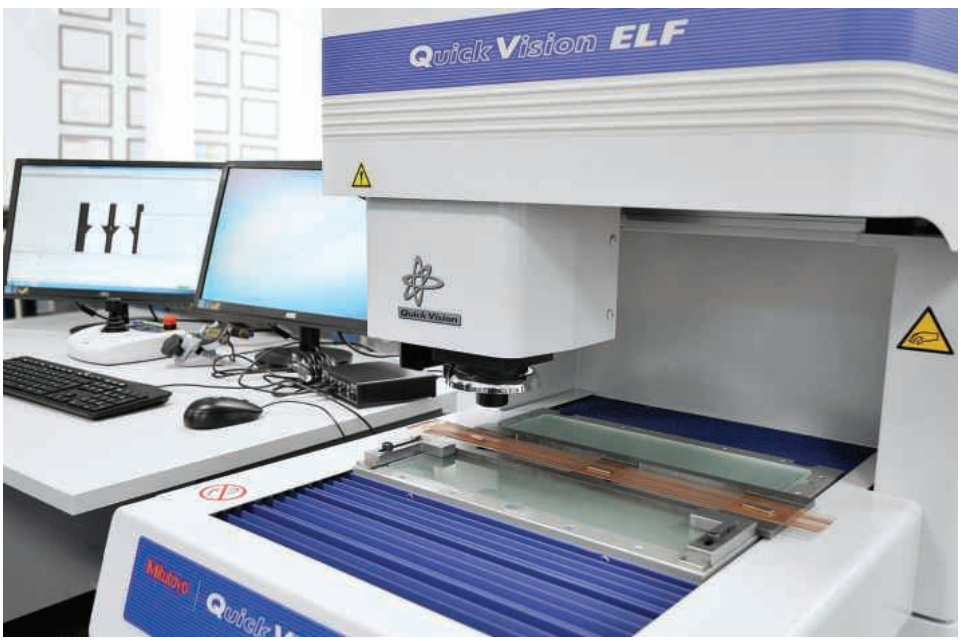
In addition to accuracy and repeatability, the vision measuring system's impressive speed means that the company has significantly reduced previous inspection times.

Robert Freeman continues: "Many of the components we manufacture have challenging accuracy specifications and are designed to be used in demanding and high-pressured environments. The precision and speed of Vision Elf Pro means that we are able to give prompt feedback to production regarding component features that are beginning to deviate from their nominal conditions and ensure there are no reject parts going to the customer. The early intervention has further reduced our already low scrap levels and helps to guarantee the continued delivery of quality components."

The Mitutoyo Quick Vision Elf Pro is an advanced 3D CNC vision measuring system with a resolution of 0.1 µm. It provides accuracy in the 2.3µm class, when measuring up to 100 mm. The machine has a measuring range of X 250 mm, Y 200 mm and Z 200 mm and is able to accommodate multiple smaller components or a single larger part.

The popular Quick Vision Elf Pro is regarded as a highly efficient, time saving 3D CNC vision measuring system due to its impressive X/Y/Z axes drive speed of 200 mm/s. Programmable ring lighting provides flexibility in lighting direction, angle and intensity, regardless of the inclination of the workpiece surface. This advanced feature enables maximum surface contrast to be achieved and best imaging resolution and accuracy to be realised.

Fine control of obliquity and direction provides optimal illumination for measurement. Obliquity can be arbitrarily



set in the range from 30° to 80°. This type of illumination is most effective for enhancing the edges of inclined surfaces or very small steps. Illumination can be controlled independently in every direction.

The Mitutoyo Quick Vision Elf Pro's programmable Power Turret (PPT) offers a three-tube lens selection to provide three magnifications with the same objective lens. Replacement of objective lenses allows a wide magnification range to support a wide variety of measurements.

Mitutoyo is a leading manufacturer of precision measuring equipment, offering a huge range of products from micrometres, calipers and dial gauges to hardness testers, vision measuring systems and 3D coordinate measuring machines from sales offices in more than 40 countries, supported by aftersales representation in more than 100.

In the UK, in addition to providing top-quality products for manufacturing industry, Mitutoyo offers machine-specific training for customers as well as general metrology training courses for companies wishing to upgrade staff skill levels. Support services include technical advice on specific applications of the company's products, UKAS-certified calibration, subcontract measurement, and bespoke system design for particularly challenging measurement and component handling applications.

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User-programmable 2D Vision with SICK's InspectorP

SICK has added to its Inspector 2D vision family with the InspectorP, its first fully user-programmable range of 2D cameras with the performance and flexibility needed for critical vision duties in verification, inspection and quality control.

With the Inspector P63x/64x/65x family of 2D vision cameras, SICK has achieved versatile, high-resolution image processing capability with on-board programming to meet a wide variety of applications such as robot picking and part positioning, quality inspection, error proofing, sorting and precision measurement.

The Inspector P's high-performance optics and illumination, together with a resolution range of between 1-4 megapixels, deliver a choice of options for even complex, long-range or high-speed vision tasks. Users have the freedom and flexibility to develop their application software on the InspectorP using the SICK AppSpace programming platform and a flexible user interface. On-board image processing and object evaluation is provided via the pre-installed HALCON image library.

Neil Sandhu, SICK's UK product manager for imaging, measurement, ranging & systems says: "With the new InspectorP, whether you are an OEM user or a system integrator you have all the application-programmability you need and you can develop your application software to suit.

"The three programmable Inspector models are similar in size to standard embedded configurable smart cameras and offer the same advanced performance at a cost competitive with PC-based vision 2D cameras."

The SICK Inspector P63x, 64x and 65x models offer a choice of evaluation speeds and camera resolutions, with convenient functions such as aiming lasers, optical and acoustic feedback, and a micro-SD card to retain configuration and operation parameters. All housings are IP65/67 protected against factory conditions for a long, reliable life. Flexible mounting, cabling, connection and other accessory options enable simple installation in any location. The advanced communications capability of the Inspector P63x/64x/65x

series, based on the common SICK 4DPro platform, ensures connectivity with most factory protocols and the devices are visible over the control network to facilitate diagnostics and management overviews.

The compact Inspector P63x offers resolutions from 1 to 2 megapixels and features versatile wide- to long-range optics with C- and S-mount lenses. Illumination in a range of colours allows simple integration with virtually any process set up and any distance.

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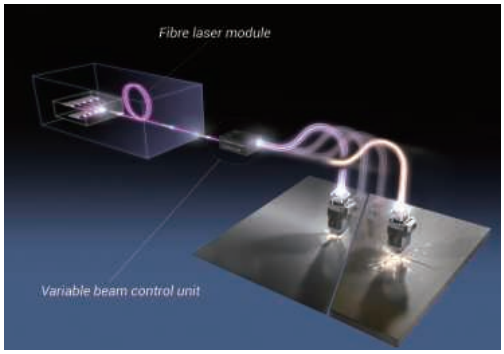
Fibre laser cutting with expanded capabilities

AMADA launches a new 3kW version of its ENSIS-AJ fibre laser machine and expands fibre laser machine line-up with its LCG-AJ

Leading manufacturer AMADA offers a wide range of laser cutting machines to fully satisfy and meet the high demands of its customers. To improve and enhance the groundbreaking ENSIS technology, AMADA will add a 3 kW version to the ENSIS range in 2017. This machine will build on the success of the 2 kW version with improved cutting speeds and quality. In line with the existing high specification level of the 2 kW ENSIS, the new machine will also be fitted with an automatic nozzle changer and AMADA's original WACS (Water Assisted Cutting System) for stable thick mild steel processing.

"Less is more" is the design principle of the ENSIS-AJ fibre laser cutting machine. This means that, although many laser manufacturers simply provide higher power fibre lasers, AMADA has looked at ways to increase cutting capabilities but keep the overall power consumption very low. The ENSIS 2 kW is capable of cutting over 20mm thick mild steel. Usually, this would require 6 kW of laser power from a standard type fibre laser. This 50 percent reduction in power provided by the ENSIS lasers gives lower cost-per-part results for the customer. On top of this, the ENSIS series of laser cutting machines has several other benefits.

AMADA's unique beam control technology, which automatically adapts the laser to the material thickness, eases the processing. With a positioning speed of 170 m/min, the fastest in class, it is also a low energy consumer thanks to the efficiency of AMADA's fibre laser technology. Using individual high power diode modules allows for an exceptionally high beam quality, giving the end user higher cutting speeds compared to systems with a lower beam quality. It also benefits from full range cutting capabilities without changing the lens and full access to the front and side of the cutting area, allowing quick and easy operation. AMADA's latest AMNC 3i control ensures simple operation with its smart-phone type 21.5" screen, including on-screen nesting, program scheduling and one-touch setup features. All ENSIS machines are compatible with AMADA's Digital Support System (ADSS) which allows customers to analyse and compare machine performance, as well as allowing AMADA to provide proactive service support.



LCG-AJ - expanding the fibre laser machine line-up

AMADA's latest line-up of LCG-AJ flatbed laser cutting machines are equipped with AMADA developed 2, 3,4, 6 and 9 kW fibre laser oscillators. AMADA were the first laser machine manufacturer to develop its own fibre laser source. Manufacturing and testing takes place at AMADA's Fujinomiya factory and incorporates all of AMADA's extensive knowledge gained over more than 35 years of laser machine production. Offering high cutting speed, low running costs and the ability to cut copper, brass and titanium, the LCG-AJ sets a new benchmark for performance and price at this level of investment, ensuring optimum productivity and value.

New machines have been added to the LCG-AJ line-up in order to make it a comprehensive range now including 2, 3, 4, 6, 9 kW powers. The LCG-AJ range has a lightweight Y-axis carriage with low centre of gravity providing a 30 percent weight reduction. Most LCG-AJ fibre lasers incorporate an automatic nozzle changer for uninterrupted processing and all are compatible with AMADA's Digital Support System (ADSS) which allows customers to analyse and compare machine performance, as well as allowing AMADA to provide proactive service support.

With a positioning speed of 170 m/min, the fastest in class, they are also low energy consumers thanks to the efficiency of AMADA's fibre laser technology. Using individual high power diode modules allows for an exceptionally high beam quality, giving the end user higher cutting speeds compared to systems with a lower beam quality.

AMADA's latest AMNC 3i control ensures simple operation with its smart-phone type 21.5" screen, including on-screen nesting, program scheduling and one-touch setup features.

The LCG-3015AJ machines are fully compatible with AMADA's latest, high speed part picking system, the TK L. This gives high speed removal and stacking of finished components, increasing productivity and minimizing downtime between the cutting process and the next step of manufacture. All LCG-AJ machines can be equipped with load\unload systems for full productivity.

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Full-service fabricator progresses from CO_2 to fibre laser cutting

With more than three decades of experience in cutting, forming, welding and assembly of sheet metal components, supported by a modern enterprise resource planning system, Stoke-on-Trent subcontractor Grenville Engineering installed its first fibre laser cutting centre in November 2016, a 3 kW BySprint Fiber 3015 from Bystronic UK.

The 3 m x 1.5 m sheet capacity machine replaced an old CO_2 laser facility from another supplier, leaving two 3.2 kW CO_2 machines on site capable of cutting up to 20 mm thick mild steel. On thin materials, the fibre laser machine cuts two to three times faster and so is much more productive. It has the added advantage of superior performance when processing reflective materials.

Grenville can cut aluminium sheet to a maximum of 8 mm on its CO_2 machines, but 50 percent thicker using fibre technology of similar power. Additionally, the latter can cut copper and its alloys, such as brass and bronze, whereas a CO_2 machine is unable to tackle these materials due to back reflections damaging the optics. Grenville was therefore either turning this work away or putting it on less efficient turret punch presses.

Operations director of the Stoke-on-Trent fabricator, Dali Dong comments: "In manufacturing, you have to keep moving with the times and in terms of laser cutting, that means changing over to fibre.

"We will eventually replace our two remaining CO^2 machines with fibre equivalents of higher power, to enable us to cut thicker materials efficiently and accurately.

Laser-cut components destined for the yellow goods industry

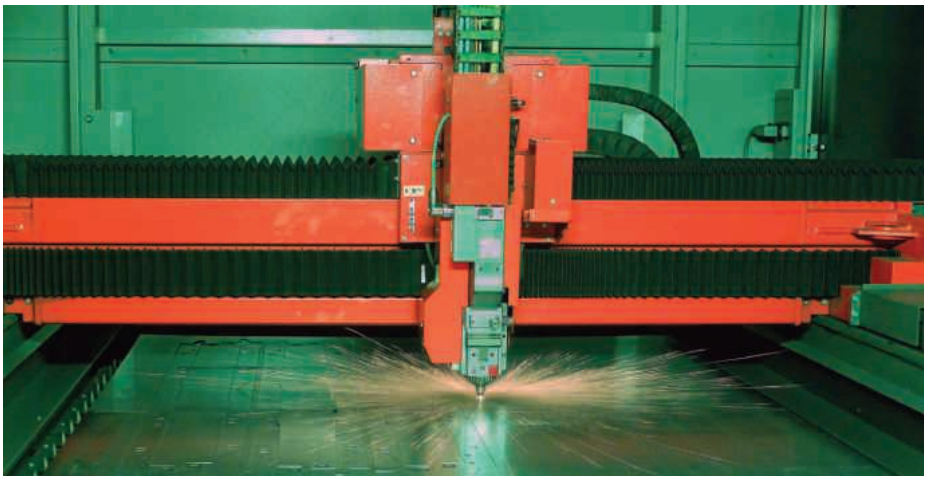
A sheet ready to be loaded onto the shuttle table of the 3 kW BySprint Fiber 3015 at Grenville Engineering

"The big advantage with fibre laser cutting, apart from the speed when processing thinner materials, is its lower running costs. Electricity consumption is significantly less and no expensive laser assist gases are needed."

Before making its latest investment, the management team at Grenville, which includes purchasing director Grant Barratt and sales director Stuart Rawlinson, along with the joint managing directors Mark Barratt and Tony Fryer, undertook an exhaustive appraisal of fibre laser machines on the market. Two were shortlisted, from the incumbent supplier and from Bystronic, with the latter selected as it offered the best all-round package.

Grant Barrett also cited the supplier's good service record, as Grenville has used Bystronic press brakes for many years and the after-sales back-up has been exemplary. There are currently six press brakes on site, including a Bystronic Xpert 150 tonne/3 m model and an Xpert 40 tonne machine installed in December 2016. The latter is the smallest press brake in the Swiss manufacturer's company's range and the fastest for processing work up to one metre long.

After the CO_2 machine had been taken out and the fibre laser cutting machine installed, it quickly cleared the small backlog of work that had built up. Stainless steel shims for the yellow goods sector were cut from 0.5 mm sheet at many times the speed previously possible, while at the other end of the thickness spectrum, 15 mm mild steel was cut efficiently.



Fibre laser cutting in progress

Summing up the fabricator's business plan and the role fibre laser cutting will play, Stuart Rawlinson says: "The aim is to increase our current £4 million turnover by 50 percent over the next three years.

"We will continue offering a complete design and fabrication solution to a broad industry base, the rail sector being a particular target. We regard a shift from CO_2 to fibre laser cutting as central to achieving this goal, both for producing larger runs up to 5,000 but also our more typical batch sizes of 20 to 50-off."

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Wemo presents a new intelligent design concept

WEMO production lines stand for high quality, optimum ease of use and high and efficient production. The Dutch manufacturer recently added an extra dimension to its machine portfolio. Its production lines are now fitted with a fantastic design concept, a modern, colourful and extremely strong housing for correct protection, security and presentation.

WEMO is taking a step forward and is going to great lengths in this respect. With this unique machine design, it is looking towards the future; a future with collaboration between humans and machines as the central theme. The ambition is to move to the very highest level of production and efficiency, expressed in recognisability, quality, style and appearance.

At WEMO, safety always comes first. In the development of its production lines, this is given attention at the most diverse levels. In combination with high production and flexibility, the machines offer pure quality. With the introduction of the new design, a safety fence is for instance superfluous.

Maintenance, service and operation are crucial for optimum production. There are however external factors that can influence the production process, such as dust or dirt, for example. The new design concept optimally protects the production line against all outside influences. This will significantly reduce failures, stoppages or damage.

Seeing is believing. This also applies to the production process. A visual assessment or analysis is and remains essential at all times. By the intelligent construction of the new housings, the user is guaranteed a perfect view of the production process. Due to the modular construction, all parts of the machine can be quickly and easily assessed individually. Everything is easily accessible.

With regards to maintenance, service and tool changing, WEMO makes it easier than ever. Intelligent construction enables the necessary activities to the machines to be done safely. What is more, the individually accessible parts make working safer and easier.

The new digital operator - WEMO operator system of the future

WEMO believes in the further cooperation of humans and machines. This results in achieving the very highest level of production and efficiency. With the arrival of the industrial 'Internet of Things' it will add intelligence to its tools, machines and their operators. This will be achieved via the Microsoft HoloLens. This will connect all available and useful data directly to the machines and the users. Tomorrow's digital workplace is being generated today at WEMO.

WEMO's digital workplace makes use of Mixed Reality. Relevant holograms are projected into the real world via the intelligent headset. Via a simple application, the operator gets immediate access to data that provides a significant efficiency boost in the field of analysis, processes and maintenance.

With the intelligent headset, an operator can control the machines from anywhere. This also applies to the visual analyses or direct consultation of information, such as realised and residual production times or the machine's status. Cameras placed inside the machine make it possible to view the production line process live and at a distance.

Via the user-friendly application, the operator has immediate access to instructions, such as the maintenance protocol, lubrication diagrams and instruction manuals for tool changing etc. All tasks are better arranged and more reliable. In short, the operator can carry out several tasks without support from others, such as his own technical department or WEMO's service department.

Remote help

Sometimes help is essential and stoppage is not an option. Thanks to the accurate cameras in the HoloLens (headset), employees can look along with the operator. This enables solutions and advice to be offered very fast and in real time. You can look over the shoulder and through the eyes of the operator. This is a unique working method and is smart, effective and really fast.

Prevention is better than cure; via the holographic visualisation, an application immediately shows where any incidents in the machine occur. Of course, this is followed up by the correct instructions to solve such incidents. The application also provides an insight into the right life cycle for machine parts and components. In short, the application contributes proactively in the optimisation of your production process.

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Goodman Metal Works declares its 'Genius'

Goodman Metal Works recently took delivery of the UK's first Prima Power, 4 m x 2m capacity Laser Genius. The advanced 6 kW, fibre laser cutting machine boasts a rapid cutting speed and is capable of cutting 25 mm thick mild steel and 20 mm thick stainless steel.

Established in 1964, Goodman Metal Works supplies mild steel, stainless steel and other material fabrication services to companies throughout the UK and Europe and specialises in large metalwork fabrications of up to 25 tonnes. The family run business' comprehensive range of manufacturing resources, including cutting, fabrication, machining, grinding, stress relieving, shot blasting, welding and painting, are housed in an impressive 45,000 sq ft production facility located on the outskirts of Nottingham.

The nature of Goodman Metal Works manufactured products are as diverse as the market sectors the company serves. In addition to other industries, Goodman Metal Works undertakes work for the construction, recycling, automotive, offshore, mining and quarrying sectors. It also manufactures a range of components for power generation and for renewables applications.

"Our service is based on experience, knowledge and reliability," explains managing director, Richard Goodman. "From one-offs to large batch productions, we have the know-how and the systems in place to cope with all types of orders. To ensure that our customers continue to receive a quality service we employ highly skilled staff and invest in the best possible production aids.

"Our recent purchase of a Laser Genius, fibre laser cutting machine from Prima Power UK typifies our procurement philosophy. In addition to the remarkable speed of the new machine and the high quality of its output, we bought the Laser Genius because of its excellent flexibility.

"Due to the diverse nature of our customer base, we need our manufacturing plant to be as adaptable as possible. For example, we produce and supply fully assembled products for the subsea market, such as cable laying and safe storage solutions. In contrast, we also work with architectural designers to create stunning centre pieces and landmark structures for towns and cities.

"With a tolerance accuracy of 0.03 mm, our innovative new Laser Genius machine provides the flexibility we need, it is capable of accommodating large plates of up to 4 m x 2 m and multiple workloads for a wide range of materials, including mild steel of up to 25 mm, stainless steel of up to 20 mm and aluminium up to 12 mm.

"While the quality of our output and the speed and flexibility of our production systems assists our customers, it is critical that we are able to quote competitive prices. Compared to modern systems, our previously used laser cutting machine was proving uneconomical in terms of its consumption of electric and gas, in addition the machine's maintenance costs were continually rising. Now, the use of our recently installed Prima Power machine has considerably improved our efficiencies in all of these areas. The Laser Genius has the advantage of very low power consumption, minimum maintenance needs and low consumable costs. In addition to helping us to quote competitive prices, these qualities are also ecologically beneficial.

"Although, when compared to the alternatives, the Laser Genius proved to be the most suitable laser cutting machine for our needs, our decision to purchase was also based on Prima Power's reputation for reliability and customer service. Following a trouble free machine installation and operator training, Prima Power's engineers have made regular visits to help ensure that we are able to maximise the machine's potential. As the Laser Genius' controls and software are so intuitive and easy to use, our staff have benefited from a very short

learning curve. Now in full production, the machine is proving highly accurate and extremely productive."

Nottinghamshire County Council supported Goodman Metal Works purchase of the new Prima Powers machine through a £178,000 grant from its Economic Development capital Fund.

Prima Power's LASER product range includes machines and systems for 2D and 3D cutting, welding and drilling. The advanced Laser Genius machine purchased by Goodman Metal Works was designed to speed-up and simplify all relevant applications and to improves customers' profit margins.

The Laser Genius combines the flexibility of Prima Power's Platino machine with excellent dynamic performance and high levels of efficiency and accuracy. Thanks to the imaginative use of materials such as carbon fibre and synthetic granite the Laser Genius is the ideal tool to enable maximum productivity in the cutting of medium-thin sheet metal.

The machine's single, universal lens, featuring a high dynamics focal axis with 35 mm stroke, allows the cutting of all materials and thicknesses, while its optical chain is totally sealed and protected from any contamination. In addition to a quick alignment system (OPC), a Safe Impact Protection System (SIPS), protect the machine's head in the event of a crash.

A wide range of nozzles suitable for a variety of application can be automatically exchanged and a high brilliance fibre laser, from 2 kW to 6 kW, provides over 30 percent wall-plug efficiency, with minimum maintenance and low consumables costs.

The innovative machine's efficiency is further enhanced by the use of high-dynamics linear motors, delivering increased productivity of up to +15 percent when compared to traditional systems. Dedicated software suites (SMART Cut, MAX Cut and NIGHT Cut) optimise the laser cutting process for each application.

Prima Power is a leading specialist in machines and systems for sheet metal working, with one of the widest application ranges in the industry comprising: laser processing, punching, shearing, bending, automation.

Manufacturing facilities are in Italy, Finland, USA and China, from which it delivers machines and systems all over the world. A sales and service network is active in over 80 countries, with direct presence or through a network of specialised dealers.

A family of highly advanced servo-electric solutions for punching, bending and integrated processes is the widest in the world, marketed under the slogan "Energy in Efficient Use".

An undisputed leader in 3D laser machines, Prima Power is among the main world players in the 2D laser segment with a wide range of top performance and highly efficient machines used in a multitude of fields all around the globe. Services are an important part of Prima Power activities and are meant to give a professional, dedicated and effective support to each of our customers all over the world. All products

are developed according to the company's "Green Means" concept, combining sustainability and productivity.

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Reduced lead times and improved quality

Customers of leading sheet metal subcontractor Accurate Laser Cutting are already reaping the benefits of the firm's ground-breaking investment in a new Bystronic Bystar 10 kW fibre laser.

Following the installation of its first 6 kW 4 m x 2 m fibre laser in 2015, the most recent purchase replaced its old CO_2 laser cutting facility to form a full fibre line up at the company's West Midlands headquarters.

"Now that our 10 kW fibre cutting system is in full production, CO_2 technology has lost its place on our shop floor," explains director Jon Till.

With an additional cutting capacity of 3 m x 1.5 m, the high performance equipment is the first machine of such speed and power to be installed in the UK. Through this combination, phenomenal cutting speeds of up to 60 m per minute can be achieved.

"In the bigger picture, these faster processing speeds release more capacity for us to deliver consistently short lead times and offer improved levels of service all round," continues Jon Till.

Having been at the forefront of laser cutting technology for over a decade, the metal profiling expert has built a solid reputation for rapid turnaround times and high quality service.

"In such a competitive market, it is vitally important to react to our customer requirements as quickly as possible," adds director Steve Morgan. "The advanced properties of fibre technology make this achievable in every way possible. Not only is it far more efficient than our old CO_2 laser, it also offers exceptional cut quality across the entire thickness range."

The 10 kW machine is capable of clean cutting mild steel up to 15 mm. This is ideal for customers who require an oxidation free edge on their parts for any further secondary operation processes. It can also process non-ferrous materials such as copper and brass to a superior standard, as well as aluminium and stainless steel up to 30 mm thick.

(left to right) Jon Till with Steve Morgan in front of their new ByStar Fiber 10 kW laser

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More powerful lasers for laser cutting

In laser cutting applications, increasing laser power brings multiple benefits such as faster process speed, better quality kerf with thicker materials, ability to process wider range of materials and a broader window of process parameters, allowing OEM manufacturers to optimise the design of equipment, while using cheaper assist gasses and more robust process settings. As a result, the demand is consistently shifting to higher lasers powers. Due to IPG's fibre laser modular design, the laser power is scalable whilst maintaining excellent beam quality, thus increasing the productivity of the cutting machines. The new 10 and 12 kW YLS-CUT lasers from IPG Photonics provide four to five times higher cutting speeds in comparison with 4 kW lasers. As the quality of the optical components is critical to laser performance and reliability, IPG Photonics manufactures all of the components in-house, setting revolutionary standards for industrial kW-class lasers.

Pulsed fibre lasers with nanosecond pulse durations and output power of 10-100 W have been established in materials processing for more than 20 years. Excellent beam quality, high energy efficiency and reliability have made them the tool of choice in marking and engraving. Power scaling has pushed the output power range into several hundred Watt range, allowing these lasers address micromachining applications.

Combining modular power increased the output power into kilowatt range, enabling economical use of pulsed fibre lasers in high throughput surface treatment applications such as cleaning, paint stripping, ablation and texturing. The YLPN-50-120-5000-S from IPG Photonics is the most powerful commercially available pulsed nanosecond laser. With pulse energies up to 50 mJ and average power up to 5 kW, this laser can treat large surface areas without the use of abrasives, solvents and chemicals. Due to its high electrical efficiency the laser is very compact with a footprint of less than one square metre.

The productivity of sheet metal laser cutting machines can be further increased by sequential or simultaneous operation of multiple process areas with one laser source. The new YLS-6000-2FF fibre lasers from IGP Photonics are equipped with two process fibers terminating in two cutting heads. In the time-sharing mode the laser emission is delivered to only one process head at a time, allowing non-stop use of the laser during process set up and material loading. In the energy sharing mode, the laser energy is split between the two process heads at the same time. These flexible concepts maximise the laser use, save time and space, reduce the cost of the equipment and increase ROI.

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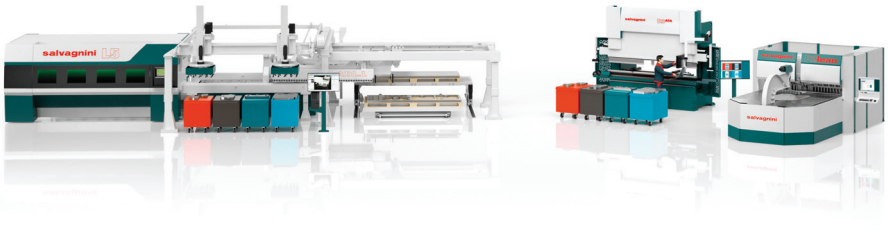
L5 fibre laser is designed for the future

Laser cutting by Salvagnini is Industry 4.0 proof. The most advanced model is called L5, designed with a view to making this cutting system even smarter. This has involved intensive work on the auxiliary functions surrounding the cutting operation, as well as applying new features and improvements to the automated devices, making the laser cutting system the ideal candidate for Industry 4.0.



The refinements are related to the automatic nozzle change, but most of all to the process control, which has been further refined with a view to improving cutting efficiency and reducing waste to zero. Thanks to the adaptive technologies of APC (Adaptive Process Control) the machine can recognise when it is not cutting correctly, stop cutting to correct the relevant parameters and resume work from where it left off, even managing to salvage that part, which would otherwise have ended up as scrap. In the event the same cutting problem is encountered twice more, the L5 system can decide on its own to adopt the optimised parameters as the new cutting standard to complete the cycle in the best possible way.

APC qualifies as a truly smart process management system that joins the features already present for improved initial piercing when cutting medium-heavy thicknesses as well as improved material use. Being able to make smaller and more precise piercings actually means they can be positioned closer to the cutting edges.

L5 also stands out for the extraordinary reliability of certain solutions that are now considered standard features, such as the new compass structure with advanced kinematic system and the Dry Cooling cutting head. Via the compass, the system can achieve dynamics with acceleration as high as 5 g, increasing productivity while keeping consumption and running costs down to very low levels. The latest generation Dry Cooling cutting head also plays a part in achieving these results by actively controlling the temperature of the optics thanks to sensors which measure the thermal gradient on the lens during the cutting phases and ensuring refrigeration of the optics without gas or water.

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www.salvagninigroup.com

HV Wooding brings £100,000 laser cutting in house

Hythe-based HV Wooding, a subcontract supplier of metal components to customer design, has brought laser cutting in house with its acquisition of a 4 kW TruLaser 3030 fibre laser from TRUMPF. The machine will not only save the company £100,000 a year in previous outsourcing costs, but will help fuel HV Wooding's growth plans moving forward, as well as increasing their well-established services, with the ability to offer multiple operations under one roof.

Established in 1967, HV Wooding is a family-owned business that specialises in metal-fabrication in a wide variety of industry sectors including electrical accessories, renewable energy, rail, motor vehicle, aerospace, medical, energy generation and research. Everything is made to customer designs, although the company is able to provide design-for-manufacture advice to help clients reduce costs. Today, the company employs 98 people and generates an annual turnover of around £12 million.

"Over recent years we found ourselves subcontracting a lot of profiling work, and had our eye on a machine for some time," explains technical director, John Wooding.

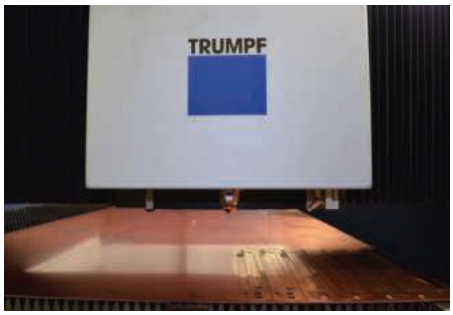
"However, due to the conductivity requirements of the parts, we cut a lot of copper, which meant we were originally thinking about waterjet cutting, as using a conventional CO_2 laser to cut copper is not viable. But then solid-state laser technology arrived. At first we decided to bide our time to test the robustness of the technology in the marketplace, but once we heard of others using solid-state laser-based laser cutters without problems, we began researching the ideal machine for our needs."

HV Wooding's comprehensive range of services encompasses everything from design assistance and prototyping through to hard tooling and large volume production, all located under one roof, providing significant cost savings and administrative benefits for customers. The company's operation is approved to ISO 9001:2008, ISO 14001 and OHSAS 18001, with full traceability guaranteed throughout the production process.

"We knew that the introduction of a laser cutter would sit between our low volume wire EDM processes and high volume press operations. It would also help us provide customers with samples and prototypes extremely quickly." explains John Wooding.

"High definition of product is crucial for our customers, along with high accuracy to the DXF file," says John Wooding. "The TRUMPF machine was duly installed in April 2016, and the commissioning and training went so well that we were cutting parts on the first day. It's our biggest investment in a single piece of equipment and we view it as vital to the future of the business."

Among the tasks for the TruLaser 3030 fiber is the production of busbars, a big growth area for HV Wooding. Today the company produces a huge variety of bespoke busbars for major projects incorporating thousands of variants to single part demand. HV Wooding manufactures copper busbars, aluminium busbars and Cuponal busbars for switchgear components, control panels, panel boards, fuse-gear and transformers, primarily for multinationals and smaller contractors operating within the switchgear, railway, marine and power electronics sectors.



HV Wooding is also using the laser to profile motor laminations for a wide spectrum of industry sectors. Typically laminations are manufactured from electrical steel with the specific grade being dependent on the performance of the engine. Laminations can be anything upwards of 0.1 mm thick. However, the most frequently used thickness is 0.35, all within the machines capabilities.

"Already we are witnessing tremendous accuracy," says John Wooding. "The concentricity between the inner and outer diameters on our motor laminations, for example, is little short of phenomenal."

The TRUMPF laser cutter at HV Wooding adds to the company's already impressive list of in-house services, providing flexibility and value-added opportunities to customers under one roof.

"We were probably subbing out around £100,000 worth of laser profiling work per annum previously and that's with us supplying free-issue material, so we will recoup that immediately," says John Wooding. "In addition, there are all the hidden costs, such as transport to and from our suppliers, which we will also save. Ultimately, however, the biggest benefit is that we can now take on projects that demand the application of many different technologies, including laser cutting, which provides us with genuine market differentiation over conventional laser job shops."

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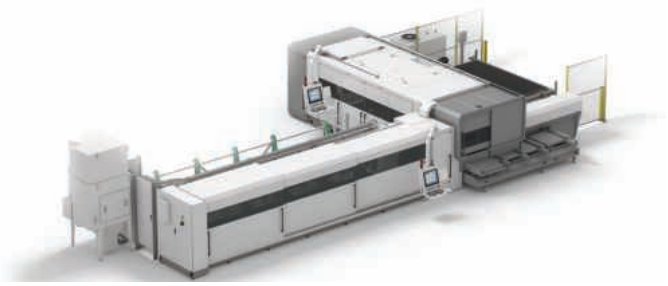
One choice, twice the opportunities

The LC5 is a combined sheet and tube laser cutting system. Compactness, ergonomics, modularity and versatility: these are the keywords for understanding the potentials of a system which ensures non-stop efficient production for cutting sheets and tubes.

The LC5 is compact, because it integrates the electric and electronic parts on the machine in order to reduce clearance and installation time, ergonomic, because it provides large access to the working area and a double control system with touchscreen, modular and versatile because it is has optional units which can be installed to satisfy mutually diverse needs in terms of layout, production and automation.



The LC5 offers the opportunity of using one single laser cutting system to approach two different, distinct markets: tube processing and sheet processing. This is an interesting advantage for workshops wanting to reach out to new customers and for OEMs because they no longer need to outsource for prototyping and making their products.

Being able to switch rapidly from one job to another, combined with accuracy, high quality, automation and speed, are the key elements for obtaining real advantages deriving from combined system use. The LS5 responds to these needs and goes beyond the concept of a sheet cutting system which can also process tubes, or vice versa, by providing two physically separate, modular systems which are combined in one capable of operating at top level for cutting metal sheets and tubes which share a laser cutting focusing head, controlling it as needed.

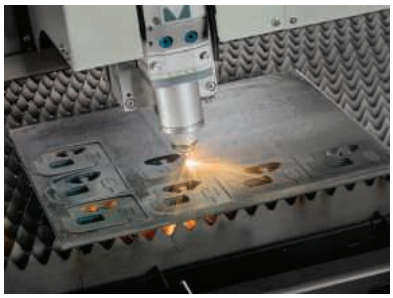
For cutting sheets, the LC5 provides amazing functions and performance, all deriving from BLM GROUP's considerable experience in laser cutting in general and sheet cutting in particular.

Two versions of the sheet cutting LC5 are available: a 3,000 x 1,500 mm version and a new 4,000 x 2,000 mm version. A complete range of automation systems, including loading/unloading systems and/or tower pallet storage systems, are available for both.

The famed modularity and flexibility of ADIGE-SYS systems is fully expressed in the LC5. For defining the layout most suited to the available clearance, for instance, the pallet changer can be arranged either longitudinally for a long narrow system or crosswise making the system shorter and more compact.

The LC5 implements the concepts successfully experimented on BLM GROUP Lasertube machines to obtain the best results for cutting tubes, as well.

The system can be fed with bundles of tubes of diameter up to 120 mm, process each tube individually and then unload the finished parts. The design of the loading system, the pass line with tail carriage and steady rest and the unloading system is based on similar components fitted in Lasertube systems of equal size. The systems form a self-standing whole which share only the laser cutting head. This means that the system performance is identical to that of a Lasertube machine.



The tube processing system can be installed at a later time to complete a system which initially installed for sheet cutting only.

The LC5 is available with CO_2 laser sources of power to 4.5 kW or fibre laser sources of power up to 5 kW. A very complete cutting parameter database is available for both sources to obtain excellent performance in terms of production time, reliability and cutting quality with all feasible materials and thicknesses.

The automatic nozzle changer, the next-generation, high-efficiency nozzles, the assisted centring function and the new Procutter head for fibre laser cutting are only some of the details which allow the LC5 to secure results of absolute excellence.

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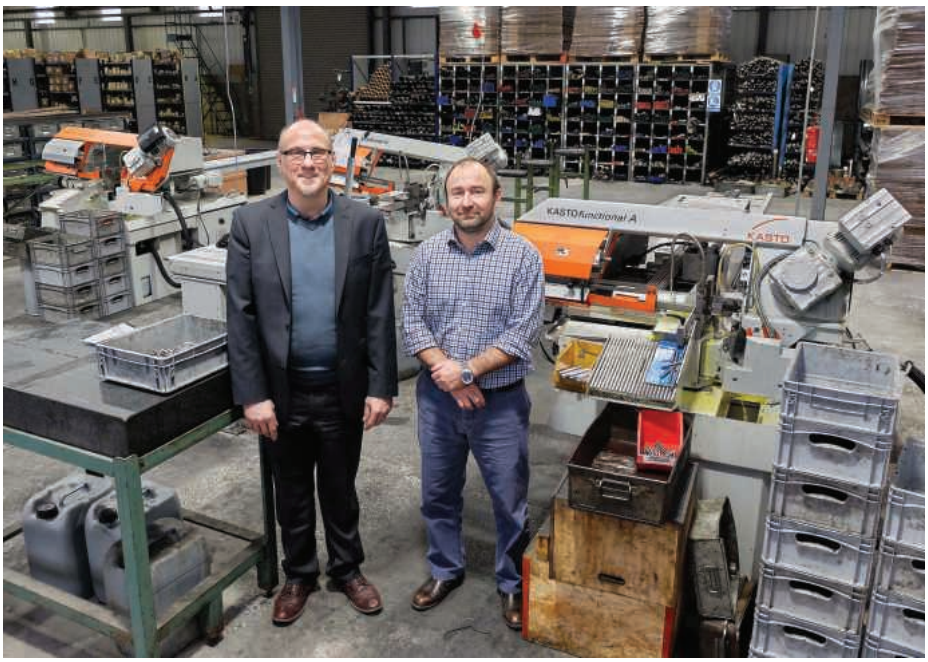
Engineering components supplier automates sawing

One of the UK's leading providers of light engineering components, Stourbridge-based Tasman Industries has acquired two automated, pivoting-bow bandsaws from KASTO, the most recent of which was delivered in December 2016.

These have transformed the efficiency with which the firm cuts bar material in a vast array of metal types and sizes into large batches of up to several thousands. For smaller runs, say 50-off, it relies partly on a similar, semi-automatic saw installed earlier last year by the same supplier.

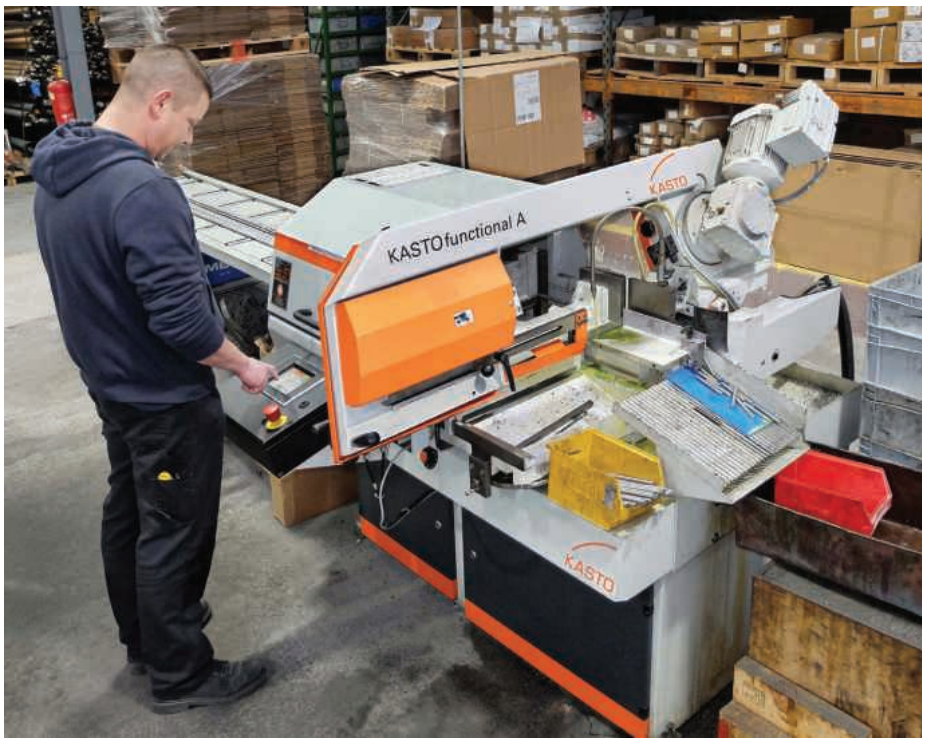
Tasman specialises in supplying shaft keys, keysteel, shaft collars, taper and slotted pins, precision dowel pins, screws and many more products in sizes spanning a few square millimetres in cross section up to 125 mm diameter, 100 mm x 50 mm and 75 mm square. Materials range from steels, including stainless, through nickel alloys and titanium to copper alloys, aluminium bronze, phosphor bronze and brass.



John Bairner (left) and Benjamin Stirling, joint proprietors of Tasman Industries, in the company's new warehouse in Rufford Road, Stourbridge

Established in 1988, the company is currently owned and managed by equal partners John Bairner and Benjamin Stirling. They oversee a complex manufacturing and distribution business involving sourcing raw material and products from all over the world and shipping it to 3,500 customers, 800 of which are active in any given month. Ranging from blue chip multinationals to individuals repairing their lawn mower, they are mainly in the UK but can be found as far afield as New Zealand.

Complicating these activities is the fact that only half of output is standard, the remainder being bespoke specials supplied to customer specification. They require a combination of milling, turning, grinding, laser cutting, heat treating and plating, carried out by around 1,200 subcontractors, only half of which are in the UK. It is truly a global operation.



The Kasto control has touch-screen operation and an in-built database of cutting speeds and feeds to suit all materials in the warehouse

The only machining performed at Tasman's warehouse in the West Midlands is straight and mitre cutting of 200 tonnes of bar material per year. The backbone of this function are two KASTOfunctional A pivoting-bow, automatic bandsaws and a KASTOfunctional U semi-automatic model. They are of solid construction with a robust, torsion-free welded base, capable of cutting material to a maximum of 260 mm round / square. Stock can be mitre-cut to the left at up to 45° and to the right at up to 60°.

John Bairner comments: "We tried moving to automatic sawing a few years ago with the purchase of a circular saw from another manufacturer, but the blade kept breaking, the hydraulics leaked and overall it was not a good experience.

"We went back to using a pair of semi-automatic bandsaws, of which we still use one, but could see the benefits of automation for longer runs.

"So in 2014 we decided to go down the automatic bandsaw route and installed the

first KASTOfunctional A with a roller infeed table, having been impressed with a demonstration at the company's Milton Keynes showroom.

"The machine proved so accurate, reliable and productive that we went for the semi-automatic U version during the first half of 2016 and a second fully automatic model at the end of the year."

A facet of the bandsaws that impresses John Bairner is that the material is fed accurately by a ballscrew drive, as used for axis positioning on mainstream machine tools, rather than via a leadscrew or a hydraulic cylinder.

He also likes the user-friendliness of the KASTO touch-screen control, which allows easy programming of the next cutting job. An in-built database saves time by automatically selecting the correct band speed and rate of downfeed to suit the type and size of material to be cut.

As cutting volumes increase, he will consider buying a bundle clamp for one of the KASTOfunctional As to increase sawing efficiency further when processing bar of smaller cross section. This could happen sooner rather than later, as at the start of 2017 Tasman introduced a subcontract cutting service whereby it will saw to length and mitre cut stock for other companies in the Midlands.

To prepare for this and other initiatives, in November 2016 Tasman bought a new, 25,000 sq ft premises in Rufford Road, Stourbridge, five times larger than its previous facility nearby. The company has also introduced a new business-to-business system on its website **www.keysandpins.com** so that customers can order standard products online.

As a consequence, the firm will be able to spend more time on the bespoke manufacturing side of its business, which it believes to be the main area for growth. Quality will continue to be at the heart of its activities, not only through ISO 9001 accreditation but extending to reliability of service and fast turnaround backed by full lot traceability, certificates of conformance and test reports.

316 stainless steel all-thread bar stock being cut into batches of several thousand on one of the KASTOfunctional A bandsaws for an engineers' merchant in the UK

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The harder the better

Individually designed hi-tech cutting technology reaps major rewards for stainless steel stockholder

When presented with the opportunity of supplying sawing equipment that would drastically reduce cutting times of even the very hardest stainless steel materials, while simultaneously extending blade life, after extensive research, Prosaw developed a startling new sawing system and rose to the challenge.

Established in 1987, Sheffield-based A D Bird Stainless Ltd supplies specialist stainless steel materials and products ranging from precision ground shafting for use in the marine, petro-chemical and automotive industries, to an extensive range of cut blanks.

The company specialises in stainless steel bars of up to 12 m in length and 640 mm in diameter, depending on the grade, including conditioned grades such as precipitation hardened stainless steel.

Prosaw's challenge was to design a sawing system that would overcome these tough criteria whilst simultaneously maximising the efficiency of the cutting process of not only those grades previously deemed difficult or near impossible to cut, but of all grades of stainless steel.

After exhaustive research and development followed by comprehensive cutting trials with the manufacturers, Prosaw was satisfied that it had developed a solution to the challenges that it was faced with, by producing a purpose-built new model Mega CS-150SN circular carbide machine that features lower cutting speeds but with a greatly increased torque than is normally available.

The result has been warmly welcomed by the customer, that has benefited from significantly reduced cutting times, an improved surface finish and greater accuracy compared to the company's existing sawing machines.

A D Bird Stainless Ltd's managing director Nigel Bird says: "Cutting times are now that much shorter than before, so much so that the Prosaw CS N machine has made several of our older machines redundant due to the capacity and speed of the new machine. Our overall experience has been very good indeed and when any minor problems have arisen, they have been swiftly solved by Prosaw."

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Deco Automotive invests in new high-performance pipe bending cells

Suppliers to the automotive industry are facing the same challenges world-wide; how to supply their products fast, economically and flexible while considering the individual demands of their customers at the same time. In order to increase the quality of their products and reduce costs at the same time, Canadian supplier Deco Automotive is replacing three existing older bending machines with three state-of-the-art automatic CNC 100 E TB MR VA pipe bending lines by Schwarze-Robitec. The company will profit from the integrated high-performance control system NxG by increasing its output and optimising cycle times.

"Based on their own constant optimising processes, our customers demand high requirements from their pre-products and with that, as supplier our requirements are also increased. In order to provide the customer with products in different versions and large quantities at a consistently high quality, we continuously invest in the further development of our production processes," says Ray Metzner, manufacturing engineer at Deco Automotive.

The company, headquartered in Toronto, Canada, belongs to the global Magna Group and manufactures various automotive components including vehicle frames and structures, and engine cradles. Among the customers of the automotive supplier are international original equipment manufacturers. Deco uses a total of four production lines and manufactures more than 1,750,000 products per year.

The bending cell by Schwarze-Robitec guarantees fully automated production processes, starting with material buffering to weld seam inspection to bending

Project requirements

Due to the continuously high demand and a high annual output, Deco Automotive is dependent on reliable and intelligent pipe bending machines, which provide excellent results in terms of degree of automation, precision, speed, and bending processes. Before being accepted by automobile manufacturers, steel pipes run through the fully automatic cold bending process at the production facility in Toronto. Subsequent manufacturing steps include hydroforming, laser cutting and welding. The number of bending processes performed at Deco reaches 12 million per year. Up until now, the automotive supplier reached this volume by using a total of nine bending machines spread over four production lines. Seven of the machines come from Schwarze-Robitec, whereby three pipe bending machines were already in use for more than 20 years. The reason for the replacement of the old equipment with three new CNC 100 E TB MR VA made by Schwarze-Robitec was for Deco, that the bending and handling process is ensured to continue reliably and efficiently.

"In 20 years, we have purchased a total of 13 pipe bending machines from Schwarze-Robitec and we have come to appreciate the very high quality and durability of the machines. We value the high technical expertise of the employees and the comprehensive services, such as remote maintenance, and decided at the end of 2015 to continue the partnership," explains Ray Metzner.

Automatic pipe bending line

Following an extensive consultation and planning phase in cooperation with Deco Automotive in Canada, Schwarze-Robitec produced three pipe bending lines tailored to the requirements of the automotive supplier. Of the three CNC 100 E TB MR VA machines two machines are right- and one is left-bending. In addition, the multi-stack bending machines are equipped with a pipe magazine, a weld seam finding device, an automatic loading and a removal device.

The electrically operated systems process round and oval tubes that are 2.8 m long and have a diameter of up to 76.2 mm

The electrically operated systems process round and oval tubes that are 2.8 m long and have a diameter of up to 76.2 mm including a wall thickness from 1.2 to 3 mm. The process is fully automated: The pipes to be processed are taken randomly from the tube magazine and fed to the integrated weld seam finding device. This device aligns the pipes in accordance with their weld seam position. Following the alignment, the pipe is passed on to the pipe bending machine. To do this, a mandrel is used which supports the tube on tight radii from the inside. A fully automatic loading arm then removes the finished bent tube from the machine and places it on a conveyor belt.

From there, the tube continues to the hydroforming equipment. Another feature of the solution are the integrated raised, vertical travel routes. This allows pre-loading the pipe bending machine, while parallel to this function a finished bent tube is removed at another location.

NxG high performance control system

Compared to the pipe bending line, which had been in operation at Deco until today, the new machines are equipped with the high-performance control system NxG. An advantage of the new control system are the significantly reduced non-productive times, as individual steps of the bending process were arranged synchronously.

"With the NxG control system, it is possible to prepare the next step simultaneously to executing a machining operation. For example, while a pipe is supplied to the tool, the clamping functions close almost completely," explains Bert Zorn, managing director of

Schwarze-Robitec GmbH. "When the tube then reaches its target position, the tool is immediately ready for the next bending step. This allows users to shorten the cycle times and production objectives are reached more quickly."

In addition, a diagnostic and maintenance tool integrated into the control system minimises downtimes. The intuitive operability, the high performance control system also contributes to an ergonomic and efficient way of working.

The pivoting loader designed by Schwarze-Robitec feeds the bending machine automatically with raw material

The result: short cycle times and no downtimes

Due to the new automatic bending cells made by Schwarze-Robitec, the automotive supplier was able to optimise the cycle times and increase the production output of higher complex shapes and materials.

"With the new pipe bending machines and the bending programs of the control system NxG, we have reduced cycle times significantly," says Ray Metzner.

"With this, the accuracy that the company produces and the repeatability of its equipment in the production process is outstanding.

"The predecessors of our existing machines have been operating in multi-shift operation flawlessly for almost 20 years. In addition, we received continuous services from Schwarze-Robitec, from their engineers in Cologne and the employees of the US subsidiary. For us, this is a win-win situation."

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Deco profits from the integrated high-performance control system NxG by increasing its output and optimising cycle times. The process is fully automated: The pipes to be processed are taken from the tube magazine and fed to the integrated weld seam finding device Roland SND 40

Automated plasma power sources for high precision cutting

ESAB has launched the iSeries of power sources for automated plasma cutting as part of its integrated system of components that deliver higher productivity and lower cutting costs.

Featuring HeavyCut® technology to improve cut quality and precision performance, the iSeries superior cut quality enables parts to go directly from the cutting table to welding, painting or assembly without expensive secondary operations. It also provides piercing capacity up to 50 mm at 400A on all materials including stainless steel and aluminium. The iSeries delivers ISO Class 3 or better cuts on any material from gauge to 50 mm thick, noticeably reducing bevel and the need for post-cut finishing.

The Water Mist Secondary (WMSä) process, which incorporates nitrogen as the plasma gas and ordinary tap water for shielding, produces superior cut quality and a lower cost per cut on non-ferrous materials. On stainless steel, the WMS process cuts up to 300 percent faster and lowers cost-per cut by 20 percent or more compared to systems that use Argon-Hydrogen for the plasma gas.

The iSeries also lowers the cost per cut by using XTremeLife™ Wear Parts for cutting at 300 and 400 amps. These consumables use a multiple hafnium insert as opposed to a single insert and feature a two-piece tip that runs cooler.

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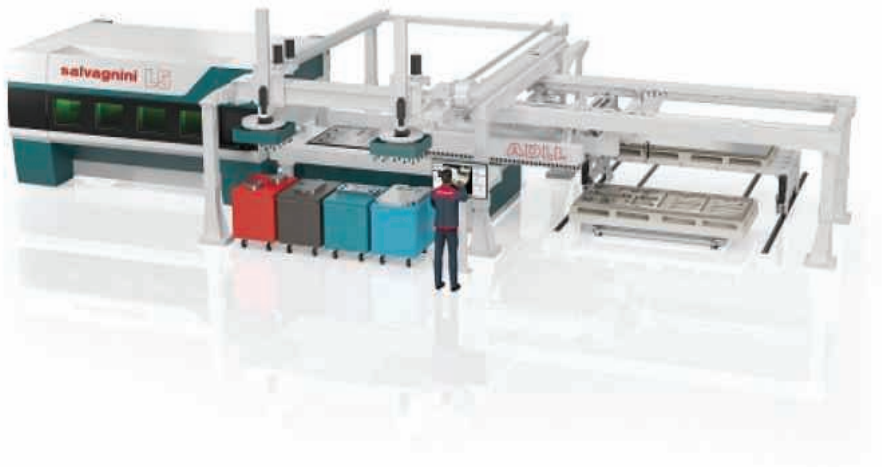
Flexcell: the smart and flexible FMC

The Industry 4.0 production model is the new standard by which machine tool manufacturers were judged at EuroBLECH 2016. Salvagnini presented a comprehensive range of solutions ready to tackle this kind of challenge, most notably the automatic FlexCell cell. This truly smart and flexible FMC that owes these qualities to the integration of three smart machines which have been updated in line with the digital factory model, with all the necessary automated devices and to the use of OPS-FlexCell integration software that optimises its operation.

Salvagnini's take on Industry 4.0 is that the key is not merely getting machines to talk to each other. Instead it has chosen to adopt an approach centred on defining the areas of communication and data use to make systems easy to use, productive, efficient and adaptive, to offer flexible automatic solutions, i.e. capable of catering to market demands and, at the same time, evolving with the customer's business.

The huge development efforts in recent years to make solutions fit and ready for the new challenges posed by manufacturing have led the company to focus more and more on the issues of factory digitalisation, with the aim of achieving productivity, of course, but also giving solutions a wider field of application and, above all, improving ease of use, production, programming and maintenance.



A smart cell with new application horizons

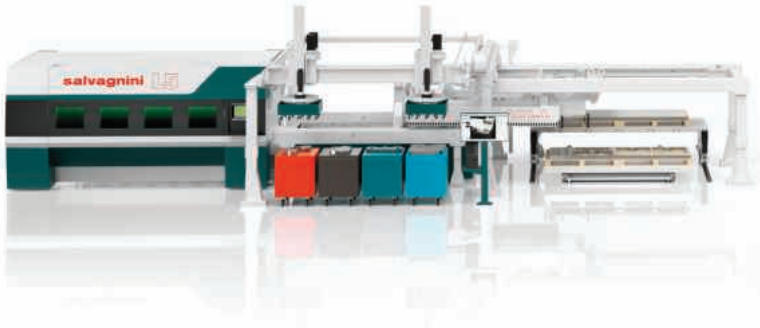
It is good having machines communicating with each other but, above all, they need to be smart in every respect, from the setting stage to the real-time running of the actual bending or cutting stages. This is the Industry 4.0 concept implemented by Salvagnini. So we are talking about adaptive machines for the production process they have been designed for, capable of fully harnessing the opportunities offered by today's digital communication, whether used as standalone machines or integrated in a production flow approach, such as in that embodied by the latest FlexCell cell at EuroBLECH.

After its world premiere at the 2014 event, FlexCell has now been enhanced by application experience gained over the last two years, which has allowed it to keep evolving in terms of usability and ease-of-use.

The success FlexCell is enjoying in the market can be attributed to the customers' focus shifting more and more towards the process. Even in the case of standalone machines, there is a generally increased need to optimise management of flows between flexible machines dealing with steadily shrinking batch sizes, not to mention batch-one processing, with WIP almost eliminated.

The cell presented at EuroBLECH 2016 integrated a L5 laser cutting system, a P2lean panel bender and a B3 ATA press brake. Three smart machines have now been updated in line with the digital factory model, with all the necessary automated devices, whose ability to set themselves up automatically ready for processing and to detect and, if necessary, implement real-time correction of any variation that may be generated either as a result of technical factors (material properties) or production factors (flow sequence), together with OPS-FlexCell integration software that monitors and controls the whole process, resulting in a further boost to the efficiency and inherent ease of this FMC.

"The concept is to have a system that lets you extend the feasibility of what you can produce, by combining a cutting laser, a



panel bender and a press brake, but going beyond the classic cell-based approach to production organization, which typically proves rather inflexible," explains Tommaso Bonuzzi, Salvagnini marketing manager.

"As a matter of fact, cells are generally purpose built according to the product they are assigned to produce, so as to deliver a certain level of efficiency.

"In the case of FlexCell, Salvagnini has instead made flexibility the system's cornerstone, offering an innovative cell made up of smart, versatile machines capable of efficiently producing even a sequence of unique parts, all differing from each other. This opens up the application horizons of this cell, which comes with a management system that helps take its efficiency to a whole new level, thanks in part to its ease-of-use."

FlexCell: all-round flexibility

At EuroBlech, Salvagnini demonstrated the FlexCell cell's potential through an extensive programme of daily interactive demos designed to get visitors involved directly, handing them the control keys. They actually got to choose how and on what to test the FlexCell and thus get a hands-on feel for the enormous potential of this solution. In this way, flows of material can be optimised through an exchange of information that will enable machines to ask for the parts produced by the L5 laser system located upline, where necessary adapting their sequence based on predetermined criteria.

In this specific case, the criterion chosen called for smart stacking of parts organised for kits. Each stack, therefore, was made up of cut semi-finished products belonging to the same product kit due to be finished, downline by the P2Lean or B3 ATA, or even by both machines. That stacked kit was then be transferred to the FlexCell's bending section and processed by the most appropriate machines.

"The customer can use the display to choose which product to produce and the OPS-FlexCell software. Handling feedback from the laser on the positioning of parts required for that given kit will transmit the information to the downline machines, which will set themselves up completely autonomously"

"It is at this point that the FlexCell starts to optimise because it knows how the parts have been stacked, having received the information from the laser, and automatically decides the work sequence based on machine optimisation or how the parts have been set on the stack."

"This is where we see maximum flexibility. The cycle can be optimised based on how parts are stacked upline, or on how machines downline ask parts to be assembled for complex products, or even based on the machines and what sequence it is most logical to use them in to produce that given part."

Speaking after the show In Hannover, Thomas Bonazzi added: We demonstrated this, interacting in real time with the choices made by visitors to the stand who wanted to test its operation, confident in the result. What's the secret? Having smart machines that talk with each other perfectly and are capable of setting themselves up on their own in very little time, most of which is masked."

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Addison brings PBT's high-performance profile benders to the UK

Addison Tube Division, the specialist tube bending technologies arm of Addison Saws, has been appointed as the sole UK distributor of PBT AG's CNC profile bending machines.

Swiss-based PBT is a leading name in high-performance profile bending technologies for aluminium, stainless steel and steel profiles. Its machines are used across a large number of sectors, including automotive manufacturing, construction, aerospace, the windows industry, and furniture making.

"We are extremely pleased to have secured the UK distributor rights for PBT's internationally recognised profile bending technologies," comments Addison Group managing director, Gary Knight. "In appointing us, PBT identified closely with our ethos of helping customers find the very best solutions to their manufacturing challenges, through technologies sourced from the global market place, and all supported by the highest levels of customer service. PBT's machines will dovetail perfectly with our tube bending and end forming technologies from leading Taiwanese manufacturer, CSM."

The PBT Arkus 12 profile bender is now available from Addison Tube Division

High levels of capability

Employing high levels of functionality and triple-roller bending technology, PBT machines cold-form both aluminium and steel profiles in a highly energy efficient manner. PBT profile bending technologies range from the Arkus 12®, a compact, exceptionally powerful machine that bends even the smallest aluminium and steel profiles to extremely tight radii, to larger, heavy duty machines such as the PBT35® and HELIX® models, which are suited to more challenging applications, including profiles for use in plant and vehicle manufacturing, materials handling, construction and architectural needs. PBT also builds bespoke profile bending machines to meet the most demanding of manufacturing requirements.

"The PBT Arkus 12 profile bender has already generated considerable interest from Addison customers across the automotive, windows, technology and metal manufacturing sectors," adds Gary Knight.

"I am convinced that its ability to produce particularly delicate profiles using either steel or aluminium, combined with uncompromising reliability, repeatability and accuracy, will open up exciting new opportunities for many of our customers."

An extensive choice of machines

With the addition of PBT machines to its range, Addison Tube Division now offers what is possibly the most extensive choice of profile bending, mandrel and non-mandrel tube bending machines in the UK. Addison's CSM tube benders include basic 3-axis hydraulic models through to highly sophisticated, 11-axis all-electric machines. The CSM 100TDRE-RBE, a 5-axis, double stack electric hybrid tube bender with electric boost, is able to produce the very tightest radius thin-wall 1xd bends on larger diameter stainless steel tube, a requirement that is increasingly being demanded by 1st- and 2nd-tier exhaust and catalytic converter manufacturers.

Leading the way in tube and profile forming technologies

With a carefully selected range of tube forming technologies, Addison Tube Division offers the accuracy, repeatability and reliability that manufacturing industry demands. The technologies available from the division include CNC all-electric tube and profile bending machines, CNC and NC hydraulic tube and profile bending machines, precision tube end forming machines and CNC wire bending technologies.

The sectors served by Addison's tube forming technologies include: the automotive industry; high-performance exhaust, DPS and catalytic converter manufacturing; aviation; shipbuilding; street furniture production; dairy equipment, windows and furniture making; HVAC; the oil and gas industries.

Addison Tube Division is an arm of metal cutting technology specialist Addison Saws. The Addison Group comprises of Addison Saws and leading sawblade supply and re-manufacturing business, Dynashape.

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EuroBLECH success for SafanDarley

SafanDarley offers the most complete range of electronic press brakes in the world. As the inventor of the E-Brake, SafanDarley has continuously increased its lead and developed its unique machine concept further into a number of ranges, with a pressure force of 20 to 300 tons and working lengths of 850 to 4,100 mm.

SafanDarley premiered the E-Brake 200T 4100 ATC at EuroBLECH. This E-Brake is equipped with an automatic tool changer and provides a flexible solution for the production of small batches.

It also presented a new generation of the hugely successful E-Brake called Ultra. The E-Brake Ultra series has a completely new design and is equipped with CNC crowning. During the exhibition the first E-Brake Ultra was sold to Oreel Hallum BV in the Netherlands. By mid-November, the E-Brake Ultra was in operation at the customer's site.

The E-Brake Ultra 130-3100 is equipped as standard with CNC crowning, enabling the highest precision even when the V die is less than 8 x material thickness . The E-Brake Ultra was delivered with a 3D back gauge which can be used over the whole width of the machine. The E-Brake Ultra has a completely new design and has a dual screen monitor helping to create a paperless environment.

Founded in 1855, Oreel specialises in the processing and finishing of steel, stainless steel and aluminum. In order to respond to current market developments Oreel has high quality modern machinery. As experts in sheet metal, Oreel has a large number of press brakes. With the addition of the E-Brake Ultra, Oreel can respond even more quickly to customer demand and maintain the quality.

Also introduced at the Hannover show was the new energy saving press brake, the H-Brake Hybrid. These H-brakes are equipped with an innovative hybrid drive; a combination of hydraulics and electronics.

The EC40 Smart is the latest software innovation from SafanDarley. In addition to EC20 functionality the EC40 Smart has the ability to draw on a mobile device 3D model (Designer), to read-in 3D drawings, to unfold and to carry out a bending simulation.

Besides the machine and software innovations, the company demonstrated the new SafanDarley Eye system, showcased in combination with the Microsoft Hololens. With the use of Augmented Reality, productivity can be increased.

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New XFT 2500speed for highest fineblanking requirements

The reinforced model of the XFT 2500speed press from Feintool offers an effective solution for the special challenges in fineblanking production and sets new standards. It is equipped with stronger knuckle joints, increasing the press force at the tip to 3,000 kN (time-limited). For the user of the XFT 2500speed, this modification means new possibilities in fineblanking production. Due to the additional reinforcement, this model is also suitable for parts made of high-tensile materials with thicknesses of up to 8 mm at more than 100 strokes per minute. This means a lower load on the press during operation with conventional tools and greater flexibility due to the occasional use of tools with higher power requirements.

In addition, Feintool has equipped the new XFT 2500speed with a lot of innovations that ensure the highest productivity and perfect quality of the fineblanking parts. This includes increased stiffness and a quick-change system for tools. The latest control technology and innovative energy management are also part of the new press model. In addition, the new XFT 2500 speed is equipped with FEINmonitoring, the intelligent analysis and maintenance tool and Feintool's contribution to industry 4.0.

A video of the XFT 2500speed in practice can be viewed at **www.feintool.com/powerpackage**

Feintool is a world leading technology group specialising in the development of fineblanking systems and the production of ready-to-install fineblanking and forming components, notably for the automotive industry. The Group maintains close partnerships with its customers across the entire fineblanking and forming process - from component design, tool making and system construction through to large-scale series parts production. In addition to fine blanking, the Feintool Group also deploys other key processes such as precision forming and orbital technology, and is the world's only supplier of all-round solutions for the cost-effective manufacture of complex precision components.

The new version of the XFT 2500speed from Feintool offers new possibilities for fineblanking production

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Renishaw 3D printing technology increases Land Rover BAR's performance

Like many other cutting edge technologies, for example, artificial intelligence, big data analytics, additive manufacturing (3D printing) has been incorporated into daily use at Land Rover BAR with the help of the team's Technical Innovation Group (TIG). In this case, TIG partners Renishaw, a global metrology innovation leader, which manufactures metal additive manufacturing machines as well as working with the more familiar 3D printing in plastics for its own prototyping.

TIG project manager, George Sykes of PA Consulting comments: "We use 3D printing at three different levels within the team. The simplest level is as a prototyping and visualisation tool. We manufacture a large number of custom parts and 3D printing allows us to make full size prototypes in-house before we commit to a design."

The 3D printer sits in the Land Rover BAR design office and, with little more than the click of a mouse, will create a plastic version of almost anything the designers plan to create.

"The prototyping process is really useful when we are trying to develop something," says Land Rover BAR's chief technology officer, Andy Claughton. "It allows us to get our hands on it, put it in place on the boat or link it up with other parts of the system, see potential issues and refine the design before we commit to the production of the final piece."

The team has its own, fully equipped traditional machine shop as well as an extensive composites team. Between them, these facilities can make almost anything,

but if the final part can be 3D printed then that's the option that will be used. One of the big advantages in the system is that the cost can be significantly reduced.

One example is the end cap for the boat's bowsprit. This is a complex shape, designed to reduce the aerodynamic drag. It was ideal for 3D printing in plastic because there was no load involved and a single item was required. In years gone by, this would have been built in carbon fibre to the finish and standard of a piece of custom furniture at great expense, thanks to the time and skill of those involved. Now, once the design has been developed it can be produced in a handful of hours for a few pounds.

"The top level of our 3D printing programme is the metal additive manufacturing supplied by Renishaw," continues George Sykes. "The manufacture of custom parts in metal is the cutting edge of this technology."

The components are manufactured from paper thin layers (typically 0.05 mm) of fine metallic powder (cornflour consistency). The system works in an argon inert atmosphere, similar to that inside a light bulb. Heat can be applied to melt the metal powder without it burning, reacting with oxygen or impurities found in air. The heat is applied using a laser beam. This is directed using software controlled mirrors and focused to accurately weld the areas required to create the part.

One of the earliest components the Land Rover BAR team created using this technology was a custom sheave case for the pulley in the daggerboard lift line. There was a high compressive load involved and it needed good resistance to wear, so metal was the ideal choice. All high strength metals have a higher density (weight per volume) than carbon fibre, so to keep weight down the final design was hollow. It would have been very difficult to make this part any other way than additive manufacturing.

"The potential of additive manufacturing in terms of saving weight and improving efficiency is tremendous," explains Andy Claughton. "For example, we took a long hard look at our hydraulics system. Before 3D printing came along all the parts in this system would have been manufactured by taking metal away from a solid block. The shapes that you can create with this method are limited, as is the design and therefore the efficiency.

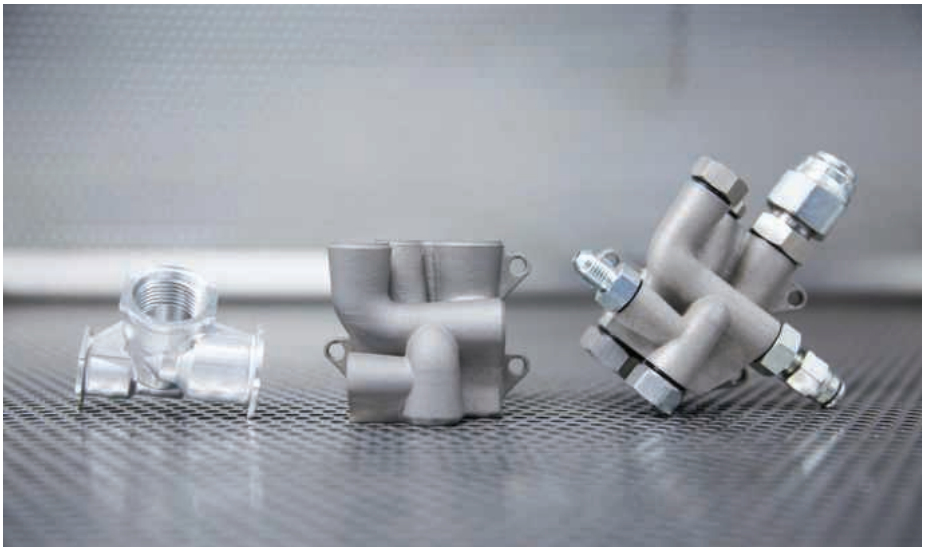
"Hydraulic fluid doesn't take kindly to going around hard corners, for instance, and there is a loss of power when it has to do so. With traditional techniques, this might be the only way you can manufacture the part, but with additive manufacturing you can build it with smooth rounded corners that significantly improves efficiency in the fluid transfers involved.

"In addition to the improvements in

efficiency, we can now build it much more lightly as we are only adding material specifically where it is needed. In the past, the geometry of manufacture on a lathe or other cutting tool meant that some material couldn't be removed and we would have to carry around the excess weight. This is no longer the case."

Renishaw has manufactured several parts for the hydraulics and, while the team are reluctant to reveal too much design detail, it has said that weight in a new AM manifold design was reduced by 60 percent, with an increase in performance efficiency of better than 20 percent.

David Ewing, product marketing engineer at Renishaw's Additive Manufacturing Products Division, comments: "Our involvement with Land Rover BAR is also helping to raise the bar in additive manufacturing. It's a complex manufacturing option and there are considerations both in component design and process expertise. The best applications are ones which use the minimum amount of material to achieve the design requirements, offer a functional benefit in service and have been designed with the manufacturing method in mind. Our work on



hydraulic parts for the team is a perfect example."

"Renishaw is at the top of this particular game and they have really helped us out with their facilities. This is one technology that's here to stay and its role within our build processes will only increase in the future," concludes Andy Claughton.

For further information on Renishaw metal additive manufacturing, contact:

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www.renishaw.com/additive

For more information on Land Rover BAR Technical Innovation Group, visit:
http://land-rover-bar.americascup.com/en/technical-innovation-group.html

Additive manufacturing process receives approval

3T RPD produces the UK's first Additive Manufacturing (AM) PPAP Warranted part for a production car

3T RPD has produced what it believes is the first ever Additive Manufacturing (AM) part to receive a PPAP (Production Part Approval Process) Warrant for fitting on to a UK manufactured production car.

The receipt of the first AM PPAP Warrant is a vital step for any automotive part and a significant step forward for the UK's AM industry. A PPAP Warrant is the approval that components need to receive before they can be fitted to a production vehicle. 3T's PPAP Warranted component has been manufactured for automotive Tier 1 supplier, Titan Motorsport and will be fitted to a new car manufactured by one of the UK's automotive companies for export across the globe.

The PPAP production methodology was developed by the US Automotive Industry Action Group (AIAG) in 1982 to ensure that US vehicles could compete, in terms of quality, consistency and reliability with the best in the world. It has since been adopted by automotive manufacturers worldwide to ensure that automotive parts are made to the most rigorous and consistent standards. PPAP is a high barrier for a component manufacturer to overcome and the 3T production and quality teams have been working towards producing an AM part which meets the PPAP standards for several months.

CEO of 3T RPD, Ian Halliday says: "We have been producing parts for the aerospace industry which have received flight approval for some time. It is therefore very pleasing to see that 3T's production rigour and consistency has been recognised with the first PPAP Warrant for an AM production part." He hopes that this Warrant will be the first of many as 3T RPD ramps up and expands its AM production capacity for metals and plastics.

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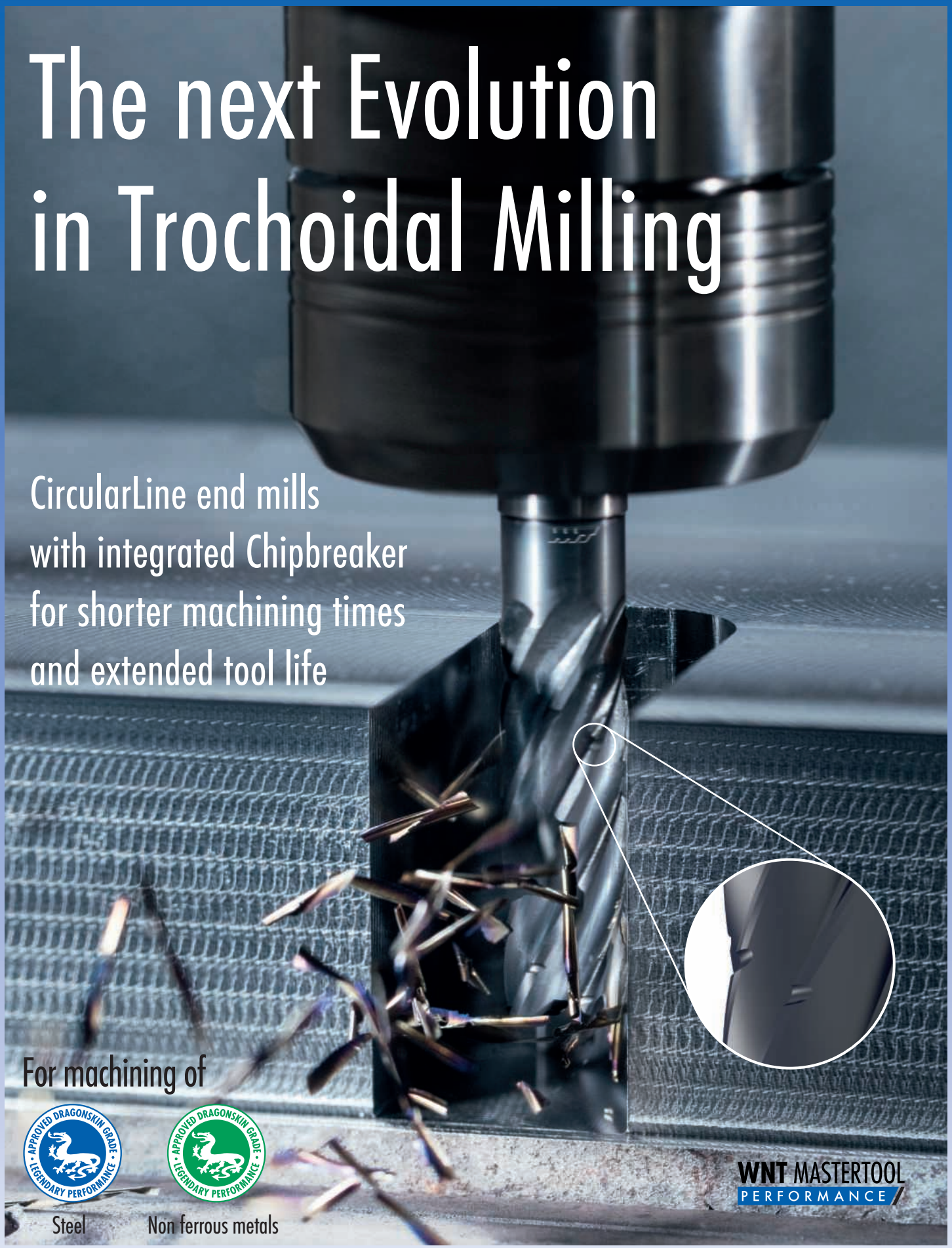

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