ENGINEERING subcontractor FEBRUARY 2016

Expand your capability

High performance 5-axis measurement for non-contact applications.

For further information please visit www.renishaw.com/rvp

RENISHAW
apply innovation™

Renishaw plc New Mills, Wotton-under-Edge, Gloucestershire GL12 8JR
T +44 (0)1453 524524 F +44 (0)1453 524901 E uk@renishaw.com
www.renishaw.com

TaeguTec Get Inspired!

MACH 2016
11-15 April
NEC • Birmingham UK
machexhibition.com

Stand 5763

TaeguTec UK Ltd.
Waterside, Wetherby Grange Park, Boston Road, Wetherby LS22 5NB, United Kingdom
☎ +44-1937-589-828 ✉ info@taegutec.co.uk ⌂ www.taegutec.com

TaeguTec
Member IMC Group

ENGINEERING subcontractor FEBRUARY 2016

VOLUME 13 | No.2 ISSN 1742 -5778

www.rbpublishing.co.uk

CONTENTS

NEXT ISSUE MARCH 2016

MACH 2016 PREVIEW

AEROSPACE REPORT

CADCAM

DEEP HOLE DRILLING

LASER CUTTING

WORKHOLDING

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

Publisher: Roger Barber
Email: roger@rbpublishing.co.uk

Assistant editor: John Barber - 01403 242803
Email: john@rbpublishing.co.uk

Accounts: Jackie Barber - 01403 563791

Production manager: Anna Rodrigues - 01472 210712
Email: studio@rbpublishing.co.uk

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

New non-contact vision probe for the REVO multi-sensor system

Renishaw has announced the launch of a new vision measurement probe (RVP) for use with the new REVO®-2 5-axis measurement system on coordinate measuring machines (CMMs). RVP increases the multi-sensor capability of REVO-2 by adding non-contact inspection to the existing touch-trigger, high-speed tactile scanning and surface finish measurement capability of the system.

For certain applications, non-contact inspection provides clear advantages over traditional tactile probing techniques. Thin sheet metal parts or components with large numbers of holes as small as 0.5 mm and parts which are not suited to tactile measurement can be fully inspected with the RVP system. RVP also gives exceptional improvements in throughput and CMM capability by utilising the 5-axis motion and infinite positioning provided by the REVO-2 head.

The RVP system comprises a probe and a range of modules that are automatically interchangeable with all other probe options available for REVO-2. Data from multiple sensors is automatically referenced to a common datum. This flexibility means that the optimum tool can be selected to inspect a wide range of features, all on one CMM platform.

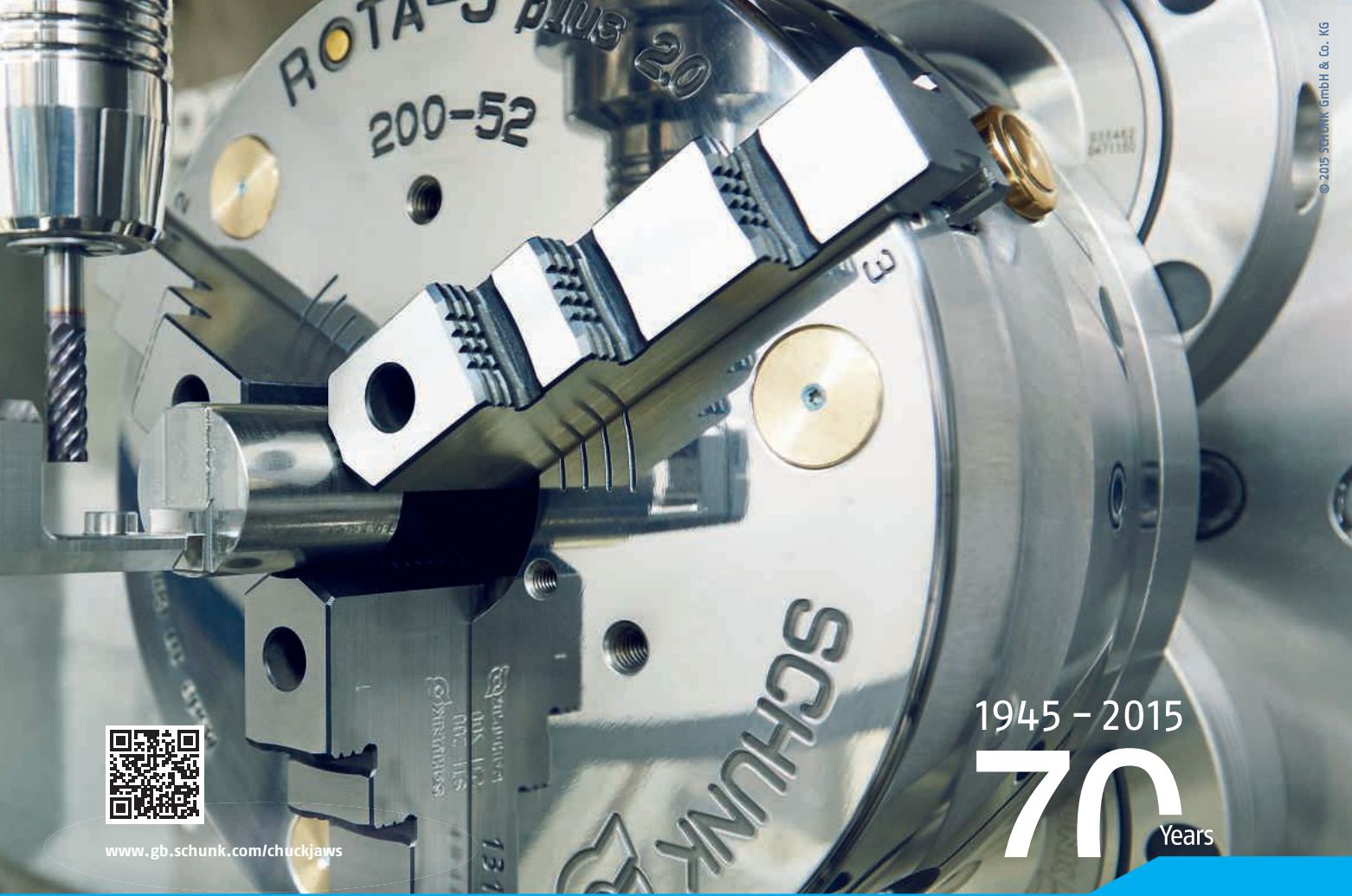
When using RVP, part illumination is provided by integrated programmable LED lighting inside each module. Background feature enhancement is also available using backlighting combined with bespoke part fixturing.

The RVP system is managed by the same I++ DME compliant interface as REVO and full user functionality is provided by Renishaw's MODUS™ metrology software.

New MODUS vision software capability includes RVP configuration, image processing with application specific options and automatic image storage for review and further analysis.

REVO-2 is a new improved version of the revolutionary REVO multi-sensor 5-axis measuring head for use on CMMs. REVO-2 and its new CMM controller UCC S5, build upon the successful REVO multi-sensor system with enhanced power and communications capability to carry the latest REVO sensors such as the RVP vision measurement probe. The head also has an increased range of movement in the negative A-axis which can improve part access and reduce the complexity of stylus setups.

Renishaw plc
Tel: 01453 524524
Email: uk@renishaw.com
www.renishaw.com



www.gb.schunk.com/chuckjaws

1945 – 2015
70 Years

Superior Clamping and Gripping

SCHUNK®

1,200 Standard Jaw Types from a single Source

The world's largest selection, for every conceivable use, of power chucks and toolholders from a single source

High tech from a family-owned company

100% individual
Customized chuck jaws
internal clamping, axially alternating.

Jens Lehmann, German goalkeeper legend,
SCHUNK brand ambassador since 2012
for precise gripping and safe holding.
www.gb.schunk.com/Lehmann

SCHUNK claw jaws

PRONTO Quick-change jaw system

Stepped jaws

Just six weeks to go

Excitement levels are building with just six weeks to go until the doors open on MACH 2016, the UK's premier manufacturing technologies event. The NEC in Birmingham will host the exhibition between 11th–15th April and hopes are high that the 2016 edition of the show will surpass the double award winning 2014 exhibition.

Sales of space at this year's event have already passed 2014's square metres sold mark. Hall 5 at the NEC is now completely sold out and Hall 4 has only limited space available. With over 600 exhibitors expected at the show, of which 130 will be completely new to MACH, the event is shaping up to be a pivotal point in the UK manufacturing calendar for 2016.

MACH is unique in the sense that it showcases live working machinery and brings together the industry's finest manufacturers across a range of technologies including: milling, turning, metrology, additive manufacturing and tooling, to name but a few. With live demonstrations and a packed seminar programme the MACH 2016 is the place to get business done.

The seminar programme will be supported by two dedicated theatres and will feature informative talks by some of the industry's best known OEM's and institutions including Airbus, Messier-Dowty, McLaren, Cranfield University and HS2. On the Wednesday of the exhibition (13th April) the seminar programme will take an in-depth look at Industry 4.0 and on the Thursday (14 April) it will turn its attention to additive manufacturing with a particular focus on the 3D printing revolution.

James Selka, CEO of the Manufacturing Technologies Association, says of the event: "MACH 2016 has all the hallmarks of being a fantastic showcase for the UK's advanced manufacturing technologies sectors. With working demonstrations of machinery, a compelling seminar programme and some of the finest names in manufacturing all under one roof, visitors to this edition of the exhibition will need more than one day to experience everything show has to offer."

Tony Dale, technical director of Mills CNC Ltd, says: "We are delighted to be returning to MACH in 2016. As one the largest, longest standing, exhibitors MACH 2016 really is an unmissable exhibition for the UK manufacturing technologies sector."

For the third consecutive show, Lloyds Banking Group are headline sponsors of the exhibition. David Atkinson, head of manufacturing, SME Commercial Banking, says: "Manufacturing is a hugely important sector to Lloyds, as it is to the UK economy as a whole. It is natural therefore that the Bank is so supportive of MACH 2016. MACH is the biggest event of its kind in the UK and the hub for the nation's advanced manufacturing sector. It provides an opportunity for Lloyds to interact with a huge number of key players in the sector as well as thousands of manufacturing businesses. Of course we're keen to help those looking to invest but even more importantly it is an opportunity for us to learn more about the sector and those operating in it."

As well as showcasing new technologies and the latest products, MACH 2016 will also be welcoming the next generation of talent to the exhibition. A dedicated Learning and Development Zone will act as a base for student visitors as well as housing some key exhibits and a showcase of MTA Members' apprentices and graduates at work. The MTA is delighted to announce that Sandvik Coromant will once again be sponsoring the Zone, demonstrating its support for bringing young people into the industry. Featured organisations within the Learning and Development Zone include the AMRC, the Bloodhound SuperSonic Car, the Ministry of Defence as well as a chance to see the next generation of engineers in action with Apprentices at Work demonstrations.

MACH was established more than 100 years ago by the Manufacturing Technologies Association (MTA). It is the largest manufacturing technologies event in the UK, attracting in the region of 600 exhibitors and more than 23,000 visitors. The biennial exhibition brings together the latest developments and best innovations. MACH provides manufacturers of all sizes and sectors the chance to network with key clients and prospects as well as gain insight into their needs and future vision for supply chain manufacturing. For more information visit **www.machexhibition.com**

MTA Tel: 020 7298 6400
www.mta.org.uk

New method for faster cheaper blisk machining at MACH

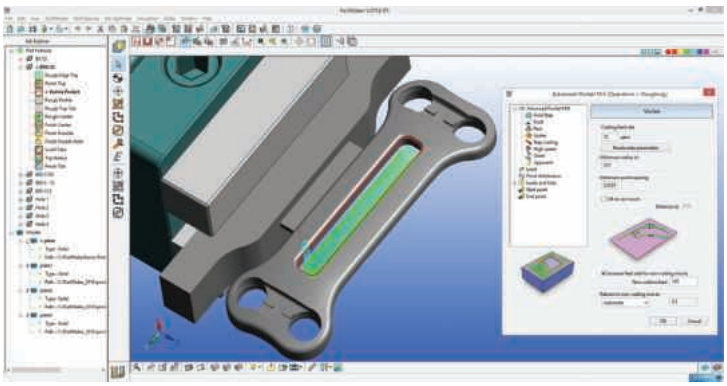
Among the many new developments to be shown by Delcam at MACH will be a new method for machining blisks that offers substantial savings in both cycle time and cost. Developed by Delcam in association with tooling supplier Technicut, it covers the machining of the blisk from start to finish and combines new tooling concepts from Technicut with advanced machining strategies in Delcam's PowerMILL CAM software for the rough, semi-finish and finish machining of integrally bladed rotors.

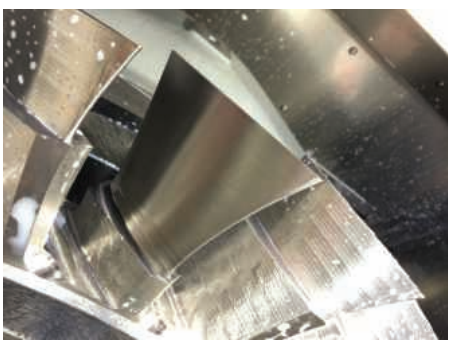
In the example to be displayed at MACH, the cycle time was reduced to 35 hours, less than half the time that would have been needed using conventional methods, while the costs for milling were reduced by 45 percent. The initial billet was 804 mm diameter Ti6-4 titanium, while the completed blisk has 31 blades, each 84 mm in length with a root radius of 4 mm and scallop height of 10 µm.

A video of the new process can be seen on the Delcam AMS channel on YouTube at: **www.youtube.com/watch?v=W1nqbQHV1Ew**

Blisks are used increasingly in place of a series of individual blades fixed into a central hub. They offer advantages in weight, efficiency and through-life servicing but are challenging to manufacture because of their highly complex shapes and the hardness of the materials used, usually titanium or nickel alloys.

As with most machining projects, the new blisk machining method comprises roughing, semi-finishing and finishing operations. The initial rough machining operation cuts between the blades with a series of slotting cuts using Technicut's new Titan X-Treme Ripper endmill. As well as removing the bulk of the material between the blades, this operation relieves any stresses in the billet introduced during the forging process. Both the semi-finishing and finishing operations on the individual blades are then undertaken in a series of vertical sections, working from the tip downwards. The lower sections are left in the rough state to maintain the stiffness of the blade in the area being machined and so to minimise push-off of the blade tip by the cutter.





In addition to the specific toolpaths for blisk machining in PowerMILL, the key to the new method is the use of barrel cutters from Technicut for both semi-finishing and finishing. The tooling designs incorporate a much larger radius on the cutting surface than the ball-nose cutters that would normally be used and so can achieve the same cusp height with a stepdown up to three or four times as large. This larger stepdown means fewer cutting passes are needed to achieve the target smoothness in the surface, meaning that machining times can be reduced significantly.

Delcam releases game-changing PartMaker 2016

Delcam has released the latest version of its PartMaker software for programming CNC mills, lathes, wire EDMs, turn-mill centres and Swiss-type lathes. PartMaker 2016 represents a total game-changer in the field of CAM software for production machining, offering an unprecedented level of power and ease of use.

Major highlights of PartMaker 2016 include powerful 2½ axis milling strategies, support for the import of multiple solid models into a single PartMaker CAM project file, specialist support for broaching, and faster 2D CAD drafting and toolpath selection.

In addition to these technologies, PartMaker Version 2016 includes over fifty additional new features and enhancements. Comprehensive details on all the new features and functionality in PartMaker can be found at the PartMaker Version 2016 learning zone at **www.delcam.tv/pmk2016/lz/**

The new milling toolpath technology included in PartMaker 2016 offers an unprecedented combination of power and ease of use. It allows users to create highly efficient and sophisticated toolpath strategies without even requiring a solid model.

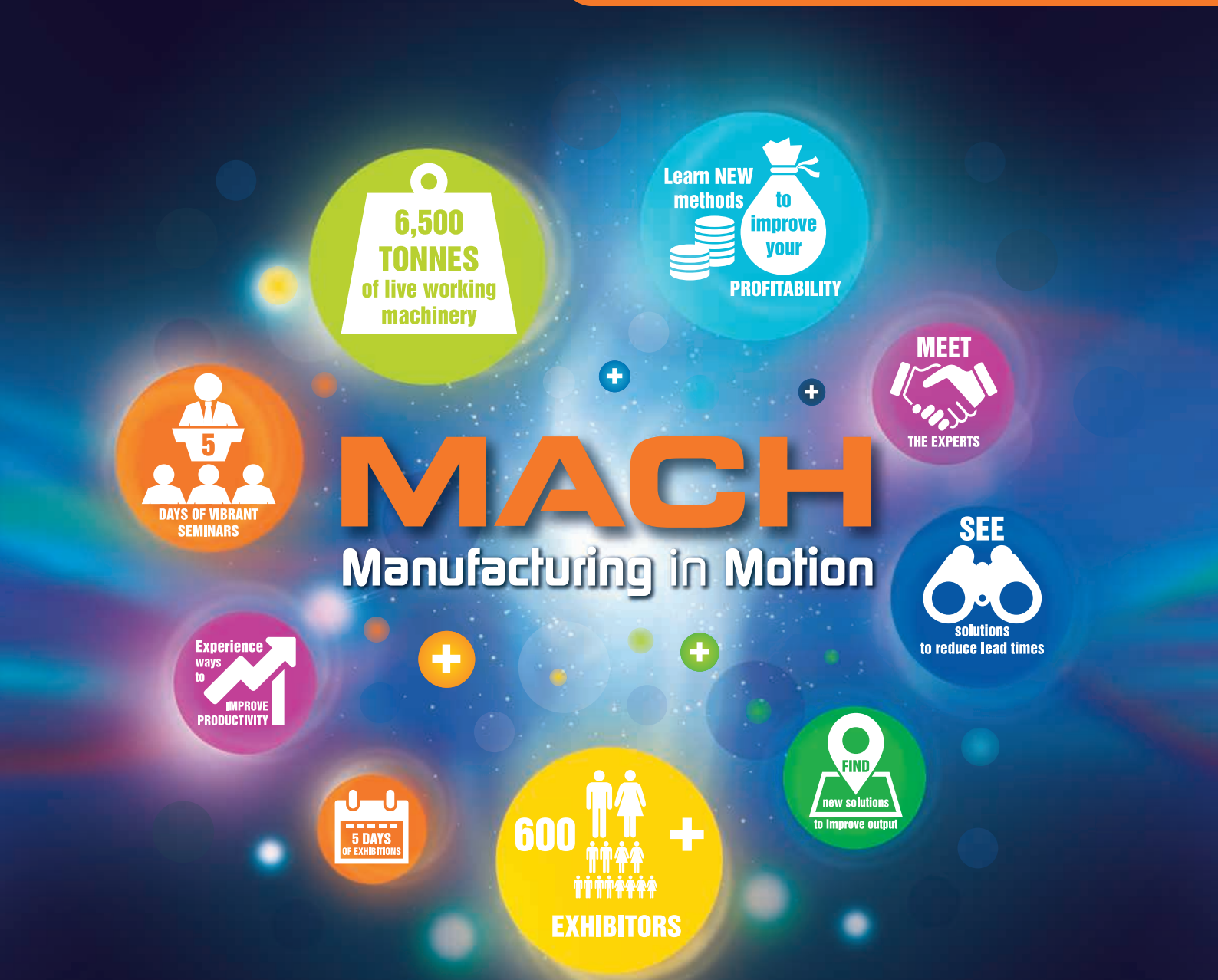
PartMaker 2016 also offers users the ability to import multiple solid models into a single PartMaker CAM project file (*.JOB file). Additionally, this new functionality lets users quickly extract multiple parts from an imported solid assembly and so allows more flexible programming of complex parts as well as improved ability to manipulate milling workholding in PartMaker's CAM environment.

PartMaker 2016 also includes the CAM software industry's first, dedicated functionality for broaching. It automates the programming of both index and rotary (also known as wobble) broaching operations in an intuitive and visual manner. The software allows broaching operations to be simulated using powerful, 3D simulation.

Delcam Ltd
Tel: 0121 683 1081
Email: marketing@delcam.com
www.delcam.com

MACH • Hall 4 • Stand 4011

THE UK'S PREMIER MANUFACTURING TECHNOLOGIES EVENT



MACH 2016 – where manufacturing begins

Meet over **600 exhibiting companies** showcasing their latest products and services ■ Experience over **6,500 tonnes** of live, working machines demonstrating the latest techniques and solutions ■ See the **latest products** and **developments** relevant for your sector ■ Find a broad range of **new technologies**, learn new techniques and find solutions to your manufacturing challenges ■ **Meet** and **network** with like-minded people ■ **Participate** in the show's **vibrant 5-day thought leadership seminar programme**

Register today for your **free Fast Track ticket**

visit **machexhibition.com**

MTA

Organised by the industry, for the industry

Sponsored by LLOYDS BANK

Double Award Winning Exhibition

The Association Excellence Awards 2015 WINNER Best Association Exhibition

Trade Association Forum 2015 BEST PRACTICE AWARDS WINNER

MACH 2016

11-15 April

NEC • Birmingham UK

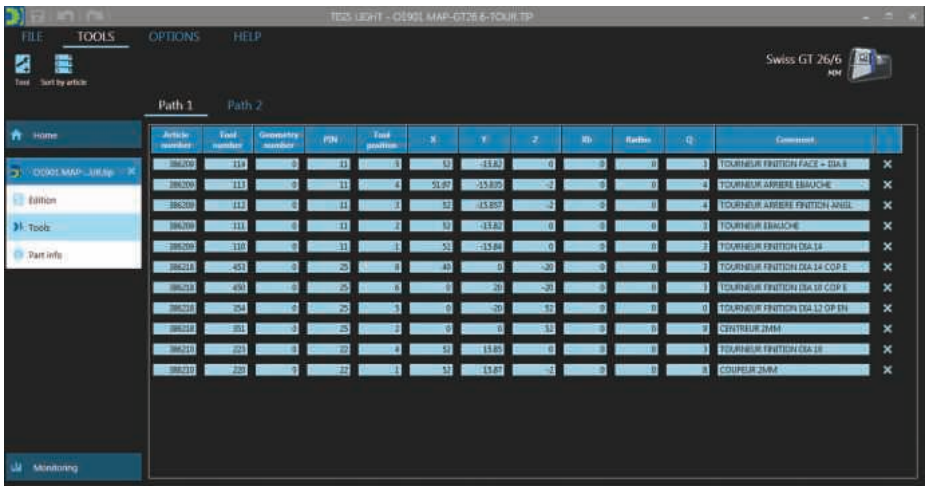
machexhibition.com

Tornos' TISIS software is ready for MACH

With 'Industry 4.0' being the most recent buzzword in the sector, Tornos UK will be giving a UK exhibition debut to its TISIS 2.0 software package at MACH 2016. As the first machine tool builder to embrace the 4th industrial revolution, the programming and machine management software designed for all Tornos products conforms to Industry 4.0 and will be demonstrated throughout the exhibition on stand 5749.

The concept of Industry 4.0 is quite simple. By adding sensors and intelligence at various positions in the manufacturing process, the "factory" has the ability to communicate with peripheral systems as well as with the machine for the purposes of optimising processes and developing operational improvement. Against the background of this continuous data flow, the role of the operator changes whereby they can remotely monitor the production and intervene when necessary.

To aid the management of such situations, the operator will get more and more interactive means of interfacing with the machine and intervention will no longer be confined to a simple keyboard. With TISIS i4.0, the operator already has remote access via tablet and smart phone technology.



Viewing all machine related data as well as the production monitoring data in real time in accordance with the Industry 4.0 standards, is simply and easily obtained via clear and uncomplicated graphics.

The TISIS package has continually evolved since its launch some two years ago, with TISIS 2.0, the next generation package recently receiving its world premiere at EMO in Milan. In 2015, Tornos unveiled TISIS 1.6, a system for users that only needed ISO editor facility and didn't require any of the other available software features that are now on offer. This version was well received and responding to market demands, Tornos now offers two TISIS versions, the full version and a simplified version called TISIS Light.

The next generation TISIS 2.0 technology means that from now on tool setup is possible using a plug and play camera that can be easily installed in the machining area. The video streaming function of the camera via the TISIS application provides a view into the heart of the machining area from wherever you are. Thanks to the monitoring function and a preliminary calibration sequence, this camera can also be used for measuring purposes, which is available as part of the Connectivity Pack.

A library function for ISO machining processes comes equipped with a certain number of elements. However, users can add to this with their own machining processes. Program creation is much faster, as writing the complete part program is no longer required and only the dimensional values of the program must be adapted, which drastically reduces the risk of errors.

For users of iOS products (iPhone, iPad) that want to monitor their machine fleet or an individual machine using their preferred Apple device rather than Android based technology, TISIS 2.0 also caters for these customers.

To discover how the fourth industrial revolution fits into the modern machine tool, visit the Tornos stand at MACH.

At its technology centre in Coalville, near Leicester, Tornos UK has a team of highly experienced applications and service engineers to ensure you receive impeccable levels of support.

Tornos UK supports the UK and Ireland markets for Tornos SA, a world leading manufacturer of turning centres. Its product lines include sliding headstock mill-turn centres, multi-spindle lathes and specialist machining centres. With what is regarded as one of the world's largest ranges of turning centres below 38 mm bar capacity, Tornos UK can offer a highly productive solution to your turning requirements, developed and built to the renowned high quality standards and specifications that can be expected from a Swiss Manufacturer. Specialist services are also available in the form of machine and equipment financing, ensuring that your investment is cost-effective.

Tornos UK Ltd
Tel: 01530 513100
Email: sales@tornos.co.uk
www.tornos.com

MACH • Hall 5 • Stand 5749

Mazak

Your Partner for Innovation

DONE IN ONE

It's all about you

INTEGREX i-200ST

Higher performance and greater workpiece capacity

INTEGREX i-200ST is equipped with the SmoothX CNC control which has been developed for high performance 5-axis machining. Smooth Technology dramatically reduces cycle times through a combination of the latest generation of advanced motion control hardware and an ultra fast block processing capability, achieving speeds of 540m.min, four times faster than its predecessor control.

To find out more visit our European Technology Center email **visit@mazak.co.uk**

Yamazaki Mazak U.K. Ltd.
Badgeworth Drive,
Worcester WR4 9NF

T: +44 (0)1905 755755
F: +44 (0)1905 755542
W: www.mazakeu.co.uk
E: sales@mazak.co.uk

INTELLIGENT MACHINE

eco-friendly

ergonomics

SOUTHERN MANUFACTURING - 9-11 FEB 2016

SOUTHERN 16 Manufacturing & Electronics

FIVE | Farnborough | Hants | GU14 6XL

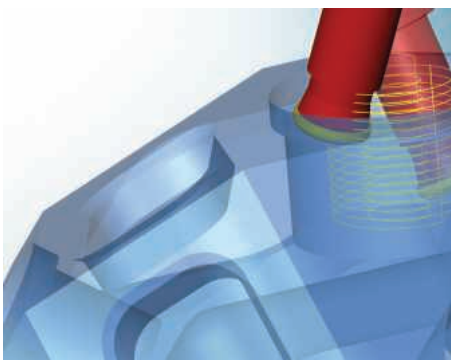
OPEN MIND 'MAXXimises' CAM performance at MACH

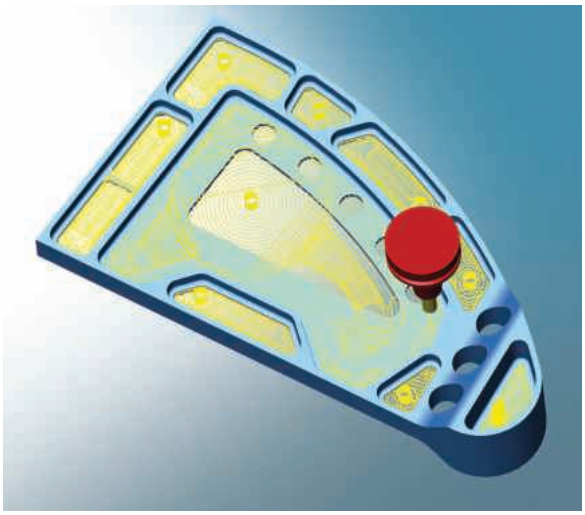
At MACH 2016, Open Mind Technologies will be giving its UK exhibition premiere to the latest version of its award winning hyperMILL® CAM software. The new hyperMILL Version 2016.2 introduces a raft of innovative new CAM strategies that will greatly improve roughing, finishing and drilling performance. One of the core highlights of the new hyperMILL suite is the 'MAXX Machining' performance package.

The new hyperMILL MAXX Machining performance package offers three powerful modules that help companies realise significant optimisation potential in roughing, finishing and drilling applications. The first module is fast roughing and this includes numerous cycles for milling in trochoidal tool paths, something that results in fast and reliable HPC machining. With a dynamic feed-rate adjustment that performs according to actual cutting conditions, customers are assured of achieving milling cycles with the highest possible feed-rates at all times. This results in optimal milling paths with maximum material removal and the shortest possible production times. High-speed roughing of both prismatic and curved component faces is supported.

Incorporating innovative algorithms, this feature ensures that a constant chip volume is always removed by each tooth of the milling tool. This delivers high utilisation rates without exposing the tool to undue stresses, resulting in roughing speeds that are 20 to 70 percent higher than before. OPEN MIND has made this fast roughing method available for all types of machining from 2D to 5X simultaneous.

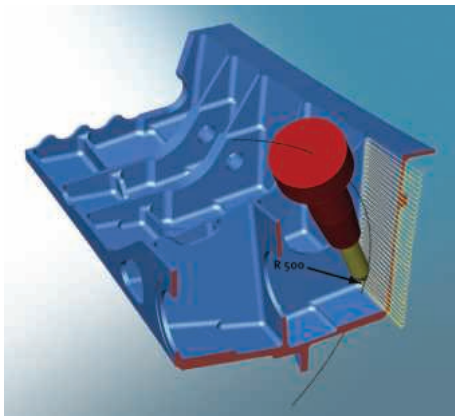
The finishing module of the hyperMILL MAXX Machining performance package has been introduced for the optimum application of tool characteristics in combination with trendsetting CAM strategies. This module includes pre-finishing and finishing of planes and free-form surfaces with various barrel cutters. Significant time savings can be achieved with a simultaneous improvement in surface quality. These benefits are accomplished with CAM strategies that use the special shape of the tools to best advantage.





The finish depends on the step-over distance and tool radius. The quality of a workpiece surface decreases as the line increment increases and improves as the tool diameter gets larger. This means that if you want to shorten the machining time by increasing the infeed rate, for example 5mm instead of 0.5mm, the tool radius has to be increased several times over to obtain a high surface quality at the same time.

As the tool diameter cannot be increased at will, barrel cutters only work with a section of the desired tool diameter – a circle segment. Larger step-over distances can be realised due to its bigger radius, while achieving high quality surface finish. The hyperMILL MAXX Machining finishing module realises fast, high-quality machining jobs with general, tangential and tapered barrel cutters.



Taking savings to another 'plane'

With 'tangent plane machining', OPEN MIND has developed a special CAM innovation for plane machining. Time savings of up to 90 percent can be achieved when using conical barrel cutters. Path distances of 6 and 8 mm are possible with the large radii of the conical barrel cutters. This results in optimal surfaces and longer tool life. 'Tangent plane machining' is equally well suited for straightforward and hard-to-reach planer faces. Tool paths are generated automatically and checked for collisions.

5-axis helical drilling

Another new performance strategy that is fresh from its world premiere at EMO is the '5-axis helical drilling' cycle. To be introduced at MACH 2016, this cycle enables holes to be machined easily and efficiently. This cycle involves helical milling with a forward lead angle. A tilt angle to the side is then used as part of collision avoidance process. The advantages are that only one tool is needed for different drill diameters. Pre-drilling is not necessary and the strategy is very well suited for materials that are hard to cut. The process features safe chip removal and reduces stress on the tool. Practical tests have shown that, with '5-axis helical drilling', the machining time can be reduced by 20 to 25 percent compared to conventional drilling.

In order to MAXXimise your machine tool productivity in 2016, visit the OPEN MIND stand for a full demo.

OPEN MIND Technologies
Tel: 01869 290003
Email: adrian.smith@openmind-tech.com
www.openmind-tech.com

MACH • Hall 5 • Stand 5965

Large-capacity, twin-pallet 5-axis HMC to make its UK debut

Following successful international launches first at Doosan's DIMF Show in South Korea in May 2015 and then at EMO Milan in October 2015, the new Doosan DHF 8000, a large-capacity horizontal machining centre with simultaneous 5-axis machining capability, will make its UK debut on Mills CNC's stand at MACH 2016.

The DHF 8000, one of 20 Doosan machines being showcased by Mills at MACH, is a high-performance, high-productivity machining centre designed to machine large, high-precision complex parts in fewer setups and reduced processing times, for the aerospace and energy sectors and others.

The Fanuc 31i- 5 controlled machine features a powerful 35kW/6000 rpm 960 N-m 'nodding-head' spindle with +60/-100 degrees' A-axis capability, a twin pallet configuration (each pallet is 800mm x 800mm in size accommodating workpieces up to 2000kg in weight), and a high-capacity automatic tool changer for up to 196 tools.

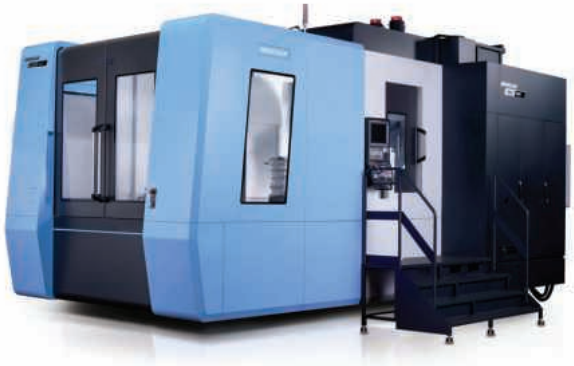
The DHF 8000 is equipped with a HSK spindle, thereby widening its appeal to aerospace component manufacturers, but can also be supplied with a BT 50 spindle if required.

The machine can handle large work-pieces (X-axis = 1450mm; Y-axis = 1200mm; Z-axis = 1500mm), and boasts 40m/min rapid rates (X- and Y-axes) and 50m/min (Z-axis).

As well as being fast and powerful, the DHF 8000 is also accurate and productive and is equipped with dual ball-screws on the Y- and Z-axes, a rigid and thermally-stable design and build, a high-efficiency chip evacuation system and a sophisticated cooling system for the machine's spindle and ball-screws.

Tony Dale, Mills CNC's technical director says "The DHF 8000 is the next generation of large high-productivity horizontal machining centres from Doosan that provides manufacturers with full simultaneous 5-axis capability.

"The machine will be showcased on our Stand at MACH machining complex aerospace-type parts in one hit, and to do this is equipped with a HSK–A100 spindle."



Mills CNC Ltd
Tel: 01926 736736
Email: sales@millscnc.co.uk
www.millscnc.co.uk

MACH • Hall 5 • Stand 5430

Vero's 2016 R2 CADCAM releases to feature at MACH

Vero will be partnering with its parent company Hexagon at MACH 2016, showcasing new and enhanced features in the 2016 R2 releases of its CAD/CAM software.

MACH coincides with the planned issue of Alphacam, Edgecam and VISI, so the show will be the first opportunity for manufacturers to see a preview of the software's second 2016 releases.

Visitors to the joint Hexagon/Vero Stand will see the very latest new features designed to improve cycle times and product quality. Each of the software's twice-yearly updates include many new aspects enabling manufacturers to take their businesses to the next level.

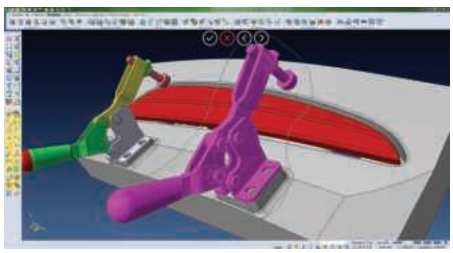
For example, Alphacam currently focuses on automation, reducing users' CADCAM time. The new Automation Manager means 2D and 3D CAD files, along with solid models from third party software, can now be batch processed, from file preparation right through to applying toolpaths, with NC code being generated automatically. In addition, the files create a full report structure, along with labels and bar coding.

EMEA sales manager Michael Pettit says: "In a standard CAD/CAM system each file would have to be processed individually by inserting the file, extracting the features, applying tool directions and toolpaths, saving the file and NC code, then generating the required reports. Alphacam takes a group, or batch, of files and automates the complete processing of the parts.

"Overall, this will save the end user days and weeks, potentially even months of programming time in a year."

Edgecam's milling, turning and wire EDM users have already benefited from over 30 important new and enhanced items of CAD and CAM functionality, with developers working on more for displaying at MACH in Edgecam 2016 R2.

User efficiency continues to be a focus for VISI, with the current release featuring an updated GUI with quick access toolbars, live icon combinations on the mouse, improved hidden line removal and geometry selection by 'free-shape' brush. In addition, CAD translators support the latest 3rd party CAD formats including Inventor 2016, layer categories for NX and attribute hole mapping for Catia V5.



Vero group marketing director Marc Freebrey says: "Developers will continue working on the software enhancements as close to MACH as they can, to ensure visitors to the Vero/Hexagon stand will see the very latest state-of-the-art updates."

Vero UK Ltd Tel: 01189 756084
Email: info@vero.co.uk www.verosoftware.com
www.alphacam.com www.edgecam.com
www.visicadcam.com

MACH • Hall 5 • Stand 5710

TaeguTec brings hole new dimension to drilling at MACH

For visitors to MACH 2016 that are looking for a 'one-stop' solution for their drilling needs, look no further than the TaeguTec stand for the answer to improving productivity, tool life and precision when creating holes.

Celebrating its centenary year, TaeguTec will be marking the occasion with its long awaited return to MACH after a 10 year absence. TaeguTec will be keen to introduce show visitors to its impressive new Drill Rush line that is currently making a huge impression in the market place.The Drill Rush is TaeguTec's marquee indexible head drilling line and is available in diameters from 6 to 25.9 mm, with most variants available in 0.1 mm increments.

Continually being developed and extended, new developments to be shown at MACH will include the new 12XD drills. Available in diameters from 12 to 22.9 mm, this exciting new twist drill with through coolant is already available with 1.5, 3, 5 and 8XD for precision hole-making. Incorporating polished flutes, through coolant and a wide chip gullet with an optimised geometry, the Drill Rush line rapidly evacuates swarf from the drill point for rigid, high performance and accurate drilling of holes.

The characteristics of the Drill Rush eliminate the need for pecking cycles, therefore further reducing cycle times. To enhance rigidity when conducting high speed drilling on everything from aluminium and non-metallic materials through to steel, iron hardened steel and high temperature alloys, the Drill Rush is offered in shank diameters of 12, 16, 20, 25 and 32 mm.

The indexable heads are available in sizes and geometries for the respective materials.

For customers drilling flat bottomed holes, TaeguTec has also introduced a line of 'flat bottom' inserts. TaeguTec realises that not all holes are through holes and, to this end, it has created the flat headed interchangeable inserts. Available in diameters from 8 to 25.5 mm in 0.5 mm increments, the flat bottomed heads are ideal for drilling and counter-boring operations, reducing cycle times and drill inventory for the customer.

This series has been complemented by TaeguTec's most recent product launch, the 'double margin' indexible heads. The R&D team at TaeguTec has also extended the scope of the phenomenal Drill Rush range with the double margin drill tips that have been designed specifically for high quality hole finishes with impeccable precision and concentricity. With two guiding margins on each of the two cutting edges, the four margins guarantee cylindricity and straightness beyond competitor product lines.

Available with TaeguTec's latest Goldrush TT9080 insert grade, the new drill heads provide surface finishes better than Ra1.6 microns. The versatility of the TT9080 grade and the geometry of the double margin drill tips enables the customer to drill anything from aluminium and copper through to steel, cast iron, hardened steels and high temperature alloys. The new double margin indexible drill heads are the ideal solution for any machine shop aiming to improve productivity and precision whilst reducing costs and required inventory levels.

Drill Rush is one of TaeguTec's latest line of drilling products, but the company will also have a complete range of drills at MACH, which will include replaceable head drills, indexable insert drills, solid carbide drills and also replaceable head drills with indexable inserts.

For further details on any of TaeguTec's extensive drilling lines or for an insight as to how TaeguTec can improve your milling and turning performance, contact:

TaeguTec UK Ltd
01937 589828
Email: info@taegutec.co.uk.
www.taegutec.com

MACH • Hall 5 • Stand 5763

'Ready-to-go' holemaking kits on offer

To introduce the marketplace to the extensive line of BIG KAISER hole-making products, the company's UK distribution agent Industrial Tooling Corporation Ltd (ITC) is now offering a 'ready-to-go' boring kit. The promotional offering from ITC is giving customers a complete box-set for producing precision holes from 17.8 mm to 152 mm diameter with a massive 50 percent discount.

BIG KAISER is regarded as a yardstick that all precision holemaking products are measured against, so this promotional offer is too good to pass up if you are a manufacturer demanding precision holes with impeccable surface finishes. The boring kit includes carefully selected accessories that permit the machining of a massive diameter range with a single boring head.

The neatly boxed kit includes an EWN boring head, two 16 mm tool holders (one solid carbide and one steel), three peripherally clamped insert holders and six centrally clamped insert holders. These heads and holders are supported with a box of 10 inserts for the tool holders, two wrenches and a coolant nozzle. The BIG KAISER boring range is renowned for being the most robust, rigid and precise system on the market. However, like all cutting tools, boring tools can only perform to the parameters of the machine tool and tool holding configuration. This is why ITC will also be giving away a FREE tool holder shank from BIG KAISER with every boring kit purchase.

ITC's managing director Peter Graves says: "As a leading cutting tool manufacturer, we are fully aware of the negative impact that poor tool holding and working practices can have on the performance of our cutting tools. Similarly, we are conscious that a tool holding setup that lacks the necessary precision, concentricity, run-out, rigidity and clamping forces can impinge upon the performance of such high precision boring products. The BIG KAISER boring tools guarantee exceptional performance and this is why we are also giving away a precision tool holder as part of the offer. The combination of a BIG KAISER tool holder and the precision

'boring-kit' will give end users precision, surface finishes and productivity levels that will genuinely affirm the importance of combining high quality tool holding with industry leading tooling or boring tools."

The offer is only available for a limited period, so contact your local ITC representative or alternatively visit the ITC stand at MACH 2016.

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

MACH • Hall 5 • Stand 5220

Metalcraft provides components for ground-breaking proton therapy units

A UK manufacturer that provides components for over 50 percent of the world's MRI scanners will be helping improve treatment choices for UK cancer patients after securing a contract to supply components for proton therapy machines at two specialist centres in the UK.
Stainless Metalcraft, based in Chatteris, Cambridgeshire will manufacture vacuum vessels and helium winding mandrels for the proton therapy units.

Proton therapy hit the headlines last year when the parents of then five-year-old Ashya King removed him from Southampton General Hospital, without doctors' permission, to seek proton therapy treatment in Spain, sparking a Europe-wide manhunt.

Metalcraft's contract is part of a £250m Government investment to bring Proton Therapy to the UK, that will see specialist centres opening at the Christie NHS Foundation Trust in Manchester and University College London Hospitals NHS Foundation Trust in 2018. Currently, UK patients needing proton therapy have to travel to the USA for treatment or other specialist centres overseas.

Austen Adams, divisional managing director of Avingtrans plc's Energy and Medical division, said: "We're delighted that Stainless Metalcraft has secured the contract and excited that our team will be playing such a key role in bringing improved treatments to thousands of UK cancer patients.

"Our team's specialist engineering skills have seen them develop a strong track-record in the medical sector: from providing components for the world's first MRI machine to technologies that allow tumours to be treated and tracked in real time and even portable MRI machines. "We're looking forward to getting started on the programme and strengthening our relationship with Varian, which produces the proton therapy units."

The components supplied by Metalcraft measure over two metres in diameter and are fabricated, welded and machined in carbon and stainless steel, requiring highly-skilled, specialist workers.

As well as high-levels of geometrical and dimensional accuracy at this large scale, the vacuum vessel needs to be vacuum tight while the helium vessels must remain pressure and vacuum tight while operating at temperatures as low as Absolute Zero (-273.15° Celsius).

Brendan Lyden, senior director Global Site Solutions for Varian Particle Therapy, said: "Developing the next generation of medical technologies is a challenging process and it's crucial that we work with partners who understand those challenges and have the specialist skills and experience to develop practical engineering solutions.

"We've worked with Stainless Metalcraft over a number of years, including on a project for the Large Hadron Collider in Cern, and have always been impressed by their knowledge, capabilities and track record bringing new ideas to life. "

Proton therapy is a highly-targeted form of radiotherapy that can treat hard-to-reach cancers, such as those at the base of the neck or spine. Unlike traditional radiation treatments that use x-rays to target the tumour, proton therapy focuses protons (positively charged particles found in the centre of every atom) into beams to kill the cancer cells. Protons stop once they reach their target, unlike x-rays which carry on through the body. This means that proton therapy is less likely to damage tissue surrounding the tumour, improving the effectiveness of the treatment and reducing unwanted side effects.

For further information visit
www.cancerresearchuk.org

Stainless Metalcraft forms part of Avingtrans PLC's energy and medical division, which offers a one-stop shop for the design, manufacture, installation and maintenance of systems for the oil and gas, nuclear, power, renewables, environmental and medical markets.

With facilities in: Chatteris, Cambridgeshire; Aldridge, West Midlands and Chengdu, China, the division specialises in the design and manufacture of pressure vessels, heat exchangers and filtration and separation components in a range of materials, from basic carbon steels through to high tensile steels, stainless steel, exotic alloys, high nickel alloys and aluminium.

The division's in-house design and process engineering team has over 250 years' combined experience, while its UK manufacturing facilities offer a heritage of nearly 170 years at the forefront of specialist vessel production.

A lower-cost facility in Chengdu, China is also dedicated to volume customers' products. Supported by a 'Safe Low Cost' philosophy, customers benefit from global value sourcing while retaining the quality controls and strategic support of the division's UK operations.

2016 marks the 100th anniversary of Stainless Metalcraft's apprenticeship scheme, which is still going strong. For further details, contact:

Stainless Metalcraft (Chatteris) Ltd
Tel: 01354 692391
Email: infoline@metalcraft.co.uk
www.metalcraft.co.uk

Just what the doctor ordered for medical device manufacturers

The Bumotec S-191 mill-turn and grinding centre, available from Starrag UK, is providing healthy gains in precision machining applications for a wide range of medical manufacturers involved in the production of both trauma aids and instruments, including surgical instruments from bar of just two mm diameter.

Enhancing the machine's worldwide recognition for small precision part manufacturing in sectors like aerospace and micro-mechanic as well as watch and jewellery, the multi-functional S-191 is also capitalising on its up-to-six-sided machining capability in a single set-up among medical companies by producing femoral balls in a single setup and machining the cobalt chrome units from

bar to a surface roughness of Ra 0.04 micron and a sphericity of 0.002 mm; machining intervertebral implants in one piece from implantable peek with no burrs, including inserting x-ray marker pins without manual intervention, reducing cycle time by 22 percent compared to a sliding head machine and producing the finished unit in 9.38 min compared to 12 min (without pin insertion); producing modular hip joints from titanium (TiAl6V4 Grade 5), and turning and milling the cone to two and four microns respectively, in the same setup compared to the previous process of using separate turning and milling machines; machining hip stem rasps from 48 mm diameter stainless steel bar in a cycle time of 1.4 hours compared to 2.30 hours on a standard vertical machining centre.

With linear drives producing rapids up to 50 m/min, the ultra-fast Bumotec S-191 has X, Y and Z axes of 400 mm by 200 mm by 410 mm and a high torque 150,000 revs/min spindle with 'shock control' technology for ultra-standard rigidity.

With water-cooled axes, spindle probing and up to 90-position (optional) tool magazine, including grinding discs up to 80 mm diameter, the machine also features auto part loading to complement the choice of parallel jaw vices, tailstock, collet system or multiple workholding units. It can accommodate bar up to 65 mm diameter.

Starrag Group is a global technology leader in manufacturing high-precision machine tools for milling, turning, boring and grinding of small, medium-sized and larger workpieces of metallic, composite and ceramic materials.

Starrag UK Ltd
Tel: 0121 359 3637
Email: paul.zajac@starrag.com
www.starrag.com

Blum delivers reliable 24 hour production for medical OEM

The requirements placed on the production of medical devices are similar to those for products from other industries, i.e. automated, high-precision and efficient. Consequently, Stryker-Leibinger in Mühlheim-Stetten, Germany relies on production measurement technology from Blum-Novotest for its machining centres for medical instruments and implants.

"The production of instruments uses several milling machines from DMG MORI, particularly the DMU 50 and DMU 60 models. Three of these systems are equipped with LaserControl Micro Compact NT laser measuring systems and TC52 touch probes from Blum-Novotest," says Simon Heyse, the milling team leader responsible for machinery procurement and equipment at Stryker. "The measuring systems enable unmanned production. Machine operators work on the milling machines during the early and later shifts, while the night shift is unmanned."

On weekends, work is unmanned around the clock, to this end the machines are equipped with workpiece storage units and handling systems that remove and insert workpieces during unmanned hours.

In order to ensure the smoothest possible unmanned operation, the machining must be monitored as if a tool breaks there is no one there to press the emergency stop button. Therefore, each tool, from the 0.5 mm ball nose cutter to the 63 mm saw blade, is measured using the laser measuring system after each machining process and prior to replacement in the tool magazine. Should the measuring system determine that the tool is broken, it is clear that the machining step was not properly completed. The workpiece is rejected and the broken tool is replaced in the next machining step by a new tool. This ensures that only one component is lost and that machining continues to run smoothly even in the event of a broken tool.

"The touch probe is used by the machine to register zero points or to check actual dimensions after machining. This enables worn cutters to be identified amongst other things," explains Simon Heyse. "With particular forceps, it may be that the blank is not correctly inserted. Then the milling cutter does not run laterally over the handle to create gripping grooves, but slams into the blank and breaks."

These special profile milling cutters can have a delivery time of up to nine weeks, which is why the Mühlhofen company would like to avoid breakages. It has therefore inserted a short measurement sequence at the beginning of the NC program, whereby the touch probe touches the forceps handle and ensures that it is correctly clamped.

The BLUM laser measuring systems were included with the DMG Mori milling machines. However, at that time, touch probes from another manufacturer were still being used for workpiece measurement. But when the Stryker NC specialists saw the BLUM TC52 at the AMB Show, they also switched to Blum products here and were surprised that it was possible to touch so quickly.

The BLUM probes can be pre-positioned at 40m/min, while the maximum speed of the old probes was 3 to 5 m/min. The actual touch movement is naturally slower, but even here, at 2 m/min, the BLUM probe is able to touch a lot quicker than its predecessor. The high positioning speed and the rapid touching shorten the measurement processes considerably. On the one hand, the machining time is significantly reduced, on the other hand an additional measurement cycle, which is inserted to make the process more reliable, does not require as much time as before.

"We no longer only use the laser measuring systems for breakage control, but also measure the cutting of shaft and T-slot cutters, drills or gear cutting tools for wear and chipping. The concentric run out of the tools and the complete form of cutters are also measured by laser," explains manufacturing engineer Jörg Hermann. "Our pre-setting device is now very rarely used, since we calibrate the tools directly in the machine. It is quick and easy and has the crucial advantage that the tools are measured under rated speed and in the real clamping situation. This enables us to offset any influences from the machine, making our machining even more precise."

Thanks to the high speeds possible with the BLUM touch probes, the measuring processes are 50-70 percent shorter.

Blum Novotest Ltd
Tel: 01283 569691
Email: david@blum-novotest.co.uk
www.blum-novotest.com

Ceramic material finds new home in medical applications

Morgan Advanced Materials, a global leader in Radio Frequency (RF) and microwave ceramic materials, has established a major application for its proven D36 microwave ceramic.

Thanks to its very specific properties, D36 is now finding a niche in medical applications where, for example, its low magnetic susceptibility makes it ideal for use in magnetic resonance imaging (MRI). Its additional qualities of very low temperature coefficient of frequency, relative permittivity, and low electrical loss, make it suitable for a range of medical applications, including microwave therapy and medical imaging. Morgan can supply D36 components in custom shapes and, if required, with a thick film silver coating.

For these reasons, Morgan was chosen by Emblation Ltd to support development of the world's first microwave treatment system in the field of podiatry and dermatology, designed for use on soft tissue lesions.

For Chris Davenport of Morgan Advanced Materials, the suitability of D36 for medical applications, with their highly demanding specifications, is no surprise:

"Morgan has a wealth of experience and expertise in the production of RF and microwave ceramic components for a variety of applications and has invested in extensive, cutting-edge design, development and production capabilities.

"This makes us the ideal partner for the development of enabling components for medical devices and equipment, from inception to production," he explains.

To find out more about the materials and services offered by Morgan Advanced Materials, visit **www.morgantechnicalceramics.com/D36**

Morgan Advanced Materials is a global materials engineering company which designs and manufactures a wide range of high specification products with extraordinary properties, across multiple sectors and geographies.

From an extensive range of advanced materials, it produces components, assemblies and systems that deliver significantly enhanced performance for

customers' products and processes. Engineered solutions are produced to very high tolerances and many are designed for use in extreme environments.

The company thrives on breakthrough innovation. Its materials scientists and applications engineers work in close collaboration with customers to create outstanding, highly differentiated products that perform more efficiently, more reliably and for longer.

Morgan Advanced Materials
Tel: 01299 827000
Email: marketing@morganplc.com
www.morganplc.com

Four new 5-axis machines from Mazak at EMO 2015

Yamazaki Mazak presented four brand new 5-axis machines at EMO 2015.

Taking centre stage and making its world debut, the VARIAXIS i-1050T represents the latest and largest addition to Mazak's highly successful VARIAXIS range of 5-axis machining centres. The i-1050T has full turning capability and uses the world's fastest CNC, MAZATROL SmoothX.

The VARIAXIS i-1050T features a gantry box design with a fully cast structure to ensure maximum stability and accuracy, ideal for machining large workpieces up to dia. 1,250 mm x 900 mm, with a maximum weight of 2,000 Kg.

Performance is delivered with a powerful 10,000 rpm and 37 kW 50 taper spindle, capable of machining a wide range of applications. The machine is also equipped with a high rigidity turning table which utilises a 500 rpm direct drive motor, integrated inside a fully supported trunnion table for maximum stability.

This combination of spindle power and rigidity makes the VARIAXIS ideal for complete done-in-one processing of complex, large and heavy duty workpieces that also require turning, such as those commonly used in the aerospace sector. Additionally, the milling spindle can be optionally specified, with a high torque 5,000 rpm spindle for difficult to cut materials and a high speed 15,000 rpm spindle for high speed machining requirements.

The VARIAXIS i-700, also debuted at EMO 2015 with the new SmoothX CNC provides full 5-axis simultaneous machining capability for a complete done-in-one solution when working with complex workpieces up to dia. 730 mm x 500 mm.

It is equipped with a versatile 18,000 rpm spindle combining both high speed and power via a 35 kW motor, making it suitable for a wide range of applications and the most demanding of materials. High accuracy machining and thermal stability are ensured by an integrated cooled spindle, core cooled ballscrews and an Intelligent Thermal Shield function.

The class-leading 1,100 mm Y-axis stoke increases accuracy and reduces non-cutting time by eliminating A-axis table movement during tool changes. The VARIAXIS i-700 is part of Mazak's highly acclaimed PALLETCH system, offering an automated solution for flexible unmanned production of 5-axis

components. Another VARIAXIS model, that made its world debut at EMO, is the VARIAXIS j-500, which is equipped with the new SmoothG control. With its done-in-one capability the VARAIXIS j-500 offers a high performance cost-effective solution for machining 5-axis multi-surface components up to dia. 500 mm. The high rigidity fully cast structure delivers outstanding machining results without compromising performance or accuracy, thanks to its robust 12,000 rpm and 11 kW spindle, linear roller guides on all linear axes and a fully supported trunnion table, incorporating roller gear cam on both A and C axes.

The fourth 5-axis, which debuted in the 5-axis zone, is the VORTEX i-800V/8S fitted with Mazak's revolutionary touch screen SmoothX CNC. The machine's tilting spindle allows for the 5-axis simultaneous machining of complex contours on large parts, such as jet engine casings, airframe components and gearboxes, made from titanium, aluminum and steel. The new variant of the VORTEX i-800V/8 series offers customers the choice of a single pallet configuration to complement the existing two-pallet design, providing excellent all round access to the working area with a large machining envelope capable of machining workpieces of dia. 1,700 mm x 1,600 mm.

VORTEX i-800V/8S was also showcased and comes with a high speed 15,000 rpm and 56 kW spindle for high speed applications, such as medium sized structural aerospace components. The machine is suited to a variety of machining applications, with a choice of high power

spindles capable of 10,000 rpm and 37 kW and high torque 5,000 rpm milling spindle completing the impressive lineup. With the VORTEX's ability to reduce machining time, the agile performance is complemented by high speed rapid traverse rates of 52m/min on all linear axes minimising non-cutting time.

For customers established with Siemens, the VARIAXIS i-500 with SINUMERIK 840D sl complements the impressive lineup of VARIAXIS on show. With its class leading 18,000 rpm and 37.5 kW spindle performance, allied to a 4.5 second chip-to-chip tool change and MDynamics technology package, the VARIAXIS i-500 offers outstanding performance for 5-axis components up dia. 500 mm.

Yamazaki Mazak UK Ltd
Tel: 01905 755755
Email: sales@mazak.co.uk
www.mazakeu.co.uk

MILLS CNC

www.millscnc.co.uk

01926 736736

Our new Doosan productivity game-changing VCF 850 5AX (5-axis) machining centre has been classified PG. See it on our stand at MACH 2016.

PG

Productivity Game-changer!

MACH 2016
11-15 April
NEC • Birmingham UK
machexhibition.com
Hall 5 Stand 5430

The new, large-capacity VCF 850 5AX is a 5-axis machine with a 3 metre long machining area; a built-in 12,000rpm spindle with Heidenhain control; a +/- 110° tilting B-axis and a choice of embedded (800mm diameter) or top-mounted (500mm diameter) rotary table.

DOOSAN

If you're looking for a 5-axis machine that's a real and proven Productivity Game-changer...check-out the VCF 850 5AX on our stand.

Aerospace subcontractor expands with 5-axis machines

As a subcontract manufacturer, Birmingham based Larkshill Engineering has just invested in a 5-axis Correa machining centre from DTS to increase its customer base in the aerospace, nuclear, oil and gas and mould and die sectors.

Established for over 25 years, Larkshill has grown to become a specialist in precision manufacturing across a diverse range of industries and applications. Its principle product range includes special purpose machines, jigs, fixture, press tools, moulds and gauges for application across a wide spectrum of engineering requirements. So, a new machine tool was required to meet its growth ambitions.

Commenting on the acquisition of the DTS machine, Gary Murphy, project manager at Larkshill Engineering says: "We have always remained responsive to our customers needs and this involves creating flexible capacity levels on our CNC machining, turning, grinding and EDM machines to deliver what the customer wants. By meeting customer demands, we are expanding to add new capacity and complement our existing capabilities as our customers require a one-stop-shop solution, and we are aiming to tick all the boxes."

"The addition of the Correa gives us flexibility as it allows us to do intricate, complex and precision components but also heavy duty parts. There genuinely aren't many machines that can tick both boxes in that regard. It also allows us to improve lead-times whilst reducing our costs. "

Neil Harrison, production manager at Larkshill Engineering says: "The machine has an unusual layout of the travelling column. This enables the Y-axis to move back really far and enables us to put really large parts on the machine. Furthermore, the table will take seven tonne in weight, so it gives us some really great capacity, flexibility and also the ability to load very heavy and large parts. "

"Added to this, it's such a strong, historic and well recognised brand that is built on a well proven design. We know that the machine will last the distance rather than buy a machine that will last five years and die! It also gives us incredible accuracy with 0.02 mm resolution on the milling head that is really robust with dual Hirth couplings that gives us exceptional strength. We machine a lot of aerospace grade materials and we need precision, repeatability and rigidity that will permit heavy duty cutting. The Correa gives us that."

"The machine is a new concept for us and definitely a learning curve. However, the learning curve has been all about learning how much more we can actually get out of the machine than we expected."

Asked about the plans for the future of the business, Gary Murphy concludes: "In the future you could expect to see a few more Correa machines. We are expanding our scope in respect to Tier 1 customers and we have to fill our new facility to meet these ambitions. This will enable us to achieve our targets in the nuclear, oil and gas and automotive sectors in addition to our existing aerospace work."

ProDesign 5-axis vertical machining centres

Now available from DTS is the new line of ProDesign 5-axis vertical machining centres for high speed and highly productive machining of complex components. The new LU-620 is an advanced, multi-tasking VMC that has been designed to produce complicated parts at high speed.

With its innovative 5-axis configuration, complex machining can be accomplished in one setup to dramatically reduce machining time whilst enabling the end user to stay ahead of the competition. The new ProDesign LU-620 provides a compact X, Y and Z-axis travel of 620 by 520 by 460 mm respectively for small to medium components with a B-axis tilting range of 50-110 degrees. Additionally, the C-axis rotating range provides 360 degrees for full 5-axis machining that is efficient and fast.

The powerful spindle has a direct drive transmission that delivers a high level of torque throughout the full range with a maximum spindle speed of 12,000 rpm. The spindle tool holder provides a BT40 configuration for large tools to maximise material removal rates. This spindle is fed cutting tools by a 32 tool change carousel.

DTS UK Ltd
Tel: 0844 4457005
Email: sales@dtsuk.co.uk
www.dtsuk.co.uk

VMX42SRTi **HURCO** VMX60SRTi

MORE CAPACITY THAN A TRUNNION MACHINE

- Innovative design gives the most versatile configuration for a 5 axis machine
- Full capacity use of the machine table when in 3 axis mode
- 600mm diameter, 500Kg capacity, direct-drive rotary C axis
- Parts can also be machined horizontally, allowing far greater height clearance, compared to a trunnion
- Unlike a trunnion machine, component size is not limited by the table diameter

CALL 01494 442222 NOW FOR MORE DETAILS

MACHINING CENTRES | TURNING CENTRES | 5 AXIS | DOUBLE COLUMN | SUPERIOR CONTROLS





HURCO EUROPE

Halifax Road • Cressex Business Park • High Wycombe HP12 3SN
Tel: (01494) 442222 • Fax: (01494) 443350
sales@hurco.co.uk • service@hurco.co.uk • www.hurco.co.uk

Fewer operations and improved accuracy with latest 5-axis cell

Automated, high-speed milling cuts Irish toolmaker's lead-times by up to 20 percent

A lot of electric discharge machining previously carried out by Galway Tool & Mould (GTM) has been replaced by high-speed cutting at up to 42,000 rpm on three German-built Roeders machining centres supplied by Hurco Europe, High Wycombe, through its local sales representative in Ireland, Michael Gannon.

Two of the machines, which are all installed in a temperature controlled environment, have been automated with pallet changers so that they can be operated around the clock, unmanned at night.

GTM's owner and managing director, Padraig McFadden, says: "As a result of this and other measures, mould lead-times have been cut by up to 20 percent to typically 14 weeks and we have increased productivity significantly."

The main specialism of the company, which was founded in 1990, is the manufacture of high precision injection moulds for the medical, pharmaceutical and high-volume packaging sectors worldwide, from single-impression moulds for prototyping to 48-cavity moulds for producing complex plastic devices such as inhalers.

In addition, a small number of micro moulds is produced to make, for example, miniature rotor gears and screws for medical assemblies or for overmoulding stents. Components down to 10 milligrams can be moulded to tolerances of ± 0.005 mm, consistently and reliably.

The successful working practices implemented by GTM at its Galway factory resulted in a doubling of turnover between 2012 and 2015 and an increase in floor area from 4,000 to 15,000 sq ft, with an extension of an additional 8,000 sq ft currently being added. There are now 30 employees of whom three are apprentices.

Migration from EDM to high-speed milling is one factor in that success, but others are the opening of a metrology laboratory for tool validation and an in-house trial facility for moulds equipped with Fanuc electric moulding machines ranging from 100 to 300 tons capacity. Padraig McFadden emphasised that customers get a perfect turnkey mould every time, which has been designed, manufactured and tested for process viability, including correct shrinkage allowance.

2007 was a year of change for GTM, which until then derived a large proportion of turnover from automotive mould making. Much of this work rapidly disappeared overseas, notably to China, so Padraig McFadden diversified into other areas, particularly the medical industry for which Ireland had become a global manufacturing centre. Characteristic of medical mould work are the requirement for tighter tolerances and better surface finishes as well as shorter lead-times than are normal in the automotive sector.

GTM was sparking a lot of small parts for moulds, but electrode manufacture is time-consuming and EDM is itself a slow process. The decision was taken to replace as much EDM as possible with high-speed machining using small-diameter, ball nose milling cutters. It was a move that would save 70 percent of the time needed for this part of the manufacturing process, according to shop floor manager, Mark Walsh. Every mould that passes through the Galway factory now undergoes some high-speed cutting on one of the Roeders.

Mark Walsh says: "Back in 2007 we asked several potential HSC machine suppliers to make test cuts on one of our moulds. The Roeders machine beat all the others in terms of speed, accuracy and surface finish.

"It was noticeably better in all areas, partly because the German machine builder was an early adopter of linear motors for the axis drives.

"Coupled with glass scale feedback to the control and compensation for spindle growth via a high precision sensor, it allows us to hold ± 2 µm accuracy.

"This was three times better than on a ballscrew-driven machine we trialled, which also had the drawback of not being able to achieve the surface finish we require for our moulds."

He adds that an on-line search revealed Roeders' reputation for machine reliability, high spindle uptime and good service, so in

the end the purchase decision was straightforward. A Roeders RXP500 3-axis VMC with a 40-tool magazine was duly installed. Despite it having run 24/5 plus extensively at weekends for more than eight years, Mark Walsh confirmed that the machine is just as good today in terms of the accuracies and surface finishes achieved as when it was new.

This level of performance led automatically to the purchase of a second Roeders 3-axis RXP 500 in 2013 to cope with raised production levels. Automation was fitted in the form of an automatic, 8-pallet changer that allows any mix of jobs to be set up and run unattended overnight, or over an entire weekend if longer-running jobs are selected.

During the day, both RXP500s can be attended by one person due to the automation fitted to the second machine. Mark Walsh was palpably enthusiastic when he spoke of how many more hours

they were getting out of the spindles for the same number of operator hours.

One-hit 5-axis machining slashes production time by 75 percent

More recently, work has been more heavily centred on pharmaceutical moulds, entailing machining of even greater complexity that requires multiple setups on a 3-axis machine, the use of long cutters to access awkward areas from above, and repeated repositioning for side features to be included.

A 5-axis VMC was the obvious solution, so in May 2015 a Roeders RXP601 DSH with a 96-tool magazine was installed, again with automation but this time provided by a 38-position pallet change system to allow longer periods of unattended running. A second RXP601 could be served by the same automation equipment if required in the future.

The advantage of using 5-axis machining on some jobs is dramatic. Take the aforementioned inhaler mould, which was previously machined in a total of eight hours on a 3-axis Roeders and an EDM machine in five operations. They comprised milling with an 80 mm long, 16 mm diameter cutter that was slowed to 3,000 rpm to avoid undue vibration, followed by a setup on either side for further milling, then sparking on four sides and around the skirt. The 5-axis HSC machine tackles the same job in a single setup in one-quarter of the time, just two hours complete.

Hurco Europe Ltd
Tel: 01494 442222.
Email: sales@hurco.co.uk
www.hurco.co.uk

Workholding provides multi-pallet, multi-axis, solution

When Wellingborough-based R&G Precision took its first steps into full 5-axis machining with an investment in a Matsuura MAM 72-35V, it turned to WNT (UK) to provide the workholding solution for the machine's 32 pallets.

R&G Precision Engineering is one of those classic success stories, beginning life with two friends Vic Rigalsford and Giuseppe (Joe) Giammasi setting up the business in 1974, literally two men in a shed working evenings after doing their 'day job', taking on any and all work that was sent to them. When Vic retired from the business in 1983, Joe continued to develop the business, relocating several times, including working from a pigsty, which had to be cleaned before they could move in! More conventional premises were later purchased before the business settled in its current location occupying an 18,000 ft² facility in Wellingborough, from where it provides precision machining, spark erosion, grinding and assembly to a broad spectrum of customers from the motorsport, medical, oil & gas, defence, telecomms and aerospace sectors.

"We have experienced steady growth throughout the businesses existance, but we literally started with one manual lathe and I was delegated to be the salesman by Vic," says Joe Giammasi, chairman, R&G Precision Engineering. "The biggest influence on our business was when we purchased our first CNC machine almost 24 years ago, that led to further expansion and brought us to where we are now machining components for some prestigious customers across a wide varaiety of industrial sectors."

As this growth continued R&G Precision Engineering had to look at alternative manufacturing solutions and this led to the purchase of its first full 5-axis machine. "The benefits of the multi-pallet Matsuura were plain to see as the type of work we were doing would allow for long periods of unmanned machining, with typical cycle times of an hour and, with 32 pallets we could throw lots of work at it and let it get on with it. Our initial problem, though was workholding," says Phil Parish, RG Precision Engineering's head of programming and engineering. "It was then that Warren from WNT arrived and left one of their ZSG vices with me to 'play with'. I was like a kid in a sweetshop as, along with the physical vice, WNT also provides detailed CAD models for all its products so I was able to visualise lots of different workholding scenarios."

The result is that all 32 pallets on the Matsuura are now equipped with the WNT MNG Zero Point clamping system and WNT ZSG-4 centric vices. The ZSG-4 is a mechanical centric-type vice that benefits from high clamping forces, up to 35 kN with a gripping range of between zero and 300 mm, yet they remain very compact, making them ideal for high-end, multi-pallet, 5-axis machines such as the Matsuura at R&G Precision Engineering. The precise engineering that goes into each vice ensures maximum accuracy and repeatability of +/-0.01 mm. With up to 12 variants of the ZSG-4 vice available there is one for every application and when combined with the MNG Zero Point baseplate they can be mounted singley or, as double vices for further versatility. A further advantage is that they are compatible with existing baseplate systems and zero point adapter plate from other manufacturers. Location of the vices is kept straightforward, making use of a single pull stud and two

dowel locations, making it easy to reposition the vice if required.

Warren Howard, WNT (UK), technical sales engineer says: "We are finding that we are being asked more and more to put together applications based packages for our workholding systems and we are winning business due to certain distinct advantages that the ZSG-4 system has to offer, especially for 5-axis applications, where the compact design of the vice allows much greater access to the part. Other key features are the use of an encapsulated, pre-tensioned, leadscrew that aids swarf clearance and avoids the risk of clamping on trapped swarf, rather than the component. Also, the ZSG range has a much wider choice of jaws than other systems, including pendulum and adapter jaws that can grip circular and unusual shaped components easily, smooth or serrated jaws, stepped jaws, carbide coated jaws or soft jaws that can be machined to suit specific components. A key feature, though, is the ability to apply maximum gripping pressure, holding on just 3 mm of material, without any requirement to pre-prepare the material."

In addition to clamping components directly into the ZSG-4 vices R&G Precision Engineering also uses them and the MNG Zero Point baseplates to locate fixtures, adding even greater versatility to its machine capacity. The compact nature, and ease of access to the component also caught the attention of the quality control department, which has now invested in its own WNT ZSG-4 vice that sits on the corner of the CMM table allowing the same access to parts as on the Matsuura. This has improved the flow of work through that department and aided statistical analysis procedures.

"We quickly realised that with the mix of work that we are putting through the Matsuura machine that vices, and in particular, the WNT ZSG-4 vice along with the MNG Zero point baseplate was the only way to go. It is proving to be quick, efficient easy to use and setups are straightforward thanks to the CAD models that WNT provides. With the baseplate setup that we are using the height of the vice from the base of the pallet is perfect, allowing maximum access to five sides of the component," Phil Parish concludes.

WNT (UK) Ltd
Tel: 0800 073 2 073
Email: tony.pennington@wnt.com
www.wnt.com

Table topping 5-axis performance

GF Machining Solutions, the EDM, milling and laser ablation machine tool specialist and automation and tooling system solutions' provider has added a new, compact and versatile range of 5-axis machining centres to its product line-up.

The HEM 700U machines available as either 3 + 2 or full 5-axis simultaneous models have X-, Y- and Z-axis travels of 700 mm x 600 mm x 500 mm respectively with all axes featuring stable linear guides with high load bearing capacity for improved and reliable performance.

The machines, aimed at the aerospace, automotive, medical and general precision component manufacturing sectors, provides users with high-performance, high-value 5-axis machining capability (3 + 2 and/or 5-axis simultaneous), and are suitable for machining prototypes and one-offs through to small-to-medium batch production.

The HEM 700U machines are equipped with a powerful 20 kW 12,000 rpm ISO/BT 40 inline spindles (36 kW 60,000 rpm/HSK – A63 motor spindle option), and rigidly-designed and supported spindle housings enable the machines to be used for demanding milling and drilling operations and applications. A closed internal cooling circuit stabilises spindle temperature and reduces temperature-related drift.

The machines feature a 30-position drum-type ATC that boasts a two-second chip-to-chip changeover time which helps improve productivity. (The machines can also be supplied with a 60-position chain-type tool changer if required).

The machines' 5-axis capabilities are delivered by a rigidly-designed and constructed 630 mm diameter rotary/tilting trunnion-supported table delivering +65/-110° B-axis tilt and n x 360° C-axis rotation.

Depending on customer requirements HEM 700U machines can be supplied with a fixed table or with 5- or 7- station automatic pallet change capability and their productivity potential can also be increased with the integration of external robot/work-handling systems.

The machines can be equipped with either the Heidenhain iTNC 530 HSCI FS or Fanuc 0i-MD control and are supplied with a range of SMART technology modules (e.g. Remote Notification System: Intelligent Thermal Control etc.), for improved performance, reliability and efficiency.

GF Machining Solutions Ltd
Tel: 02476 538666
Email: info.gfms.uk@georgfischer.com
www.gfms.com/uk

XYZ lathe fills gap left by £½ million turning centre

For fans of what is perceived as the UK's favourite chocolate selection the quality work undertaken by Crabtree of Gateshead will be right up your street. Established over 100 years ago Crabtree is a world leader in the design and manufacture of metal decoration presses, or in layman's terms printing presses for metal objects, such as food containers and tins of chocolates.

Crabtree has maintained its status as a world leader through constant product development and its latest FastReady Gen 3 Premium presses are testimony to that. With a capability of printing six colours, these multi-million pound machines are able to print up to 7200 metal sheets, measuring 1200 mm by 1000 mm, per hour. The big advantage being the speed at which the press can be changed from one product to another, the FastReady Gen 3 modular design allowing it to lay claim to being the world's quickest when it comes to changeover times between print runs.

In addition to manufacturing complete systems, Crabtree also has a strong market for spares for the many hundreds of machines it has sold over the years. These spares, along with the majority of parts for new build machines are produced in-house, maintaining that prestigious 'Made in Britain' element that the company, which exports to 90 countries, feels is vitally important. "We take added value to its extreme here," says Neil Graham, Crabtree's machine shop supervisor. "We take raw steel and cast iron and turn it into multi-million pound end products and to achieve that we have been investing in new machine tools on a regular basis since the management buyout of the business in 2001."

Part of the investment process sees older machines being replaced and a case in point is the recent arrival of an XYZ SLX 555 ProTURN lathe with a three metre bed. This machine is being used to take up machining capacity left when Crabtree disposed of a 20 year-old turning centre, that when new cost £500,000. "We recognised that the turning centre wasn't being used to its full capacity, it needed highly skilled people to program and operate it, so we looked around for an alternative that could provide straight-forward turning capacity capable of handling the wide variety of components that we produce, that range from intricate shafts measuring a few millimetres in

Above and Below: The XYZ SLX 555 ProTURN lathe is used on a wide variety of components from gears to large rollers, replacing capacity left after a high value turning centre was removed

diameter to printing rolls that could be a couple of metres long and 500 mm diameter or more," says Neil Graham. "We did wonder if a machine priced at £55,000 could replace the expensive machine we had, but from day one the XYZ has performed perfectly achieving the tolerances that we need, down to nine microns on some bores without fuss. The work we are asking it to do is well within its capabilities and the XYZ SLX 555 just gets on with whatever we throw at it, doing what it does really well."

A key point with the XYZ SLX 555 ProTURN lathe for Crabtree was the ProtoTRAK control system. Like many companies they struggle to find highly skilled people and the ease of use of the ProtoTRAK system has already proved invaluable when the original operator decided to leave the company. His replacement had just one day's training at XYZ's northern showroom, then spent a week shadowing the original operator before he left. After such limited experience of the ProtoTRAK he was 'flying solo' programming the machine. "In our experience if we had encountered the same situation with the turning centre the minimum training period would have been three months, even then supervision would have been required, so the ProtoTRAK has been a breath of fresh air," says Neil Graham.

The XYZ SLX 555 ProTURN is the largest ProtoTRAK controlled lathe in the XYZ range and features a 3 m between centre length with a 2.9 m maximum turn length, the swing over the bed is 560 mm and the 11 Kw (15hp) spindle has a 30 – 1800 revs/min capability over two ranges. Supporting all this is a one-piece solid, ribbed, cast base, with a 500 mm wide bed width that creates a substantial and rigid machining platform.

Crabtree of Gateshead has an inventory of over 30,000 parts that customers can call on for spares, so a reliable manufacturing environment and control over that process is vital to their efficient running of the business. So the performance of the service and support of its machine tool suppliers is paramount. "In that regard XYZ scored highly from day one, with the XYZ SLX 555 being delivered on time and within a couple of hours of it being offloaded from the wagon it had been commissioned and was cutting metal. In terms of after sales service there has been no call for support as the machine has operated faultlessly. The XYZ machine is proving to be excellent value for money for Crabtree of Gateshead and the ProtoTRAK control is perfect for the mix of low volume work that they are asking the machine to produce."

A four position Crabtree Fastready GEN3 printing press

XYZ Machine Tools
Tel: 01823 674200
Email: nigel.atherton@xyzmachinetools.com
www.xyzmachinetools.com

Citizen is a key element in Truturn's expansion plans

Anne Johnstrup, company chairman and Yvonne Hammond, finance director are not engineers. However, these two ladies have created and motivated, with the help of operations manager Bob Wilkins, a team of 33 people in a very successful subcontract production company that has invested almost £1 million in the last few years to help expand its expertise in single cycle, turn-milling technology.

Indeed, for Truturn Precision Engineering (Charfield) (TPE), now celebrating 30 years in the subcontract business, key in the investment programme included the addition of a further two Citizen Cincom CNC turn-mill centres. With the new machines TPE has been able to create a separate sliding head machine shop that now comprises six Citizen machines following progressive installations since 2002.

With the original move into CNC with Citizen, to replace traditional cam-auto machines, Anne Johnstrup reflects the immediate change to flexibility and productivity for the Stroud-based business. "We especially noticed the transformation in the working environment being able to escape from excessive machine shop noise and the lack of the smell associated with oil misting. The change to Citizen certainly helped to set us on the road to embrace technology for our future."

Anne Johnstrup continues: "Subcontract manufacture is a very competitive, small margin business area that demands constant control, the maximisation of skill and focus to maintain a return on any investment. Yvonne, Bob and I are very keen to secure our future and not let the business drift or sit on its laurels of a good order book." She believes a major part of her team's management role is to look and listen, debate, then if viable, move forward and carry-out whatever will aid or create a return.

"We have to constantly look for ways to enhance customer loyalty which is where investment, such as in the Citizen machines can help. But also, we have to prepare to spread risk where economically possible by seeking other sectors so we can expand using our skills and expertise,"

A prime example of TPE's progressive development is the build up from 1.5 percent of sales to max-out at 22 percent of turnover over a period of seven years in the production of highly complex Hastelloy nickel-based material components destined to mainland Europe and the Far East.

Amongst her current plans, using the additional more advanced production capability and capacity is expansion into the nuclear sector having also recently qualified 'Fit for Nuclear' (F4N) business excellence through the Nuclear Advanced Manufacturing Research Centre. Also, on the agenda, is to expand on the firm's current success in supplying to medical and veterinary services.

These new targets are in addition to the current core customer base that creates over a third of turnover through exports which even includes China covering sectors as diverse as oil and gas, defence, aerospace, automotive, agricultural, food and marine where TPE provides sub-assemblies, electro-mechanical assemblies, fabrications and precision turned and machining centre based component supply.

The most recent installation of the fourth generation 4-axis Citizen Cincom B16E-VI is used for turn-milling cycles to produce components from 0.5 mm diameter with cycle times that range between just 10 secs and nine minutes. The machine has a 10,000 revs/min main and 6,000 revs/min sub-spindle and a 16 tool capacity. Of these positions, five tools are mounted on a yoke around the main spindle which minimises any lost time to positioning and through the rigidity created by their location close to the main spindle, this helps in maintaining repeatability for size and surface finish.

Ryan Woodward, recently promoted due to his ability and enthusiasm to the position of Citizen team leader, explains: "Through a Y-axis, flexibility is enhanced and tool centre-height is very practical and quick to set." In addition he has found, with three 0.5 kW, 4,500 revs/min driven tools available for cross-machining and four tool positions, each for front and back machining, there is ample choice to create an economic setup.

Bringing totally new orders of production capability through its heavier build and greater rigidity for machining work from bar up to 32 mm diameter, the recently installed 7-axis Citizen Cincom A32A-VIIPL machine not only has the advantage of class-topping 45 m/min rapid traverse but also the flexibility from 23 tool positions. Used for work between 5 mm and 32 mm diameter, six tools are available for turning, four are driven by 1 kW, 5,000 revs/min for

cross-machining and nine for back machining with the 2.2 kW 5,000 revs/min sub-spindle. There are also four tools for application with the 5.5 kW, 8,000 revs/min main spindle.

Ryan Woodward says: "This machine has proven to be especially beneficial when compared against two older 32 mm capacity Citizens. While all the machines are easily capable in holding general tolerances of 0.05 mm, the new machine certainly stands out. We get much faster cycle times and can hold size that is especially important on some special parts, such as when 0.008 mm tolerances are called for. The rigidity of the machine is also well-proven when working on difficult materials such as Hastelloy, titanium and some of the more difficult stainless steels".

Ryan Woodward explains he is also responsible for one Citizen Cincom L20-VII that runs 24-7 on a family of four parts. "Although this machine is quite old, it just runs and runs", he said. But most batches on the other five machines are between 50 and 2,000 parts and quite often, can be changed over up to three times in a day. To this Anne Johnstrup comments how Ryan Woodward has taken to the new machines

and has proven to be getting the very best from his setups. "When we run repeat batches using mostly a standard suite of tools, changeovers can be as quick as just five minutes. However, this can extend to around four hours for very complex new parts involving elements such as off-centre machining, wobble broaching and lots of milling. We also use Citizen's Alkart CNC Wizard to assist our programming as well as working direct at the control."

Anne Johnstrup refers back to the decision to buy Citizens: "We need reliability and consistency of production because we run unmanned through the night in order to maximise utilisation and have found even the oldest machines, although slower than the current models, can still be highly productive."

Citizen Machinery UK Ltd
Tel: 01923 691500
Email: gbryant@citizenmachinery.co.uk
www.citizenmachinery.co.uk

Onwards and upwards at Baker Engineering

Situated in the heartland of aero engine, railway and power generation manufacturing, Derby-based Baker Engineering Limited is a subcontractor that has found great success since founder Adrian Baker established the company eight years ago.

Now employing eight skilled personnel, he recently made a major investment in the business' future with the purchase of a Quaser MV184P vertical machining centre, an addition that has enabled the business to move to a new level in terms of precision, productivity and capability.

He says his operation is more akin to a tool room environment: "We do an awful lot of one off and bespoke projects so we have to be very adaptable; an attitude that reflects our machine purchase policy. "Mould tools and fixturing predominate but the operations' capabilities extend to aerospace and rail car components for nearby major suppliers."

The compact MV 184P is proving itself to be a highly adept machine across a range of disciplines. It was specified with a Fanuc 31i control to suit Baker's style of work.

"We programme off line and mostly work from customer solid models or step files so needed the processing speed in preference to the memory that other controls offer," explains Adrian Baker. "Fanuc is also the system our operators are used to on other machines so it made sense."

The MV 184P offers a high specification and is supplied with Quaser's unique grease replenishment system fitted as standard. This particular machine has a BBT40, 48 tool capacity ATC and is equipped with 15,000 rpm spindle, a seven point thermal management system, a generous 1200 x 600 work table and 20 bar through coolant at the spindle. The machine also has linear slides and scales as standard.

"I likened our operation to that of a toolroom and the Quaser feels very much like a toolroom machine with its build quality. It came pretty much ready to go and we were in full production within a couple of days," recalls Adrian Baker.

"It was a great leap forward for us and the 610 mm Y-axis is a big feature. We have a metre capacity on another machine so can accommodate some decent size workpieces across the two if required.

"Machine power was also important with its 22 kW motor. Workpiece materials vary greatly from aluminium to stainless, titanium's and nimonics so we need the on-board capability," he adds.

Engineering Technology Group
Tel: 01926 818416
Email: djames@engtechgroup.com
www.engtechgroup.com

Machining centres for jewellery manufacture

An ingenious method for automating the setting of gemstones has been developed using a Brother 30-taper, vertical machining centre, which can naturally also carry out high-precision milling of gold, silver and other precious metals. The Japanese machine builder's sole UK agent, Whitehouse Machine Tools, describes the metalforming process.

Traditionally, the metal that holds a gem in place is formed manually over the crown of the stone to create the setting. When only one or a few stones are secured, in a ring for example, this is still the easiest way. However, a clasp for an expensive handbag can easily hold a matrix of 250 diamonds over a flat surface. In this case, considerable time savings can result from automating their setting.

It has been found that a Brother vertical-spindle machining centre can be used to set the gemstones in a CNC cycle. The metalforming technique involves slowly rotating a steel tool with a hollow dimple at the tip, slightly larger than the gem, and programming it to visit each stone consecutively and press the metal over the crown to create a rim setting.

Alternatively, to produce a pavé setting that looks like a continuous surface of many closely-spaced diamonds, a similar but smaller diameter tool bends the metal into beads around each stone to hold it in place.

In both cases, the time for completing the setting cycle is a fraction of that needed to do the job manually, so the customer receives the item in a shorter lead-time. Repeatability is better than is possible to achieve by hand, resulting in even higher quality products. If a twin-pallet, 3-axis Brother TC-31A is used for this purpose, four clasps may be fixtured on the two pallets and set with diamonds unattended overnight.

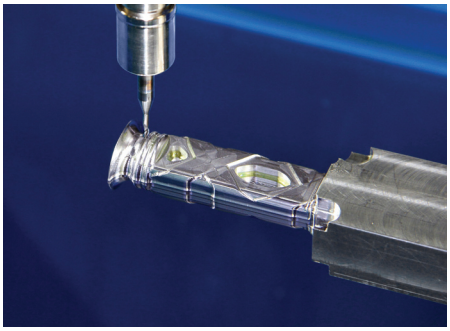
If engraving on a curved surface is required, production can be transferred to a Brother machine with a 4th axis rotary indexer. A 60,000 rpm air turbine may be deployed in place of the Brother spindle to raise productivity, but for most jobs the TC-31A's 22,000 rpm spindle is sufficiently fast.

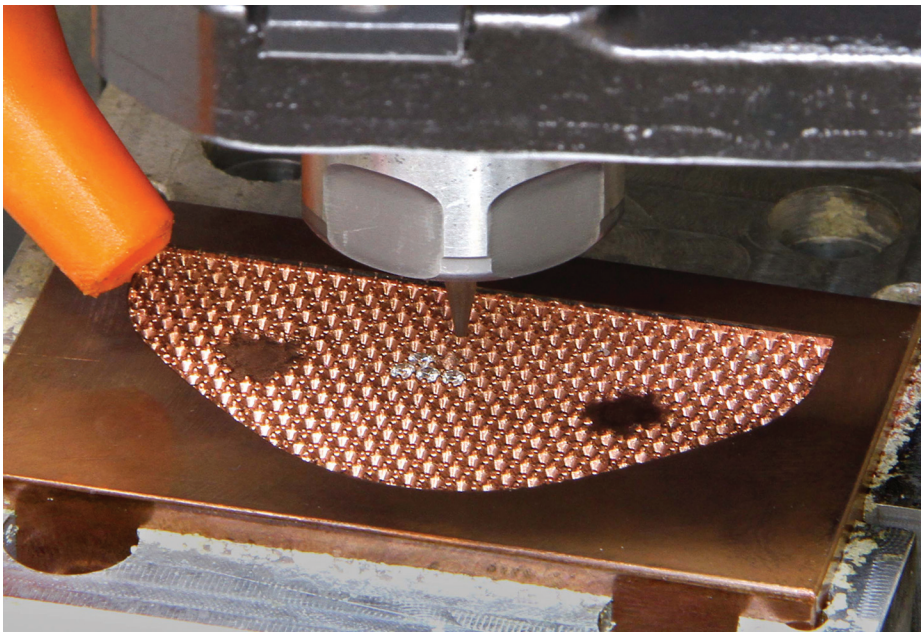
5-axis machining in jewellery manufacture

A Brother machining centre ideally suited to milling precious metals is the 5-axis TC-S2 DN -O, which has a 27,000 rpm spindle and 2-axis compound table. The machine is able to transform the metalcutting possibilities available to a jewellery producer. For instance, complex cutlery handles can be fashioned from solid silver in a 3+2-axis cycle for economical production in significant batch sizes.

In addition to machining end products, hardened steel tools for pressing products such as phosphor-bronze pen clips may also be produced on Brother machining centres.

Swarf reclamation and recycling is a priority in jewellery manufacture in view of the high value of the metals used. Boxes placed under the workpiece in each machine catch 80 percent of the swarf. The machining centres are usually cleaned down after completing each production batch and the remaining precious metal dust is retrieved from a fine filter, after it has been left to dry. In this way, over 98 percent of swarf is reclaimed.





Horizontal machining centre can have pallet changer retrofitted in the field

At the EMO 2015 machine tool exhibition in Milan, Averex Automation demonstrated for the first time a new, automatic pallet change (APC) system for its twin-pallet Akari HS-450i horizontal-spindle machining centre. Sole UK and Ireland agent is Whitehouse Machine Tools, which is able to demonstrate the machining cell at its showroom in Kenilworth.

Unusually, the servo driven, six-pallet unit is designed to be retrofitted in less than a day on a user's factory floor, although it can of course be factory fitted. Despite the higher productivity and extended periods of unmanned machining offered by APC, the user may not have needed or been able to afford it when originally purchasing the machine. Both 400 and 500 mm pallets can be used at the same time, offering flexibility for accommodating oversized parts and fixtures.

In 2012, when the 4-axis HS-450i was launched, a feature of the machine was the ability to retrofit another major option, namely an extension of the tool magazine. It is easy and quick in the field to expand the number of tool pockets from 80 through 120 to 220 tools, allowing the machining facility to grow with a user's business.

The 12-tonne machine's construction incorporates top quality components such as single-piece FCD600 castings for the

spindle and pallets, Tsubaki ballscrews, THK heavy duty roller guideways, a Tsudakoma rotary table, a high torque, temperature-controlled Fanuc spindle motor with BIG Plus 40-taper tool interface, Kosmek tapered cones on the automatic pallet changer which also has high pressure air clean, and Fanuc 31i NANO control.

By coupling these high-end constituents with economical manufacture in Taiwan, Averex is able to produce a very high precision machine at a competitive price. It is built to exacting standards and includes thermal management of the base casting, ballscrew nuts, thrust bearings, Y-axis servo mounting and spindle cartridge. The machine also boasts hand scraped surfaces for mounting the ballscrew bearing blocks and roller bearing slideways.

An air/oil mist system delivers precise, pressurised lubrication to the ballscrews, roller guideways and spindle bearings, reducing thermal growth and allowing cutting accuracies of 2.5 microns and repeatability of 2 microns to be maintained. Circularity and roundness are quoted as 3.6 and 2.1 microns respectively if the machine is installed in a temperature controlled environment.

The HS-450i is also fast, with a 15,000 rpm / 22 kW direct drive spindle and one-second servo-driven tool change, extending to three seconds when probes, special boring bars or heavy tools are being exchanged. Linear acceleration of 1 g to 60 m/min cutting feed rate around the 640 x 610 x 680 mm working volume ensure minimal idle times. Maximum workpiece size is 750 mm diameter by one metre high.

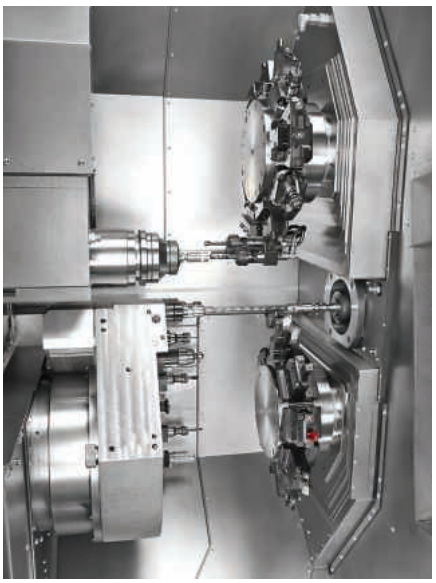
Field expandability by retrofitting a 6-station automatic changer for 630 mm square pallets is also an option for the larger Akari HS-630i twin-pallet horizontal machining centre.

Whitehouse Machine Tools Ltd
Tel: 01926 852725
Email: timw@wmtcnc.com
www.wmtcnc.com

Reverse end-working attachment reduces turn-milling times

The Traub TNL32-11 is a new addition to the German manufacturer's automatic lathe series, which is capable of sliding-head and fixed-head turning and milling. Availability in the UK and Ireland is through sole agent, Geo Kingsbury, Gosport.

The key feature of the machine is a 2-axis reverse end-working attachment mounted below the main spindle that increases the number of CNC axes to 11, allowing simultaneous machining with three fully independent tools. Significant savings in cycle times are possible, especially when producing components with a high proportion of drilling.



Like the TNL32-9, the TNL32-11 is a 32 mm bar lathe with a headstock moving in the Z-axis, an upper and identical lower turret with X, Y, and Z axes, an additional 100-degree B-axis on the upper turret and a counter spindle that travels in X and Z.

The reverse end-working attachment sits on an additional cross slide moving in the X and Z axes and makes eight additional tool stations available, four of which are for fixed tools while the remainder are live. There is also a station for a workpiece gripper that can unload a machined workpiece from the counter spindle, so while a finished workpiece is being discharged the next part can be undergoing machining with two tools at the main spindle.

With a 3.4 kW drive and a maximum speed of 12,000 rpm, the live tools in the reverse end-working attachment are both powerful and productive. The toolholders are robust and stiff with a shank diameter of 36 mm. Individually controllable coolant pressure up to 80 bar is available at every station. One live position can be used as a deep hole drilling station with a coolant supply up to 120 bar. The attachment can also be used as a tailstock for machining long components.

Alongside these advantages, the Traub TNL32-11 sliding/fixed headstock lathe (conversion takes less than 15 minutes) offers many other benefits. The turret technology is particularly impressive. Indexing is performed using an NC rotary axis that controls movement via an internal planetary gear. It allows the turret to be indexed to any position without the need for a mechanical locking mechanism. Free positioning of the turret makes multiple tool assignment possible at each station.

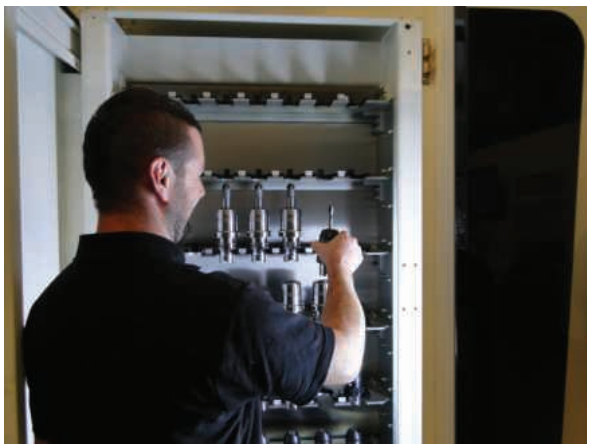
Geo Kingsbury Ltd
Tel: 023 9258 0371
Email: sales@geokingsbury.com
www.geokingsbury.com

Adding a new dimension to PCD tooling manufacture

Exactaform based in Coventry is a leader in the field of PCD tooling manufacture with strong technical skills which enable it to produce standard and special tooling for aerospace OEMs and Tier 1 suppliers as well as Tier 1 and Tier 2 automotive suppliers. Its tooling has been used on prestigious projects including the 787 Dreamliner and the Lightning 2.

Director Jamie White says: "This is a highly competitive and innovative industry. Our advantage is our flexibility, the high quality tools we deliver and our ability to offer some of the best lead times in the industry. The demand for PCD tooling is growing rapidly especially for the machining of carbon fibre in the high technology industries we support. Customers are examining cost/hole and cost/metre. For example, we can offer tailored solutions with special tooling geometry that will overcome delamination issues in carbon fibre and we developed a special tool for one of our customers that would cut and finish a carbon fibre slot in one operation instead of two, reducing cost/metre."

The company already has 12 conventional disk and wire erosion machines. However, in March 2015 it added a DMG MORI LASERTEC 20 PrecisionTool, which extended its capabilities from forming the edge profiles to including chip breaker geometry in its PCD tools. Jamie White says: "We carried out trials on several laser machines and we found that the DMG MORI LASERTEC 20 PrecisionTool was the ideal fit for us. Not only has DMG MORI been in the market the longest with this technology, but it uses HSK holders and LASERSOFT software for programming, which is very similar to what we use on the wire EDM machines, making implementation of the technology quick and easy for us. We can make whatever profile shape we like, simply importing a 2D profile into the software and following a question and answer session to arrive at the CNC programme. We found that the LASERTEC 20 PrecisionTool produces a keener, chip free edge and is slightly faster than the conventional machining methods. However, the possibility of adding a chip breaker on our PCD tips, all in one operation, was the main reason for the investment."



The LASERTEC 20 PrecisionTool has a pulsed 5-axis laser, is fitted with CELOS® and the Siemens 840D solutionline, and has the capacity for 42 HSK tools ready for automatic loading and cutting with the PH 10|100 linear magazine. Changing workpieces takes 30 seconds or less, and with CELOS a queue of work can be automated and monitored to give the ultimate in flexibility for single part and low volume production.

Using laser has some significant technical advantages for PCD as it can work through both the diamond and its binding material, which is especially relevant for course grained PCD grades. Erosion only cuts the binding material, while grinding can cause break-out of the diamond grains resulting in a rougher edge, which affects the quality and life of the finished tool. Furthermore, the production of chip breaker geometry in PCD is straight forward on the LASERTEC 20 PrecisionTool, but impossible with grinding and wire erosion, opening up a huge range of possibilities for Exactaform.

Jamie White says: "We are building a new factory, which will give us 40,000 sq ft and we are always looking to invest in the latest technology. The LASERTEC 20 PrecisionTool is the first in the country and our customers appreciate our commitment to implementing advanced technology. Additionally, we have the skills to support them with tool design and testing, highly skilled brazing processes and 100 percent inspection. We are customer driven and we are always looking for new ways to speed up production and deliver tools faster. The DMG MORI LASERTEC 20 PrecisionTool fits well as it is a high precision machine. It occupies less floor space, is at the forefront of technology, is impressive to look at, is faster than our other methods and gives us a significant opportunity in the chip breaker market. I am sure we will invest in more of these machines in the future."

DMG MORI UK
Tel: 02476 516137
Email: steve.finn@dmgmori.co.uk
www.dmgmori.com

The strong and silent type

Even if you're a big fan of high-performance cars and motorsport, chances are you have never heard of wheel manufacturer and Haas customer 2Elle Engineering, based a stone's throw from Venice, Italy.

"Our customers are big name companies," says 2Elle founder and owner Luigi Lucaora. "For example: BMW, Mercedes, Audi, German tuning house Brabus, and several race teams in different categories, from F1 to Paris Dakar. But, you won't see the 2Elle name on any of our products. We like to keep our brand below the radar, so we can work for all the big marques without compromise. We supply some of the best high-performance wheels in the world, and almost no one except the customer knows they come from here."

He is at pains to stress that despite its low profile, 2Elle is much more than a busy CNC machine shop. "I spent eighteen years as an engineer in the industry," he says, "so first and foremost, we develop new materials and new technology such as hybrids and lighter, stronger wheel designs for the fastest cars in the world."

Before the company moved to its current premises in 2008, 2Elle didn't make anything in-house. "We only did the engineering, development, and quality control," explains Luigi Lucaora. "We subcontracted machining for 2 years, and then, when we invested in our first CNC machine tools, we decided immediately to start up with Haas CNC machines. Our subcontractor already used them and we'd heard many good things. We bought three Haas CNC lathes: two ST 40s, an ST-30 and a Haas VM-6 vertical machining centre.

"It was one particular order that really kick-started the company," Luigi Lucaora recalls. "An important German tuning company offered me a large contract if I promised to meet certain delivery criteria. I went to the bank with their letter of intent, and that was enough of a business plan for them to lend us the money to move to this new factory. Since then, we have grown at least twenty percent each year. Last year, we managed forty percent. In just seven years, we've come from nothing to a turnover of around five million Euros."

The 2Elle factory may appear cavernous, but the empty space soon will be filled, as deliveries of blank wheels arrive from the company's forging supplier in the U.S. "We receive three or four shipping containers every month. In total, we currently produce between 1000 and 1200 finished units a month."

The company's Haas VM-6 operates for at least two and a half shifts a day, mostly manned. "During the day, we load the machine with just one wheel at a time," says Luigi Lucaora. "But, at 10 p.m., we load two wheels and set the machine working overnight, 'til 4 a.m. The next shift comes in and unloads the parts at 6 a.m."

The Haas VM-6 is a 40-taper mould-making machine with 12,000 rpm spindle and travels of 1626 x 813 x 762 mm. The Haas-built 12,000-rpm inline direct-drive spindle, combined with the Haas high-speed control with full look-ahead, provides the accuracy and fine surface finishes mould makers and other high-precision industries demand.

"The shapes we're machining are similar to moulds, so the VM-6's high-speed spindle and feeds are perfect," says Luigi Lucaora. "The table is T-slotted in X and Y, which makes it easy to secure our parts. We're also buying a smaller Haas VM-3 mould-making machine, for some new hybrid wheel projects we're working on. These wheels will be made using alloy hubs coupled to carbon fibre rims, so the engineering and machining challenges will be interesting.

"Not only are the Haas machines easy to use, but we have also noticed that, in comparison with other machines, and we have several types in our factory, the service and support are far superior.

Luigi Lucaora makes regular trips to the company's forgings supplier, in the U.S. "I was there on a visit when it was Haas' 30-year anniversary celebration," he says, "so I dropped by the factory and had a guided tour of the facility. I was very impressed with the company's organisation and quality. They use hundreds of their own machines to make new Haas machines, in a very high-volume production environment."

Haas Automation Ltd
Tel: 01603 760539
Email: cnc@haas.co.uk
www.haas.co.uk

Fidia machines now available in the UK

Effective from the 1st January 2016, world class machine tools manufactured in Italy by Fidia will be available in the UK and Ireland via newly appointed exclusive agent, TDT Technology.

Founded in 1974, Fidia is today an established and respected manufacturer of high speed milling machines and CNC systems. Listed on the Milan stock exchange since 2001, the company is headquartered in Turin and has around 330 employees worldwide. TDT will offer the entire Fidia range with the exception of the company's standard three-axis vertical machining centres.

At present, Fidia's worldwide sales comprise 80 percent machines and 20 percent from the supply of CNC systems to other machine tool manufacturers. In the UK there is an installed base of around 70 Fidia-controlled machines, which includes a number of the company's own models. Existing users in the UK and Ireland can now contact TDT Technology for sales, spares and service.

Available in the UK will be the newly enhanced Fidia D range of 5-axis milling machines, along with the GTF range of 5-axis gantry machines, the Y2G series of double traverse gantry models, the K range of 5-axis high speed milling systems, the Y2K series of double productivity 5-axis milling machines, the KR series of 6-axis high speed mills, G996 high performance 5-axis milling centres, H664 compact 5-axis machining centres, and Fidia's full range of CNC systems.

The recently enhanced D range of 5-axis milling machines offers both 3+2 and simultaneous 5-axis finishing of surfaces with high speed spindles. With hundreds of installations worldwide, the D218 (2000 mm X-axis), D318 (3000 mm) and D418 (4250 mm) are now newly enhanced to ensure rapid return on investment. Today, the D family of machines offers cutting speeds up to 22 m/min cutting speed, a new Z-axis counter-balance system and an active cooling system. Applications include plastic injection moulds, die casting dies, aluminium aerospace parts, graphite electrodes, resin models, tyre moulds and jet engine disk slots, to name but a few.

The Fidia GTF gantry line is characterised by its versatility. Thanks to its modular structure, and taking advantage of a combination of components selected according to weight, stiffness and cost requirements, GTF machines are ideal for a host of applications in sectors such as automotive, aerospace and general machining. Due to in-built modularity, X-, Y- and Z-axis strokes of several metres can be supplied to match customer requirements.

Fidia's Y2G series of 5-axis gantry models further enhances the modular concept of the GTF range. Y2G machines feature two independent heads either working together on the same workpiece, or on different parts (separated by a bulkhead), thus allowing productivity to be doubled.

The K-range of 5-axis high speed milling systems is designed specifically for both large plastic injection moulds and aerospace components. The fixed bed type machine structure gives consistency of forces independent of workpiece weight, allowing for optimum milling quality. Several models are available, with the largest machines extending beyond 10 m in the X-axis.

The Y2K series of double productivity 5-axis milling machines is essentially two K-series machines facing each other, sharing the same workpiece table. Y2K machines integrate all the benefits and versatility of two independent 5-axis milling systems driven by two synchronised CNCs. Productivity is therefore doubled compared with a traditional portal machine.

Fidia's KR series of 6-axis high speed mills is based upon a K-line concept and characterised by the integration of the 5-axis head with a continuous rotary table. The rotary table is sized according to the machine application, and allows for the machining of workpieces of more than 2000

mm in diameter. The use of the sixth axis as a rotary workpiece table guarantees maximum accessibility from all sides.

Fidia's G996 is a compact upper gantry milling system characterised by its strong monolithic structure. It is aimed at the machining of small and medium-size workpieces, regardless material stiffness and toughness. The large cast iron bed of the G996 provides a stable platform, while the open front ensures wide visibility.

Last but not least, the Fidia H664 is a line of compact 5-axis machining centres with X-, Y- and Z-axis travels of 600, 560 and 400 mm, respectively. HS664V machines are equipped with a 1000 x 550 mm fixed table, while HS664RT machines have an integrated rotary-tilting worktable.

From a CNC perspective, recent enhancements include new V5 'look ahead' software that features new algorithms for tool path control with three and five interpolated axes including optimisation of the dynamic behaviour of the machine.

Tested on the same machine against a well-known German-manufactured control, V5 software ensured that the Fidia CNC delivered 20-30 percent faster cycle times with better surface finish.

TDT Technology says that a Fidia machine will feature on its stand at the forthcoming MACH 2016 exhibition at the Birmingham NEC from 11th-16th April, where the company has booked its largest ever stand (measuring 200 sq m.

TDT Technology Ltd
Tel: 01788 570411
Email: sales@tdt-technology.co.uk
www.tdt-technology.co.uk

MACH Hall 5 Stand 5440

Installation of largest Sodick wire erosion EDM in UK

Smethwick-based precision engineering company A&M EDM is continuing its expansion programme with a major investment in additional EDM, laser welding, metrology, cylindrical grinding and fabrication capacity, including the largest Sodick wire erosion EDM in the UK. This will enable the company to handle even larger pieces of work and support its continued growth. Turnover has increased by 16 percent in the last 12 months, accompanied by a ten percent increase in staff numbers.

The new development comes less than a year after A&M EDM opened a second facility adjacent to its existing premises in Smethwick, West Midlands and purchased nine new CNC machining centres. By increasing the capacity of both its computer controlled and hand machining services, supported by a research and development service to advise customers on design for manufacturing, the company can now tackle almost any metal and composite machining requirement.

As well as the Sodick wire erosion EDM, the new equipment includes two Hurco

machining centres and a mobile open laser welder which can be taken off site to carry out in situ repairs on equipment which cannot be moved. A large CMM with a capacity of 1.2 m x3.0 m x 10 m and both touch and scanning probes enables A&M EDM to provide quality assurance on its largest pieces of work as well as to offer large-scale metrology services to other engineering companies in the area.

The company has increased capacity of its popular cylindrical grinding service by adding two new machines and setting a up a dedicated area for this service in its Park Rose facility. The final change has been to take a precision engineering approach to fabrication, with staff designing and building a laser welding table with predefined angles which enables them to work to tolerances of around 0.3 mm.

"Our business has been built on meeting the requirements of the most demanding customers in the aerospace, defence, medical and automotive sectors, who come back to us again and again because they know we won't let them down," explains managing director Mark Wingfield. "The larger equipment opens up new markets and means we can also provide laser welding and metrology services to other precision engineering companies.

"By offering this extended capacity and what I believe is a unique combination of CNC and hand machining, we can meet manufacturers' demands for very tight turnaround times on everything from prototypes and one-off pieces to small production runs and press tools.

A&M EDM
Tel: 0121 558 8352
Email: kevin@amedm.co.uk
www.amedm.co.uk

Intelligent use of non-productive time

Robots can free up additional capacity for machine tools and increase productivity

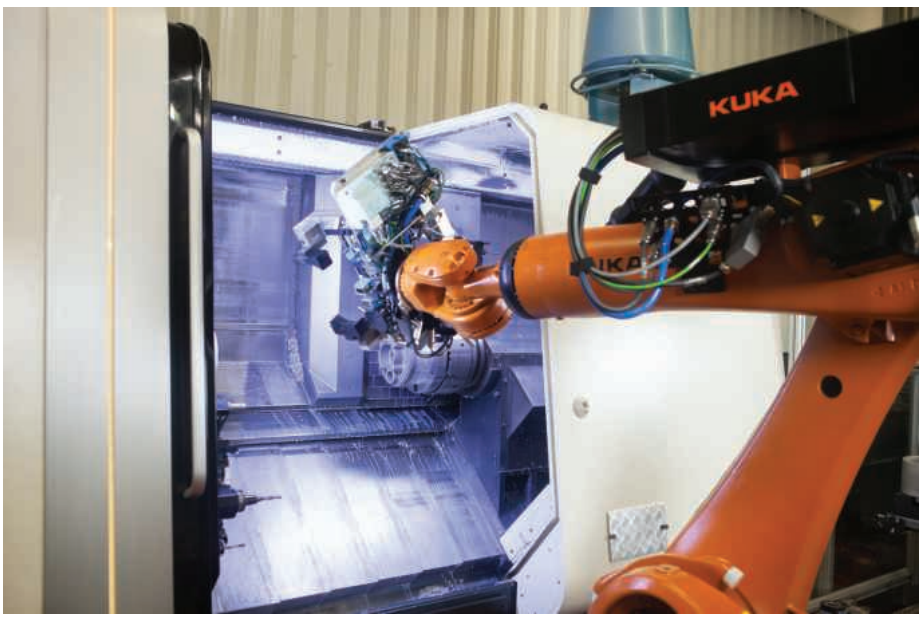
According to an industry study from 2013, German machine tool operators see their greatest challenges as ever-shorter delivery times and the increasing complexity of the components to be machined. At the same time, quality requirements are rising and prices are falling. The measures that companies are taking to meet these challenges include investment in machining centres, in milling machines and lathes as well as in automation. The focus is shifting increasingly onto robot-based automation, for good reason.

In the past, machine tool and mechanical engineering companies assumed that the automation of machine tools was only suitable for mass production. Manufacturers with batch sizes of 100 or with components that have long throughput times in excess of 90 seconds have only rarely been taken into account. However, the new challenges are gradually leading to a rethink. Outsourcing to countries with a lower wage level is increasingly reaching its limits in terms of the need for short supply chains, the hiring of specialist personnel and quality control. The degree of automation in the industry, when compared to other sectors, is currently at a lowly 1.5 percent, but the pressure to automate is building.

Higher robot performance at a lower price

Automation using robots can be the right answer here. Robots work with a very high degree of precision and, even with complex and heavy components, the reject rate is practically zero. They can work around the clock, and their performance is just as good after 24 hours as in the first minutes. In heavily automated production shifts, they improve the capacity utilisation of the machines and reduce the unit labour costs. Beyond this, unlike wages, the costs for robots have decreased continuously, while their performance has increased at the same time.

As an example, the price/performance ratio of a KUKA robot has improved by a factor of six in the last ten years. The robot and associated software have been continuously upgraded and, as a result, are more user-friendly. They can be effectively used in more and more applications. This capability makes them highly attractive today in entirely new areas of machine tool manufacturing.



Versatile helpers for handling, machining and assembly

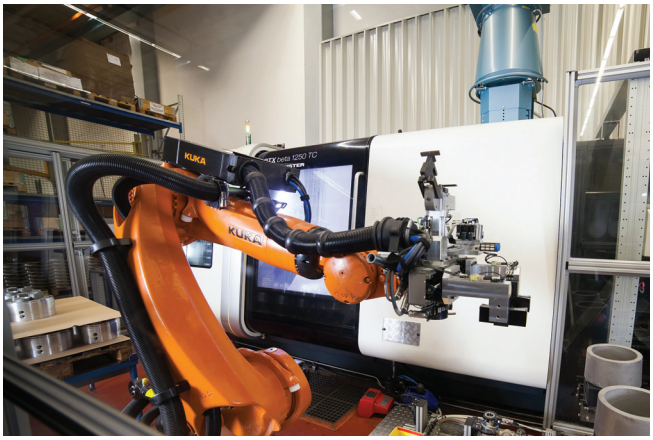
Already today, robots load machine tools quickly and precisely with blanks and then remove the machined parts. During the operating time of the machine tool, the robot can use non-productive time effectively and carry out tasks such as drilling, brushing and deburring. This reduces the spindle run time per part. On components requiring intensive machining, the robot can also carry out roughing, leaving the machine to take care of the smoothing alone. Where productivity is concerned, every second counts. About 20 percent of all machine tools can be operated more efficiently in conjunction with robots. It is true that a robot cell can double the investment costs for a machine tool. However, the payback period is often only two years, even with an extensive range of parts.

Robots are helping to build KUKA robots in Augsburg

At KUKA Roboter GmbH in Augsburg, six robot-based solutions are in use. In the case of long machining times, the robot can be gainfully employed between the loading cycles. For example, a robot of the KR QUANTEC series is deployed in the machining area (where parts of the in-line wrists for KUKA robots of the same series are manufactured) to make use of the non-productive times of an automated machine tool. It not only loads the "DMC80 U Duo Block" machining centre from DMG MORI with blanks and unloads the machined parts from the machine, but also machines the sixth side of the workpiece and then deburrs it. All the machining steps that are required in production of the workpiece are carried out entirely in the new cell. The automation system is designed in such a way that it can be simply adapted to changing production procedures. The result: KUKA is now producing about 4,500 more parts per year than before the automation.

The use of robots in two further machining centres at Augsburg has resulted in an average increase in productivity of more than 15 percent. Since 2013, DMG MORI machine tools have been manufacturing 14 components from castings and sawn sections that are then installed in the adjacent robot assembly shop. A KR 150 R2700 extra robot loads and unloads the machine tools. Once a layer of the pallet has been completely filled with machined components, the robot picks up the suction gripper and takes a cardboard slipsheet from another pallet. It then sets it down on the completed layer of finished parts. Once the carriages on the supply conveyors are empty, the robot places them on the return conveyor. The robot-based solution allows KUKA to machine a large number of different components and to flexibly adapt the batch sizes to the quantities required.

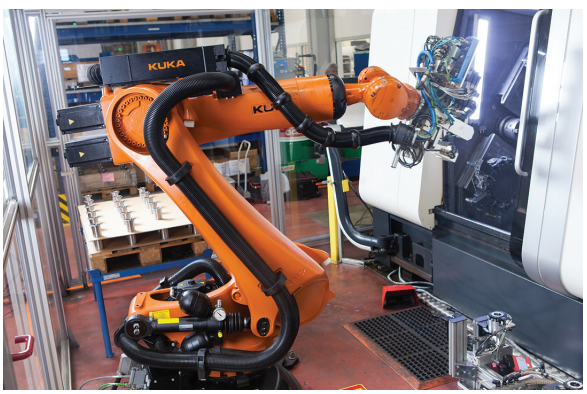
This automation solution is characterised by its high degree of flexibility in the smallest of spaces. Thanks to the buffering of the components, a maximum unmanned runtime of eight hours is made possible. KUKA has managed to reduce the cost-per-part while also increasing the operating hours, without the need for additional resources.



In the case of the Burkhardt & Weber machining centre at KUKA in Augsburg, the machine is loaded and unloaded by a KR 500 robot that also processes the workpieces, measuring up to 1.5 m in length, during otherwise non-productive time. As a result, productivity has increased by ten percent. Compared with a conventional solution, KUKA has since been able to machine 300 more components each year. The greater productivity is attributable to the fact that system operation is 70 percent unmanned and additionally that night shifts run in fully automated mode.

Whereas, in the past, each system required one dedicated operator per shift, automation enables staggered working practices. The operator no longer has to carry out the time-consuming loading of the workpieces directly into the fixture, but places them on the simply-designed locations of the material feeder to the robot. The material feeders are designed as two-axis positioners and are implemented in the robot controller as axes seven and eight. The two material feeders can each carry eight parts.

This is enough to keep the system running in unmanned operation for eight hours. Prior to automation, it took up to 15 minutes to clamp a workpiece. The robot now only requires two minutes. The precise alignment of the workpiece, which was physically strenuous for the operator, is dispensed with by the robotic loading, which also eliminates the risk of damaging the expensive clamping equipment during loading and unloading with the crane.



Beyond this, downstream tasks, such as deburring the machined workpieces, no longer have to be performed since this task is also carried out by the robot. KUKA expects a payback period of no more than 2.6 years. If non-productive times can be more effectively utilised, for example, by drilling holes on the link arm and rotating column, this period might be even shorter.

Simple operation guaranteed

6-axis robots are suitable for machining and handling tasks directly at the CNC machine. In order to keep training requirements to a minimum, machine tool manufacturers must pay attention to the ease of operating the robots. The central user interface of the KUKA robot on the SINUMERIK-CNC opens up the possibility of seamlessly integrating robots into machine concepts and production processes using the KR C4 controller, for instance. This minimizes the training requirement for employees since the operator control panel of the machine tool makes it possible to display, operate and program KUKA robots in the same system that the user is familiar with from using the machine tool.

Conclusion

The examples make it clear: there is potential for productivity increases in every manufacturing step. The use of modern robots allows the potential of machine tools to be tapped through a wide variety of automated processes, such as marking and measuring workpieces, as well as quality control in the machine during the manufacturing process. Performance can be fully maximised, especially if the robot is linked to multiple machines.

KUKA Robotics UK Ltd
Tel: 0121 505 9970
Email: sales@kuka-robotics.co.uk
www.kuka-robotics.co.uk

Talon and WNT partnership puts Ariel in the frame

Second generation business Talon Engineering is a world leader in the manufacture of sprockets, hubs, wheels, clutch baskets and engine casings for the off-road motorcycle community. Its products are exported to over 35 countries and through innovative manufacturing techniques it has developed market leading products. Maybe less well known is the fact that it also operates a subcontract machining business alongside its mainstream products. This side of the business is currently experiencing significant growth and has attracted customers from agriculture, marine, aerospace, rail, motorsport and nuclear. Most recently though, it is proud to have been awarded preferred machining supplier status from The Ariel Motor Company, which is leading to further growth in its subcontract services.

Ariel has a history dating back to 1870, but in the modern era it is best known for its Ariel Atom sports car, with its face contorting performance. It has now gone back to its roots and created the two-wheel equivalent of the Atom in the Ariel Ace. This innovative motorcycle takes certain design cues from the Atom, especially the frame, which is where it called on Talon Engineering for help in its manufacture.

"We were approached by Ariel in April 2014 when we were initially invited to machine a set of six frame components in order to get the bike ready for its official launch in June. As it happened we ended up with a total of 23 parts to machine and given their complexity it was a challenge from a programming, machining and tooling perspective, especially with such a tight timeframe," says Graham Alford, Talon Engineering's operations director.

The left hand 'Wing Spar' frame member of the Ariel Ace motorcycle. The machined finish was a specification of Ariel

Because of this compressed timescale, it was necessary for Talon to machine the parts as best they could, utilising tools that they thought would do the job out of the WNT catalogue. The major problem was one of reach, as the free-form design of the wing spar (the name given to the left and right halves of the frame) created some extended tool setups, which were overcome using standard tools from WNT and also the WNT Centro P toolholding system.

"The big advantage we had in those early days was that we could discuss what we wanted out of the WNT catalogue and order it in the knowledge that it would be here the next morning, this allowed us to shorten the development time considerably," says Graham Alford. The success of the initial batch of machined parts and the fact that on its launch the Ariel Ace was well received with 20 orders being placed for the £20,000 motorcycle, whose typical selling price is nearer £40,000 when customers have worked through the options list. The result was that Ariel invited Talon to add to the work it did for them, increasing the parts inventory to 90 across the Atom car and Ace motorcycle.

The most challenging element of all this work remained the seven-piece frame assembly. Machined from a solid 150 kg

A fully assemble frame unit for the Ariel Ace along with a 3D printed model that was used to aid visualisation of the complex form before a cut was taken. The girder-style forks are also manufactured by Talon Engineering

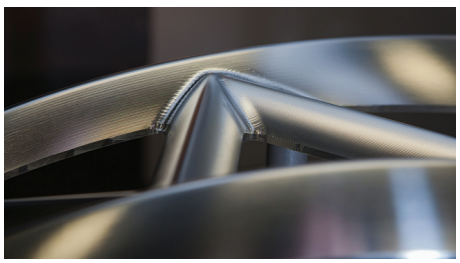
billet of aluminium the wing spars once fully machined weigh just 6.5 kg, so efficient metal removal is vital. Adding to the challenge was the complex form which had to be machined on a 3-axis YCM NSV102 machining centre, making full use of its 15,000 revs/min spindle and 48 m/min feedrates. The complexity of the part is highlighted by the fact that the program for the second operation runs to almost one million lines of NC code, with further challenges thrown in by Ariel, which wanted to retain machining marks on the finished part, something that required manual intervention in SolidWorks to create non-standard toolpaths.

To achieve the optimum tooling package, Talon process engineers Mark Webber and Sandy Bradley worked together with WNT's technical sales engineer Ian Tattersall and applications sales engineer Vince Whitham to rationalise the tooling and toolholding, with new fixturing being designed and manufactured in-house at Talon. Having got the basic machining process right using WNT's W-HPC cutters on the initial pre-production batch, the decision was taken to switch over to the recently introduced range of WNT cutters for aluminium. The gentler cutting action of these tools was ideal for the part, which due to its free-form shape had very few, and limited clamping points, with thin wall sections and lots of unsupported material.

As a result of this collaboration between Talon and WNT (UK), the cycle time for the frame wing spars was reduced by 50 percent, tool life, which on a cycle running to many hours was vital, was also better controlled due to management of the roughing process to leave even stock levels for the finishing cuts. The use of the WNT Centro P toolholders, with their accuracy and increased gripping power was also beneficial given the long overhangs required. In order to maximise cutting data three different tool lengths were used across the machining process to help keep extensions to a minimum and once the process was proven all of the tooling was migrated to the two on-site WNT tool vending units to ensure a supply of tooling was available at any time.

The whole project has been one of partnership that has seen iconic British name of Ariel return to motorcycle manufacture, with Talon Engineering collaborating on both design and manufacture and WNT (UK) working alongside Talon to ensure optimum machining of these complex components.

Talon's Process Engineer Sandy Bradley inspects the result of almost one million lines of NC code



The machined surface on the external face was specified by Ariel. On the inside face, deep pockets remove even more weight from the original 150 kg billet

"We worked closely with Ariel to develop the parts and in-effect reverse engineer them for ease of manufacture, this included developing a machined lug system that held the parts together for welding. It was also important to review how we machined these parts to minimise cycle time. This is where our partnership with WNT came to the fore, without this collaboration we could not have achieved the cycle time savings and efficient machining process that we did. Working in this way has helped the sub-contract side of the business grow by over 100 per cent in the past two years and, with partnerships such as this with Ariel, we expect that positive trend to continue. Developing this side of the business is a major commitment, we already have ISO 9001 and through our journey on the Fit For Nu-clear programme we will be adding ISO 14001 and 18001 to our credentials," says Graham Alford.

The result of the Ariel Motors project can be seen at MACH 2016 when a completed Ariel Ace frame will take centre stage on the WNT stand 5641 alongside the tools and toolholding that helped to achieve the dramatic cycle time savings. Visitors will also be able to chat with WNT's technical sales and application sales engineers about this and similar projects, where they have made significant improvements in productivity for customers.

"What is really nice about this project is the fact that it highlights the depth of talent within British design and manufacturing. The cutting edge design of the Ariel Ace and the highly intricate machining that had to be undertaken to deliver the machined frame and other parts to the exacting specification of Ariel is testament to the fact that British manufacturing remains a world leader," says Adrian Fitts, business development manager, WNT (UK).

WNT (UK) Ltd
Tel: 0800 073 2 073
Email: tony.pennington@wnt.com
www.wnt.de/en-en

Talon Engineering Ltd
Tel: 01935 471508
Email: talon-engineering@talon-eng.co.uk
www.talon-eng.co.uk

Thread milling maximises productivity

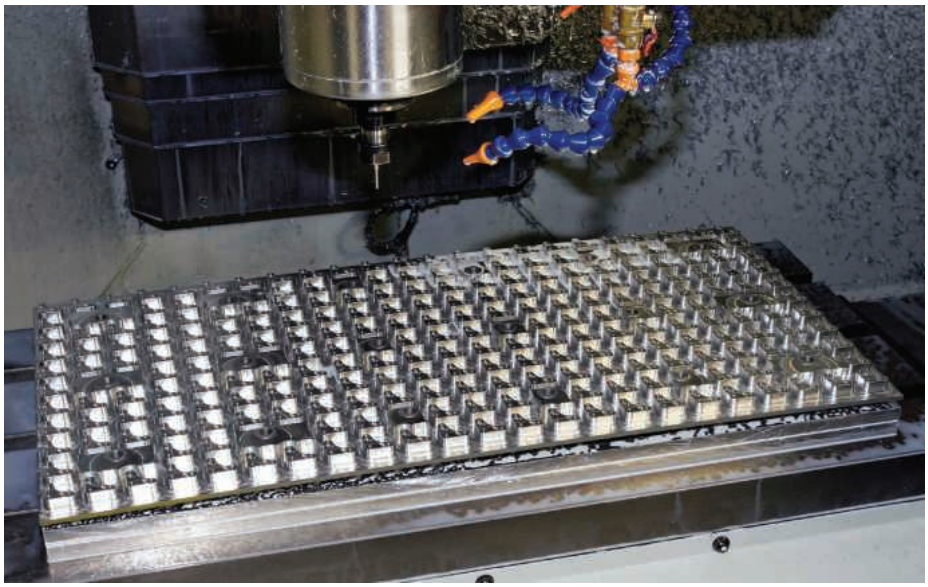
The introduction of DCG three tooth thread milling tooling supplied by Horn Cutting Tools Ltd has significantly improved production efficiency for DW Engineering Ltd of Burnbank, Hamilton. DW is a machining subcontractor specialising in high precision components produced in a diverse range of materials for a wide range of industry sectors.

The advance relates to high precision machining of aluminium components. They are sculpted from a 30 mm thick base plate, with 226 'body' components machined while remaining integral with the base to provide secure locations for further operations. Key among these are the generation of three identical internal M3 fine threads to be machined to a depth of 8.0 mm.

Prior to application of the Horn tooling DW Engineering used conventional machine tapping tools for this type of feature. It had several shortcomings as DW managing director David Watt explains: "The tapping process was quite slow, and it is also the case that the life of the available taps, at around 200 finished holes per tap, was insufficient for us to complete a full machining table load of 226 components/778 threaded holes without the need for time consuming replacement of the tapping tools."

In practice there were additional problems such as unclean threads and occasional tap breakages, dictating a need to keep the machining operation under constant observation.

"We tried a few alternatives before we became aware of the Horn DCG system," David Watt recalls. "Initially we had reservations based on the apparent delicacy of the tooling, its cost and our unfamiliarity of thread milling on such small features. In practice we were quickly convinced of its worth."



All of the requirements on the company's wish list were found to be achievable. As well as a single three edged DCG tool being capable of completing multiple 'batches' of threads, a single batch can now be machined in 6 hours marking a reduction of 5 hours. Moreover, the threads produced are 'bang on' in terms of quality and cleanliness, and scrap is now an unknown entity on this job.

"A further big gain is in process reliability as it is now possible to carry out the threading process unmanned. Moreover Horn thread milling tooling has subsequently found use on a number of other applications." David Watt concludes.

Gear milling

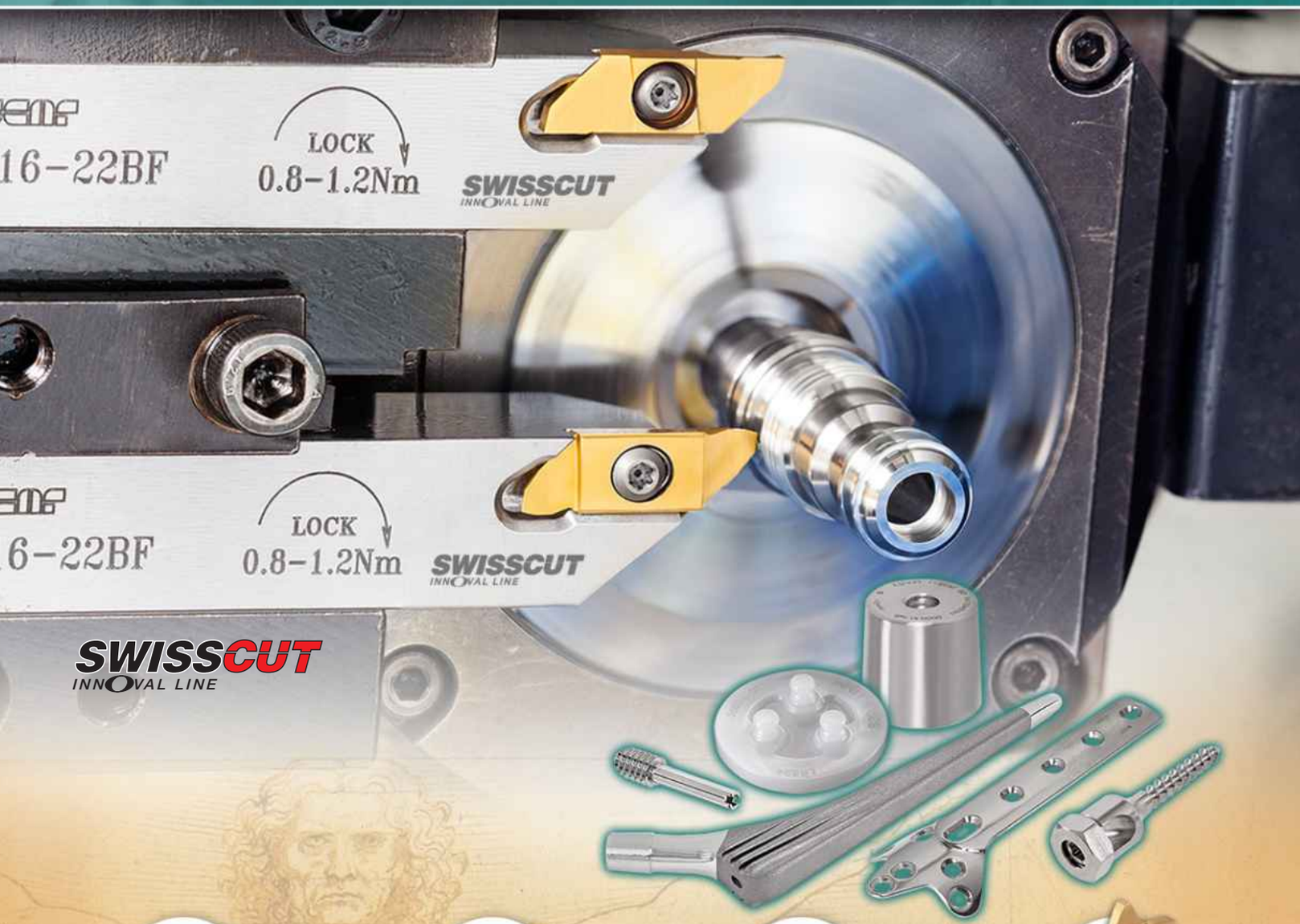
Horn is expanding its range of standardised gear milling cutters for DIN 3972 gear teeth that fall into the reference profile 1 category, now offering products that cover modules 0.5 to 4 entirely.

Between modules 0.5 and 3, Horn provides AS45-grade carbide circular milling cutters from the 613 to 636 ranges, screwed into place on the face side and available with a variety of diameters. Six teeth around the circumference ensure outstanding productivity, even when faced with high-strength materials.

Between modules 3.25 and 4, Horn offers single-row and two-row cutter heads with standardised two-edged S279 indexable inserts. The axial screw connection for the indexable inserts enables high numbers of teeth and a narrow pitch. The indexable inserts are ground with the utmost precision around the circumference and on the face. In cases where fewer teeth are present on the gear wheel, a two-row cutting division is used; this also applies to wider tooth profiles. Thanks to this cutting division, the two-row version of the indexable inserts exerts less cutting pressure on the tool, the workpiece and the machine resulting in a better quality product.

Horn Cutting Tools Ltd
Tel: 01425 481800
Email: info@phorn.co.uk
www.phorn.co.uk

ISCAR's High Productivity Machining Solutions for the Medical Parts



SOLIDMILL
SOLID CARBIDE LINE
The economical family of solid carbide endmills

CUT-GRIP
GEHSR/L-SL tools with side clamping mechanism

SUMOCHAM
CHAMDRILL LINE
Standard exchangeable small diameter drills

PENTACUT-24
PARTING GROOVING LINE
Multi-cornered inserts with five cutting edges

Machining Intelligently

ISCAR HIGH Q LINES

Member IMC Group

ISCAR

www.iscar.co.uk

Blaxx F5055 mill extends Walter cut SX grooving system

Leading tooling manufacturer Walter has announced the Blaxx F5055 parting and slitting mill as part of the Walter Cut SX grooving system. Like its Blaxx range stablemates, F5055 boasts extremely robust and precise construction, as well as outstanding performance and process reliability.

Available in diameters of 63 to 250 mm for insert widths of 2 to 4 mm, F5055 features Tiger·tec Silver indexable inserts with WSM33S and WSP43S cutting materials in three geometries: the stable CE4 for medium to high feed rates and applications with good chip compression; the universal SF5 for most materials and low to medium feed rates and the easy-cutting CF6 for good machining conditions and low feed rates or for non-ferrous metals.

The tool is suitable for cast-iron, steel and stainless steel components.

The F5055 cutter is part of the Walter Cut SX grooving system which is based on self-gripping, form-locking indexable inserts and extremely favourable cutting force guidance into the tool. The flexible top clamp can be relieved or can fully deploy its clamping force. The effect is a safely anchored indexable insert and, as a result, excellent process reliability. Indexable insert losses are almost completely eliminated.

The F5055 design ensures safe clamping of the insert even at higher speeds and, as a result of the cutter body's excellent concentric and axial run-out values, vibration is minimised.

In addition, because Walter Cut SX and F5055 use the same indexable inserts, users of both tooling systems benefit from reduced inventory costs.

Eight-edged inserts generate cast iron savings

The Xtra·tec F4049 close-pitch finishing face and shoulder mill for precise 90 degree shoulders from tooling giant Walter GB represents a new and highly efficient machining concept for cast iron applications: once set, roughing and finishing operations can be performed with the same tool, and therefore at much reduced production costs.

Available in diameters from 50 mm to 160 mm and for cutting depths up to 6.5 mm, the F4049 accommodates a choice of two roughing and two finishing geometries having a negative basic shape.

The specially-developed square indexable inserts each have eight cutting edges that utilise Walter's renowned Tiger.tec or Tiger.tec Silver materials for maximum tool life. The eight cutting edges not only remove metal efficiently but they also generate considerable insert cost savings.

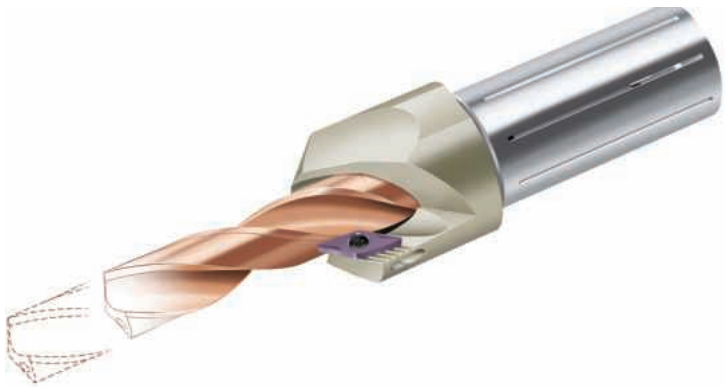
Insert retention by special clamping wedge provides reliable stability. The precise position of the finishing insert/s can be set using a countersunk screw and expansion wedge. The adjustment mechanism is extremely precise and creates a very stable insert seat thanks to form lock fixing, which leads to particularly high workpiece surface quality during the finishing process. Surface finish patterns can be varied to suit component joint faces requiring differing intermediate seal types.

New 'all in one' chamfering tool cuts costs

Drilling and chamfering in one cost-effective operation is now possible with the Xtra.tec D4580 from tooling giant Walter GB.

The new chamfering tool can be quickly fitted with solid carbide drills of 4 to 16 mm diameter, enabling users to easily switch drills for different holes sizes and depths, and for varying materials.

This reduces overall tooling costs and tool changes, and compares favourably to the traditional route of using dedicated pilot hole chamfer drills and solid carbide chamfer drills with defined hole diameters and depths in terms of flexibility. Chamfers



are cut by the Xtra-tec D4580's pair of double-edged universal indexable inserts, which feature a multi-layer coating for long tool life. With a hard nickel plated surface that protects against wear and corrosion, the tool can be operated with or without internal coolant.

Walter GB Ltd
Tel: 01527 839450
Email: gerry.ohagan@walter-tools.com
www.walter-tools.com

Tool life tripled

MAPAL develops new cutting material series for boring

Tools with ISO elements (inserts) are first choice when it comes to the boring of cast materials. As the need for high cutting speeds and better cooling technologies rises, the demands on the tools and cutting edges increase, too. Very good friction and wear behaviour and high hot hardness of the coating are therefore elementary. Until now boring operations have been widely performed using PVD-coated cutting edges.

MAPAL has now developed a CVD-coated cutting material series specially tailored to the demands of boring in all cast materials - GJL, GJV and GJS. The new cutting materials HC720, HC725, HC730 and HC735 differ in the carbide substrate used in each case. All four impress with their extremely heat-resistant α-aluminium oxide coating with very good coating adhesion. Cutting edges with the new coating offer the potential for a significant increase in the cutting speed during boring, even with dry machining. Machining is

easily possible with a cutting speed of 300 m/min, thus offering a considerable boost in productivity. At the same time, the cutting edges achieve significantly longer tool lives, as examples in practice show: When machining GJL25, the tool life was tripled compared with the PVD cutting material HP455 used to date.

The whole standard MAPAL product range of indexable blades for ISO boring tools is available with the new cutting material series.

MAPAL Präzisionswerkzeuge Dr. Kress KG is one of the leading international suppliers of precision tools for the machining of practically all materials. The company founded in 1950 supplies leading customers from the automotive and aerospace industries and from machine and plant engineering. With its innovations the family-owned company sets trends and standards in production and machining technology. MAPAL sees itself as a technology partner, supporting its customers with the development of efficient and resource-conserving machining processes using individual tool concepts. The company is represented with production facilities, sales subsidiaries and representatives in 44 countries worldwide.

MAPAL Ltd
Tel: 01788 574700
Email: sales@ukmapal.com
www.mapal.com

Making WAVEs

Sumitomo Electric Hardmetal's highly successful 'WAVE Mill' WAX 3000 series of shank and shell-type milling cutters, developed specifically for roughing and finishing aluminium alloys, non-ferrous materials and hard plastics without coolant has been expanded with the introduction of the WAX 4000 range. This latest range covering cutter diameters between 22 mm and 24 mm diameter is capable of creating true 90 degree shoulders.

Important in the success of the 'WAVE Mill' WAX is the hard carbon thin film Auroracoat DLC (Diamond-Like-Carbon) chemical vapour deposition coating giving new orders of high hardness with an extremely low 0.1 co-efficient of friction. These ultra-fine surface coated inserts with excellent adhesion characteristics overcome chip adhesion (built up edge) a major source of problems often limiting performance when machining aluminium alloys.

Sumitomo's WAX cutters can be effectively used for face, progressive ramp cutting and helical milling applications creating true 90 degree shoulders due to the high accuracy combination of the insert and pocket. Cutters can be run at high speeds up to 5,100 m/min through the latest safety enhanced pocket with centre screw insert location which restricts any insert dislodgment though any increase in centrifugal forces. Depending on the application, higher feed rates up to 0.25 mm per tooth can be used.

Smooth chip flow, created by the DLC coating and the highly developed 'Wave' design of the insert series significantly reduces cutting forces and helps to extend tool life. Again, the ultra-low coefficient of friction at the cutting edge with the resulting reduction in cutting force also increases the exit velocity of the chip from the cutting zone. It also has the beneficial effect of increasing the shear angle, chip thickness and the resulting curl size. Meanwhile, as chip contact time with the insert is reduced, this further lowers the generation of frictional heat.

DLC coated AECT style inserts are available with nose radii between a very sharp 0.4 mm and smoother 5 mm. WAX

endmill cutter bodies are now available in short (E) or extended length versions (EL) up to 220 mm overall length and in diameters of 20 mm, 25 mm, 32 mm and 40 mm. WAX 3000RS and 4000RS shellmill bodies having a diameter range between 50 mm and 125 mm can be specified with between four and seven teeth and two and six teeth respectively.

Sumitomo Electric Hardmetal Ltd
Tel: 01844 342081
Email: trevor.tolley@sumitomotool.com
www.sumitomo-hardmetal.co.uk

Breaking new ground in cutting tool manufacturing

Cutting tool specialist Marlor Tooling has broken new ground in cutting tool manufacturing by being the first company in the UK to install a Sodick high-speed EDM machine for the fast, highly accurate and automatic production of coolant though-holes in HSS and carbide, as well as PCD/CBN-tipped tools.

The use of internal coolant can extend tool life by over 200 percent.

Holes of typically 1-3 mm diameter and up to 250 mm long are consistently produced at any angle by Marlor using the K3HN high-speed hole drilling machine.

"The result," says Marlor's managing director Kevin Taylor, "is a world-class tool manufacturing technology that sets us apart, especially in the production of tooling for use on hard-to-machine materials that our aerospace customers, for example, are increasingly processing. Indeed, the application of internal coolant can extend the life of these tools by over 200 percent.

"This CNC machine generates savings of up to 40 percent in our hole drilling times compared with traditional 'crude' methods

largely based on manual machines, which equates to substantial reductions in lead times.

"And the consistent repeatability of hole size, pattern and angle are also all guaranteed by the high-level programming routines within the machine's Sodick Motion Control CNC system.

"In addition, the machine features automatic depth measurement which has eliminated the need for manual measuring and therefore also speeds up the manufacturing process as well as automatic electrode feed."

Importantly, when discussing the installation with machine supplier Sodi-Tech EDM, Marlor specified the inclusion of a rotary table that is indexable in 1 degree increments, to enable holes at any angle to be produced in line with the company's growing order book for the supply of special purpose tooling tools that perhaps also feature longer flutes or different corner radius.

The K3HN sits alongside a collection of nine state-of-the-art Walter Helitronic tool grinders and two Walter Helicheck tool measuring machines, plus a comprehensive range of support equipment, at Marlor's purpose-built site in Peterborough.

Marlor Tooling Ltd
Tel: 01733 404800
Email: info@marlor.co.uk
www:marlor.co.uk

Double Octomill Cassette Cutter achieves near zero axial run out

Seco Tools has recently expanded its range of face milling cutting tools to include a new innovative Double Octomill™ Cassette Cutter.

The new cassette cutters use Seco's advanced pin locating technology and high-speed steel pins to ensure fast, reliable and precise insert positioning and cassette pockets are adjustable to help virtually eliminate axial run out.

The Double Octomill Cassette Cutter incorporates Seco's patented pocket design and features cassettes that are adjustable in the Z-axis or axial direction. Inserts can be mounted and setup in cassettes separately before they are assembled into the cutter body. Each individual cassette can then be adjusted as appropriate so that all cassettes are cutting on the same plane.

This exact insert positioning allows for increased feed rates and helps deliver excellent surface finishes and increased tool life.

Cassettes are combined with new close-pitch cutter bodies that accommodate Seco's cost-effective Double Octomill inserts which are double-sided and provide

a total of 16 cutting edges ensuring productivity.

Double Octomill Cassette Cutters are available from 125 mm to 315 mm as standard. Larger sizes (up to 500 mm) can be supplied as customised solutions.

Cassettes have a modular design which means they can be changed and replaced quickly if damaged, negating the need to replace the entire cutter body.

Seco introduces two new insert sizes to its popular 335.25 range of disc milling cutters

The new additions mean that Seco's 335.35 cutters are now available in cutting widths from 13.5 mm to 32 mm. Seco's 335.25 disc milling cutters provide manufacturers with high productivity and flexibility and can perform numerous machining operations such as slotting, back facing, helical and circular interpolation and plunging.

The tools exhibit a unique cutter design and four cutting edge insert geometry that helps reduce cutting forces and optimise chip flow. The range features fixed pocket and adjustable width tools making them ideal for all types of machining environments.

Available in diameters from 80 to 315 mm, the 335.25 range includes 15 mm, 20 mm and 25 mm cutting widths for fixed pocket disc milling cutters and 13.5-mm to 32-mm cutting widths for adjustable pocket cutters.

Inserts are offered in four different sizes with corner radii ranging from 0.4 mm to 6 mm and, with a number of insert grades available, allows 335.25 tools to be used to machine all material types.

Seco Tools (UK) Ltd
Tel: 01789 764220
Email: mike.fleming@secotools.com
www.secotools.com/uk

Single drilling head replaces two other types

By popular demand, ISCAR has expanded its successful SUMOCHAM drilling head options. Introduced at EMO 2015, the revolutionary ISCAR HCP drilling heads feature an innovative geometry with concave cutting edges that substantially enhances the self-centering capability of the drill, enabling the use of long drills of up to 12 x diameter without first drilling a pilot hole.

ISCAR's advanced drilling heads are available in diameters from 8-25.9 mm, in 0.1 mm increments. By eliminating the need for a pilot hole, the new drilling heads significantly cut machining cycle times and provide substantial cost reduction by reducing the number of tools required when performing drilling operations.

The new HCP drilling heads can be mounted on any ISCAR SUMOCHAM drill body that features the appropriate pocket size.

As a single drilling head can now replace two other types and reduce the number of stock items, ISCAR HCP geometry (patent pending) in an excellent, cost-effective choice for the efficient machining of steel (ISO-P) and cast iron (ISO-K) material groups.

The high quality HCP drilling heads are made from ISCAR's IC908 TiAlN PVD nano layer coating grade and feature: increased peeling resistance; excellent wear resistance; stable and predictable wear progression; efficiency with MQL coolant; high surface quality.

Iscar Tools Ltd Tel: 0121 422 8585
Email: sales@iscar.co.uk www.iscar.co.uk

ITC expands UK production facility

As a leading UK based manufacturer of precision cutting tools, Industrial Tooling Corporation (ITC) has now expanded its Tamworth manufacturing plant. The company has acquired a neighbouring premises that will give ITC a demonstration area, additional warehousing and most importantly the space to almost double its cutting tool production capacity.

Purchased during the summer, ITC has invested heavily in the new 8,000 sq/ft floor space to create a state-of-the-art manufacturing plant. Commenting upon the acquisition and the planned expansion of the Staffordshire business, ITC's managing director, Peter Graves says: "Our business has grown substantially in the last few years and we have continued to invest in the most productive machine tools to maximise our productivity per square metre. The limited floor area was restraining our plans for growth, so the availability of the adjacent unit proved very timely."

The new 8,000 sq/ft floor area has already been prepared with a demonstration area that will also provide the R&D team with a tool trialling facility for customers. The new factory will almost double the existing floor-space and this will provide the potential for an additional 20+ machine tools for the production of cutting tools. Additionally, an annex floor has been installed to provide extra office space. Eluding to this, Peter Graves says: "We have already installed our first Rollomatic 620 grinding centre and we have a universal profile grinding centre from GSE Technology on order. These machines will provide additional capacity; and as we develop new products and extend our market reach, we will invest accordingly in the very latest technology."

The expansion marks a very exciting period for ITC, as it has recently become the UK distribution agent for the BIG KAISER brand and the indexable tooling line from Widia. Peter Graves concludes: "Combining these prestigious brands with our UK manufactured high-quality cutting tool range now gives ITC greater market reach than ever before. We now have the product lines to provide a solution for all cutting tool enquiries; and with an ongoing recruitment process, we also have expertise to support these products. The addition of new product lines produced in the UK by ITC, as well as new ranges from BIG KAISER and Widia will be underpinned by our re-grind and tool servicing department, which will now expand to enhance customer experience and minimise lead-times."

ITC is a specialist tooling supplier. The company's objective is to supply customers with the best possible products, at the same time making them more efficient by introducing productivity and method improvements. To achieve this ITC continue to invest in a team of capable and enthusiastic engineers and technical sales people, backed up by an in-house team. From solid carbide and PCD tooling, through to indexable milling, turning and boring, plus top quality tool holders, ITC has an impressive and varied product range.

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

Introducing QPlus

Four flute tools with a difference

The latest addition to Quickgrind's solid carbide tooling solutions is QPlus; a range of general purpose, off-the-shelf, four flute tools with a difference.

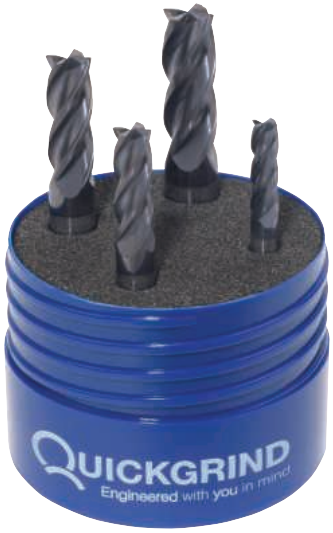
At first glance, you will see that these solid carbide performance endmills are significantly longer than most off-the-shelf tools. Look closer and you may notice their special coating. Both features maximise tool life, with the coating reducing wear and the length allowing full advantage to be gained from Quickgrind's unique remanufacturing service.

For those still unfamiliar with that process, Quickgrind technology allows tools to be remanufactured to the original quality, typically up to seven times, so customers can make savings in excess of 50 percent on tool costs while maintaining as-new performance.

The QPlus range delivers the kind of results that have gained Quickgrind an international reputation for its innovation. The new tools are designed to give customers flexibility with multiple roughing and finishing applications for a wide variety of component materials.

They are very easy to obtain, via distribution partners Alliance Tools, YMT Technologies and DHS Tools, or directly from Quickgrind. Quickgrind managing director Ross Howell says: "Customers buying now can take advantage of an introductory offer for a boxed set of four tools at diameters of 6, 8, 10 and 12 mm. The range also includes 3, 4, 5, 16 and 20 mm tools."

He adds: "Our 'total solution engineering' approach means creating the right tooling for every user, whether they need general purpose tools or something much more specialised. Our company is proud to have been built on Britain's great engineering heritage, and each new product range, like QPlus, reflects that tradition of quality and innovation. We are also committed to driving forward the competitiveness of our industry, which has much to gain from lean technologies like our tool remanufacturing process."



Quickgrind is an internationally renowned carbide cutting tool manufacturer whose unique approach and innovations make customer processes quicker, more convenient and more profitable.

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

A tap that makes a difference in cast iron machining

Sandvik Coromant unveils CoroTap 100 - KM

Sandvik Coromant has launched a new tap for use with cast iron. Designed to maximise machining productivity, CoroTap™ 100 – KM features the latest cutting edge technology and offers excellent results and process security.

With the aim of developing a tapping tool that will make a difference for all types of cast iron machining, Sandvik Coromant has increased the number of flutes to reduce the force on each cutting edge. The new flute shape helps to produce really thin and small chips, which makes CoroTap 100 - KM a perfect solution for solving chip issues in cast iron as well as in steel materials with hardness between 150 and 190 HB.

A back chamfer has been added to let the tap thread deeper, and use of a new grade offering improved hardness makes the tap more wear-resistant. Finally, thread and chamfer relief is optimised to reduce the contact between the tap and the workpiece material.

New grade provides excellent wear resistance

The new D210 grade is a combination of powder steel substrate with high hardness and titanium aluminium nitride with a multi-layer coating that has a very smooth surface. This combination gives excellent wear resistance in dry and wet machining, including minimum quantity lubrication.

When tested against a competitor product, CoroTap 100 - KM showed outstanding machining results, a secure process and a 70 percent longer tool life.

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3100 patents worldwide, employs over 8,000 staff, and is represented in 130 countries.

The new grade D210 ensures CoroTap 100 - KM delivers excellent wear resistance in dry and wet machining

Sandvik Coromant
Tel: 0121 504 5400
Email: uk.coromant@sandvik.com
www.sandvik.coromant.com/uk

Top Cut 4 indexable holemaking platform

The new Top Cut 4™ indexable drilling platform from WIDIA™ is targeted to end users that machine a broad assortment of products and need one drill for a variety of drilling applications and workpiece materials.

Expanded capabilities and improved performance combine for outstanding results in the new Top Cut 4 indexable holemaking platform from WIDIA. A true multi-problem-solver in one platform. Top Cut 4's breadth of application capabilities include through- and cross-holes, inclined entry and exit opportunity, 45° corner, half-cylindrical, concave, and chain drilling.

Four true cutting edges combined with WIDIA-grade technology results in notably higher speeds and feeds, higher metal-removal rates, and extended tool life, all of which means lower cost per edge.

"Process stability is a significant challenge and the driver behind Top Cut 4 and its development," says WIDIA product manager Vivian Pavlov. "What process stability simply means is the ability to quickly select and successfully apply a tool even in an unfamiliar or unstable condition. Users need one drill that can be applied in a variety of drilling operations and workpiece materials. Top Cut 4 addresses this challenge with cutting performance at higher speeds, which makes it the proven choice in lowest cost per edge."

Top Cut 4 periphery and centre inserts each feature proprietary cutting profiles for excellent centering capability and workpiece penetration. The inner and outer (centre and periphery) inserts are clearly differentiated for no mixups, and are available in grades for high-speed applications, high toughness demands, and high metal-removal rates in general. Specific geometries are available with such features as reinforced cutting edges and a steep chipbreaker for steel, cast iron, and short-chipping materials, or an optimised chip groove for stainless steel, long-chipping steels, and where low power consumption is required.

In addition, Top Cut 4 is featuring high-stability shanks in lengths of 2XD, 3XD, 4XD, and 5XD, in both metric and inch configurations. Diameter ranges from 12 to 68 mm (0.473 to 2.5 inches). Eight insert sizes cover the complete diameter range.

Robust cutter bodies are marked by deep helix angled flutes for efficient chip evacuation even at 5XD length. Large coolant holes mean efficient coolant delivery and extended insert life.

Moreover, Top Cut 4 is available through NOVO™, WIDIA's digital process knowledge application. With powerful process knowledge available on iPad™ and other digital devices, NOVO provides far more useful process knowledge than any online catalogue alone, all obtained in a fraction of the time.

New VariMill III ER

VariMill III ER is true finishing endmill for higher metal removal rates, longer tool life, and improved surface finishes in demanding workpiece materials such as titaniums and stainless steels

"OEMs and tier suppliers in the aerospace and energy segments who regularly face working in high-strength, low-weight titaniums and stainless steels will want to see how the VariMill III ER together with the new WIDIA Victory Grade WS15PE can improve performance," says Ron West, WIDIA product manager. A newly developed coating and proprietary pre- and post-coat treatment significantly improves cutting

edge consistency. Consistent cutting edges mean higher metal-removal rates, longer tool life, and improved workpiece surface finishes in expensive demanding materials. The tool is designed to be a true finishing endmill with the ability to take up to 30 percent radial engagement.

UK Distributor
Industrial Tooling Corporation (ITC)
Tel: 01827 304 500
Email: sales@itc-ltd.co.uk
www.itc-ltd.co.uk

Milling cutter for the highest demands

New for 2016, Fenn has launched the all-new Maykestag 'Speedtwister'. Especially developed for speed trochoidal cutting, the Speedtwister is suitable for conventional and dynamic milling strategies. With huge cutting depths of up to 5xD, high-tech coating technology and optimised tool geometry for perfect chip control, the Speedtwister provides increased productivity and profitability.

With the advances in CADCAM software and improved machining strategies, alongside the continuous concern among manufacturers to reduce cycle times and tool wear while maximising productivity, Maykestag set about developing a new product range in close cooperation with customers; thus emerged the Speedtwister. A high-speed machining product specifically tailored and individually made for customer production processes. Through innovative technology Maykestag offers new standards in trochoidal machining to optimise the metal cutting process, resulting in significantly increased customer productivity and profitability.

The Speedtwister, combined with the trochoidal milling paths of modern CADCAM systems, offers substantially increased cutting speed and feed rates as opposed to conventional slot milling applications. Capable of high-speed machining the Speedtwister produces a light, rapid cutting action resulting in increased metal removal rates and accuracy with long-term benefits. Featuring cutting lengths of 3xD and 5xD, users can effectively use the full flute length, executing a full depth of cut with an additional percentage step over on the radial cut, saving both time and money while also reducing machine load. Optimised tool geometries provides perfect chip control, smooth vibration-less running and excellent surface finishes, and with the most up to date high-tech coating the Speedtwister achieves maximum metal removal rates in both wet and dry machining.

Suitable for both roughing and finishing and offering a Universal and Inox range in both 3xD and 5xD the Speedtwister is suitable for general steels up to approx. 50 HRC as well as stainless steels, Inconel and titanium, among others.

Key features of the Speedtwister include: maximum cutting volume, high-speed machining, longest tool life, lowest heat treatment, extreme cutting parameters for the most effective productivity, optimised tool geometry for perfect chip control, huge cutting depths of up to 5xD and up-to-date high-tech coatings set new standards in chip removal

Fenn Tool Ltd
Tel: 01376 347566
Email:sales@fenntool.com
www.fenntool.com

New chip-breaker offers more choice and accuracy

Dormer Pramet aims to increase the accuracy of indexable hole-making with the launch of a versatile new chip-breaker. Suitable for machining low carbon and soft stainless steels, the SD geometry supports both Dormer Pramet's SCET and XPET ranges.

The SD (soft drilling) chip breaker has been specifically designed to provide improved stability and productivity when drilling low strength soft and long-chipping material, where the balance of forces between the inserts becomes more difficult to maintain.

Part of a wider launch of new products announced by Dormer Pramet in November 2015, the chip-breaker's positive geometry with stabiliser provides reliable chip evacuation, minimal vibration and low cutting forces. This results in a quieter and more stable machining process.

The addition means Dormer Pramet can offer a greater choice of grades, geometries and designs of inserts for indexable hole-making.

Its existing UD (universal drilling) geometry is suitable for machining most medium and high strength steels, while grades D8345, D8330 and D9335 provide a number of options for Dormer Pramet's 800D line of 2D-5D indexable drills.

Marcel Nunes, product manager for indexable hole-making at Dormer Pramet, says: "A key requirement for any indexable drilling task is accurate hole-tolerance and straightness. This is best achieved when the cutting forces on the inner and outer inserts are balanced.

"However, the cutting conditions for both inserts are typically very different. The outer insert cuts smoothly at maximum speed, while the inner insert has to work closer to zero cutting speed, shearing rather than cutting and enduring higher impact forces.

"When this in-balance gets too large the drill starts to move, deflecting it off course. This results in greater vibration and poor-hole quality, unreliable chip evacuation and reduced tool life.

"When machining low strength soft and long-chipping steel and stainless steel the balance of forces becomes even more difficult to maintain. Our new SD chip breaker has been specifically designed to provide better stability and productivity when drilling these materials."

An overview of all the new indexable ranges launched by Dormer Pramet in November 2015 is available in its latest product brochure. To order a printed copy or for more information contact your local Dormer Pramet sales office.

Dormer Pramet
Tel: 0870 850 4466
Email: simon.winstanley@dormerpramet.com
www.dormerpramet.com

EU Commissioner visits SCHUNK

Hands-on discussion of the opportunities offered by 'Industry 4.0'

How can industry use the potential of digitisation? Where are the challenges? What prerequisites have to be fulfilled? These and other questions were at the focus of a hands-on talk during a visit by EU Commissioner Günther Oettinger to SCHUNK, the competence leader for clamping technology and gripping systems in Brackenheim-Hausen, Germany.

The innovative family-owned company is considered a driving force in the machine building industry with respect to the trend toward 'Industry 4.0'. During the talk it became evident that increasing automation and digitisation can be important for the sustainability of European industry.

Since he assumed the position as EU Commissioner for Digital Economy and Society in 2014, Günther Oettinger has taken up the cause of digitisation of the economy under the concept of 'Industry 4.0'. He sees the use of smart technologies in industrial production as an important element in developing and securing the position of European industry in the global marketplace. The European Commission estimates the potential of a digital home market at €415bn Euros. In the opinion of the commission, hundreds of thousands of new jobs can be created if three conditions are fulfilled: simplified access to digital products and services, optimal conditions for digital networks and services, and intensified efforts to digitise the economy.

Networked production

Making this possible is something that became clear during Günther Oettinger's visit to the competence centre for gripping systems at SCHUNK GmbH & Co. KG. The family-owned company is a world market leader in clamping technology and gripping systems and one of the pioneers in the field of mechatronic handling. As early as 1986, the manufacturer of high technology from the federal state of Baden-Wuerttemberg had already developed an electrically controlled gripping module, long before the emergence of mechatronic handling systems. Today, with 300 standardised gripping system components, SCHUNK offers the world's largest mechatronic gripping system portfolio on the market. This portfolio includes many Industry 4.0 compatible modules that are suitable for use in networked smart factories.

The hands-on talk, conducted with the two managing partners Heinz-Dieter and Henrik A. Schunk, as well as chief technology officer Dr. Markus Klaiber and managing director Markus Kleiner, made it clear that the trend toward Industry 4.0 offers great opportunities.

"Digitisation must be pursued at the highest level and with an interdisciplinary approach," emphasised Dr. Markus Klaiber. In the complex interplay of processes in the smart factory the company focuses on the development of intelligent, networkable components that perceive their environment by means of sensors and communicate with other components, with the ability to respond individually. At the same time SCHUNK is making progress with Industry 4.0 in the automation and organisation of its own production processes. To establish and intensify digitisation within the company, SCHUNK has set up a 'Smart Factory' task force that is responsible for strategy development, interdisciplinary exchange and implementation of new business models.

Henrik Schunk explains the Industry 4.0 cell at SCHUNK

Intelligent interplay of all components

Günther Oettinger experienced what a smart factory is capable of, live in the form of a highly versatile Industry 4.0 assembly cell created by SCHUNK in cooperation with several system integrators. In the cell, pick & place units, 3-axis gantries, robots and mobile platforms autonomously cooperate in assembly, inspection, packaging and transport processes. Each single process step is monitored in detail by sensors and reported via the SAP control technology to the system controller and the company's operation control centre. Günther Oettinger was impressed by the complexity of the system and encouraged SCHUNK to continue investing its expertise and innovative spirit in the development of this technology.

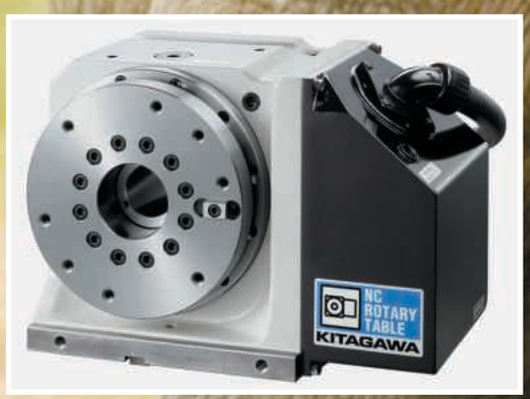
Henrik A Schunk (right) and Heinz-Dieter Schunk (centre) with EU Commissioner Günther Oettinger

SCHUNK Intec Ltd
Tel: 01908 611127
Email: info@gb.schunk.com
www.gb.schunk.com

Knockout Performance

Kitagawa rotary tables strike a blow for high performance one hit machining

- Single or multiple axis units
- Extreme positional accuracy and repeatability
- High damping force and indexing speed
- Horizontal or Vertical machining options
- Multiple brake options



Make the most of your machining resources with Kitagawa rotary tables – from 1st MTA, the UK's leading machine accessory supplier

Email: enquiries@1mta.com Freephone: 0800 783 0510
Fax: 0800 783 0517 www.1mta.com

1st MTA MACHINE TOOL ACCESSORIES

Increased productivity and process reliability

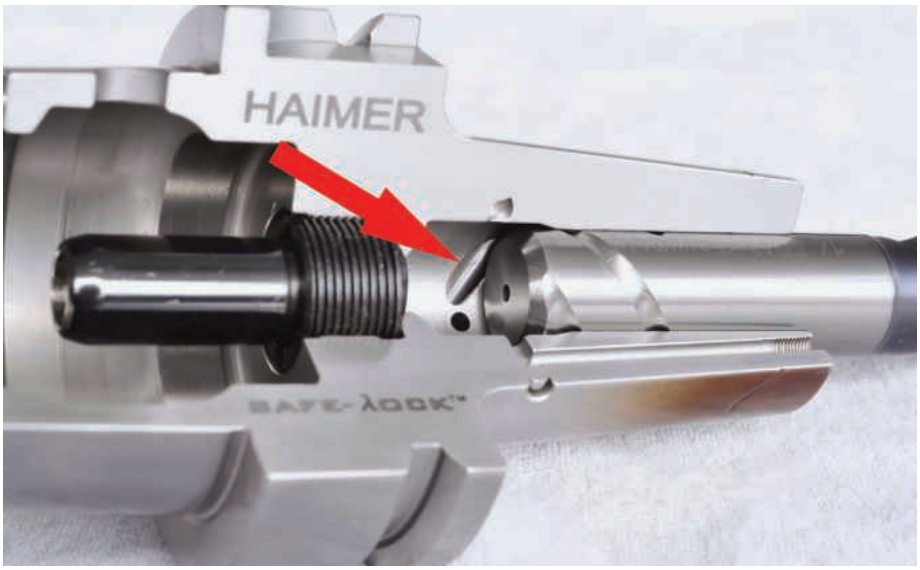
Due to the positive form and frictional clamping system made by HAIMER, MTU Aero Engines in Munich was able to increase the reliability in the process of machining difficult-to-cut materials while also decreasing processing times.

Due to Safe-Lock™-shrink fit chucks and the shrink fit machine power clamp premium NG from HAIMER, Alexander Steurer, senior manager NC-programming stator components at MTU, accomplishes heavy duty machining of high-temperature materials with excellent runout accuracy and maximum pull out protection.

MTU Aero Engines is Germany's leading engine manufacturer and an established global player in the industry. The company engages in the design, development, manufacturing and support of commercial and military aircraft engines in all thrust and power categories and stationary gas turbines. Due to HAIMER's patented Safe-Lock pull out protection system, MTU was able to optimise their machining process regarding the production of structural frames and castings.

Jet engines are high-tech products. In their production, innovative technologies and processes are used. To keep current technologically, MTU develops innovative manufacturing strategies, and if necessary obtains additional external expertise. So was the case when they contacted HAIMER, the tool holding specialists from Igenhausen, Germany, to help optimise the demanding machining process of manufacturing frames and castings.

Difficult-to-machine materials, high-quality components and the high degree of automation at MTU require a smooth and reliable machining process to maintain the highest levels of quality. In order to ensure this consistency and to control the high axial cutting forces during machining, MTU decided to implement the Safe-Lock pull out protection system by HAIMER.



In the Safe-Lock system, special drive keys in the tool holder and grooves in the tool shank prevent the cutting tool from spinning during extreme machining, thus preventing tool pull out from the chuck. In addition to the frictional clamping forces of the selected clamping system, the cutting tool is held using positive form locking in the tool holder through the constructive design of the Safe-Lock system.

Alexander Steurer, senior manager NC-programming stator components at MTU Aero Engines AG in Munich, explains the decision for the system: "Through the introduction of Safe-Lock and the shrinking technology from HAIMER, we can guarantee process reliability even with milling challenging high temperature materials. This is a prerequisite to guarantee smooth processing during manufacturing of frames and castings, given our high degree of automation "

The combination of pull-out protection and highest concentricity of the Safe-Lock system leads to low vibration and as a result, a very stable machining process. Due to the increased cutting depths and feeds, the metal removal rate can be increased significantly. And thanks to the improved runout accuracy of HAIMER shrink fit chucks, tool life is improved by up to 50 percent.

The benefits of less than 3 µm runout, that the symmetrical Safe-Lock design provides, coupled with optimum balance and the possibility for easy length presetting were substantial reasons for MTU to switch to the HAIMER system instead of continuing to use Whistle Notch or Weldon tooling systems. While these other systems do in fact prevent tool pull out, both are unsymmetrical by design, hence providing insufficient runout and balance accuracy.

Through the use of a set screw the cutting tool is wedged against the opposite wall of the clamping bore. The holder pushes the cutting tool off centre and thereby leads to excessive amounts of runout. Any such design also allows for significant radial play between the tool shank and the bore itself. That way the aforementioned holders actually push the cutting tool off centre, thereby inducing excessive amounts of runout. Hans Drahtmüller, line manager machining stator components at MTU in Munich, explains the resulting problems: "Due to the deteriorated runout, the tool life could not be fully realised. As a result, the tools with a Weldon flat had to be exchanged early. With Safe-Lock regrinding could be automated due to the cylindrical form of the system, as the cutting tools no longer have to be inserted manually into the grinding machine compared to Weldon flat tooling. This saves tool costs"

UK Agent
Carillion Industrial Services Ltd
Tel: 01480 225850
Email: sales@cis-tools.co.uk
www.cis-tools.co.uk

New Neodymium magnet range

Eclipse Magnetics has launched a new range of neodymium shallow pot magnets with a countersunk hole to accommodate screw fixings. Designed and developed by their magnetic development team, the range includes 8 standard sizes from 10 mm in diameter to 48 mm diameter. To date the new products have proved extremely popular amongst industrial supplies distributors and end user manufacturers.

Tim Hollingsworth, general sales manager for magnet materials and assemblies at Eclipse says: "The response has been excellent. We developed the range in response to demand from our major customers who were looking for a simple cost effective solution for mounting high performance magnets into closures or other holding applications. Whilst we make over 20,000 products, this was a gap in our range we have now fulfilled."

Eclipse Magnetics' countersunk neodymium shallow pot magnets are typically used in holding applications such as closing mechanisms on cabinet doors and drawers, gate latches, and door holding. Other common applications include shop fitting, where the magnets are used in shelving, lighting systems, window displays and general signage. Neodymium is the perfect material for magnets of this size because it offers high magnetic strength to magnet size ratio, ideal for applications where space is limited.

Magnetic expertise at the Southern Manufacturing & Electronics Show

Eclipse Magnetics will be attending the Southern Manufacturing and Electronics Exhibition 2016 in February. The company will be showcasing its expertise in the design and manufacture of high performance customised magnetic solutions.

The Eclipse Magnetics stand will give visitors the opportunity to find out more about its in-house magnetic expertise, which allows them to offer a full range of standard and bespoke magnetic solutions that can be integrated into existing or new customer designs.

Eclipse Magnetics have access to a range of materials to suit any application, as well as experienced engineers that can produce high precision assemblies to precise specifications. They provide high performance magnetic materials and magnetic assemblies for a variety of industrial applications, in addition to a full range of design and manufacturing services. Eclipse Magnetics also provide a range of electromagnets which are compact and lightweight whilst retaining high performance magnetic capabilities.

Eclipse Magnetics
Tel: 0114 2250600
Email: info@eclipsemagnetics.com
www.eclipsemagnetics.com

New solution compatible with Hainbuch modular

Sometimes small things turn out to be a big success. In fact the overwhelming success of the Hainbuch mini chucks has now driven the company's engineers to make them compatible with the Hainbuch modular system.

Hainbuch has now engineered a solution that makes its mini chucks compatible with both series of chucks, the round Spanntop and the hexagonal profile Toplus. With its reduced interference contour, to use the modular system with the Spanntop mini chuck requires an adapter ring. Whereas the existing Mando Adapt mandrel and jaw module work perfectly with the new Spanntop mini, the Toplus version does not use an adapter ring, instead it has a ring of attachment holes for fixing the jaw module. From 2016, this series will get its own Mando Adapt series of adapters. In addition, the Spanntop and Toplus minis both have full through-bore facility and they are available in three standard lengths to suit all machines and drawtubes.

Reduced clamping device interference contour and less mass

These two factors play an ever more important role in any machining process. Tool accessibility and low energy consumption are key criteria for modern workholding. So, this makes them ready for the challenges of the future. Increasingly parts have smaller dimensions and higher tolerances than in the past, so the emphasis is no longer on the chuck size but rather on the complete process.

Thanks to greater tool accessibility, the mini chucks can use shorter and more stable tools on the main and counter spindles. This has a direct influence on the surface finish. Not only is the mass reduced by over 38 percent, the chuck diameter and the total length has also been considerably reduced by over 25 percent. So, the "little" chucks make a "big" difference. The reduced interference contour makes it easier to choose the right tool and this helps with the issue of reduced space especially in counter spindle machines. The reduced mass also results in lower energy consumption especially in mass production. Furthermore, with spindle acceleration and deceleration being more dynamic, cycle times are shortened and all this contributes to lowering the cost per workpiece.

Hainbuch UK
Tel. 01543 478710
Email: nick.peter@hainbuch.co.uk
www.hainbuch.com

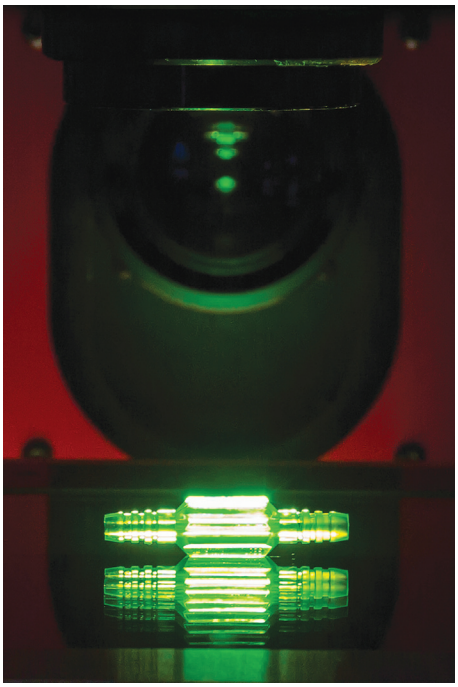
Cost-effective measurement and inspection

Designed to offer an accurate, cost-effective method of measuring and inspecting small components, the recently launched Starrett VB300 is a compact profile projector that has a number of advanced features. The vertical benchtop optical system features a 300 mm (12 inch) diameter screen that can be fully viewed to the edge, with crosshairs, calibrations marks and overlay clips it is ideal for the rapid inspection of small components.

Marketing manager, John Cove says: "Although the Starrett VB300 has been designed to meet a price break point at around the current market cost for a comparable system, it has been done without compromising quality or functionality."

With an integrated hood, the Starrett VB300 features an all-metal construction for rigidity, accuracy and longevity. Flat parts up to 5 kg can be accommodated on the 225 mm by 225 mm precision workstage top, which features a 155 mm by 155 mm toughened glass insert and 100 mm by 100 mm of high resolution measurement travel. A manual focus range of 100 mm ensures every detail of the component being measured remains in sharp relief.

Engineers, technicians and operators can simply 'plug and play' the new VB300, which comes as standard with an integral DRO system that allows X and Y linear axis measurements and angular measurements to be made on the screen and read off the LED display located just below. Linear positional feedback comes from precision glass scales with a resolution of 0.001 mm, while the digital protractor provides a resolution of 1 minute.



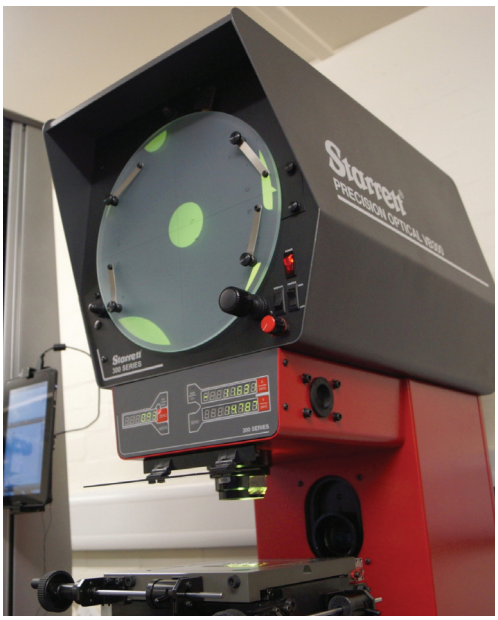
Optionally, customers can upgrade to Heidenhain or Metlogix geometric measurement systems with increased measurement functionality offered, such as edge detection, to match the application. These systems support the functions of measuring, recording, analysing and reporting dimensional data to fully support the inspection and measurement process.

Able to measure a wide range of component sizes the VB300 has a quick-action bayonet fitting single lens mount that can accept a variety of optional precision ground magnification lenses, including 10 x, 20 x, 25 x, 50 x and 100 x, that take just seconds to change over.

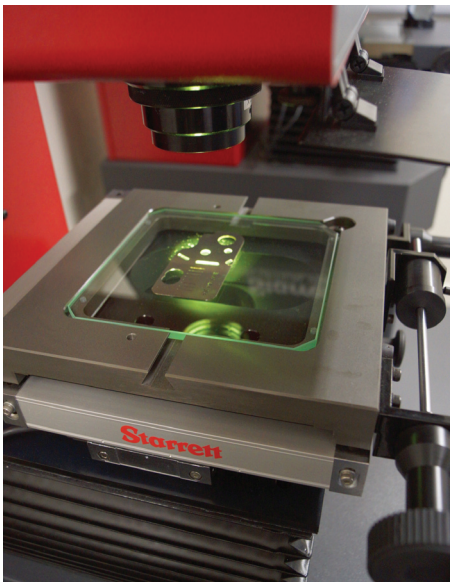
Surface and profile illumination comes from Starrett's newly developed LED source that not only improves the level and quality of lighting available, but also significantly reduces the heat soak created by traditional tungsten halogen lamps. The robust design of the solid-state LED source also has a predicted service life of more than 5 years, compared to the annual replacement required for tungsten halogen lamps. Energy consumption is dramatically reduced, providing further benefit to the user, and to the environment in general.

"Optical projectors provide a time tested, cost-effective, solution for non-contact measurement. They are simple to use, yet have great capacity and performance to satisfy an exceptionally wide range of dimensional inspection applications and complex measuring requirements," states Brian McLay, Starrett Precision optical metrology business manager.

"At the heart of these systems are precision optics, superb LED based, low consumption, environmentally friendly lighting, and a highly accurate workstage which combine to ensure bright, sharp images and exceptional accuracy. Our vertical systems are ideal when the parts to be measured are flexible or soft, such as plastics, thin stampings or electrical components, that can be placed on the glass insert of the workstage."



The L. S. Starrett Company is a global business, headquartered in Athol, Massachusetts, but with production facilities in North and South America, the UK and China. Starrett optical and video measuring



products are supplied exclusively in the UK market by Optimax Imaging, Inspection and Measurement.

The L. S. Starrett Company Ltd
Tel: 01835 863501
Email: jcove@starrett.co.uk
www.starrett.co.uk

GLOBAL EVO

Fast. Faster. Fastest.

Driven by technology

Offering accurate high-speed scanning to enable faster manufacturing throughput, the Hexagon Manufacturing Intelligence GLOBAL EVO coordinate measuring machine is driven by technology. GLOBAL EVO comes with Compass and Scan Pilot technologies as standard, reducing vibration and ensuring robust and reliable tactile scanning to guide the machine to revolutionary performance and unprecedented speed.

HexagonMI.com

Visit us and get a demonstration at
MACH 2016
HALL 5, STAND 5710

HEXAGON
MANUFACTURING INTELLIGENCE

Vestas generates the power of precision

FARO laser trackers high-precision measuring technology

In the world of wind turbines, size and shape matters. The longer its turbine blades, the more energy a turbine can capture from the wind and the greater its electricity generating capacity. In addition to size, the efficiency of a wind turbine blade is determined by the precision of its airfoil profile, a shape similar to that of an aeroplane wing.

Given the potential difficulties related to the critical measurement of the world's largest blades, used on the record breaking V164-8.0 MW turbines, MHI Vestas Offshore Wind selected FARO laser trackers as its preferred large-volume, high-precision measuring technology.

Despite the impressive scale (80 m - almost as long as a football field) of the V164-8.0 MW turbines blades, the advanced FARO instruments are able to quickly and accurately measure aerodynamic profiles and a wide range of other critical blade features.

MHI Vestas Offshore Wind is a joint venture between Vestas Wind Systems A/S and Mitsubishi Heavy Industries (MHI). The company's sole focus is to design, manufacture, install and service wind turbines for the offshore wind industry. The company aims to drive down the cost of energy from offshore wind parks through reducing the costs and increasing efficiency.

MHI Vestas' V164-8.0 MW prototype turbine broke the record for power production by a wind turbine in a 24 hour period from 6th-7th October 2014. The turbine produced 192,000 kW/h during steady wind conditions. The power produced by the turbine in one day was enough to supply the energy needs of approximately 13,500 households.

Encouraged by the outstanding efficiency of the world's most powerful wind turbines, MHI Vestas Offshore Wind has invested in upgrading the production hall at the Vestas Blades Technology Centre, to enable serial production of the V164-8.0 MW. The impressive Isle of Wight, UK facility was specifically designed to develop large blades for the latest wind turbines.

DONG Energy recently placed the first commercial order for the record breaking wind turbines, 32 of the V164-8.0 MW turbines will be installed on the 258 MW Burbo Bank Extension project, located off the coast in Liverpool Bay. When commissioned the 32 turbines will produce enough energy to meet the electricity requirements of approximately 180,000 homes.

John Hodgkins Vestas Metrology engineer explains: "The blades for the V164-8.0 MW prototype were designed, manufactured and tested at our world-class Isle of Wight facility. As we have developed the necessary advanced processes and related skills to manufacture the world's largest wind turbine blades we are now ramping up to serial production.

"Given the sheer size and demanding dimensional tolerances of the blades we now produce, one of the most important advanced capabilities we have developed is our precision measuring expertise.

"The precise dimensions and profile of blades is critical to their operating characteristics, also it is important to ensure the correct depth of composite material to optimum blade strength without adding the unnecessary weight that could have a detrimental effect on performance.

"Traditionally we used manual measuring systems such as wooden templates and hard gauging. While these methods provided the required accuracy for smaller blades, we needed a more precise, repeatable means of gathering traceable data on larger blades.

"Even though we were recommended to look at FARO products by existing users to help improve our measuring capability, we also considered other systems. Having attended a major UK exhibition, we were able to observe demonstrations and compare the suitability of each available system. Whilst at the exhibition, we considered that the FARO Laser Tracker ION outperformed the other systems, in terms of accuracy and ease of use and believed it to be the perfect system for our use.

"Although the Laser Tracker ION was more straightforward to use and faster than the other systems that we looked at, it provided the required high-accuracy results that we needed and presented its findings in an easy to follow graphic format. After further in-house demonstrations on typical blade applications confirmed our opinions, we were happy to place an order.

"As the use of our Laser Tracker ION had delivered many advantages in terms of accuracy and speed, as our volume of work grew, on the launch of FARO's Laser Tracker Vantage, we also invested in two of the advanced new units.

"Our implementation of FARO Laser Tracker technology represented a step-change in our measuring technology. The use of FARO products has allowed us to develop highly efficient metrology methods, the equipment's speed and accuracy provides us with invaluable traceable data.''

As a result of its high accuracy specification, large measurement range, and advanced features such as MultiView cameras, SmartFind target detection and TruADM, the FARO Laser Tracker Vantage enables users to build products, optimise processes, and deliver solutions by measuring quickly, simply and precisely. The Laser Tracker Vantage, is a portable coordinate measuring machine that is water and dust resistant rated to IP52, making it ideal for use across large sites.

Customers around the world trust the FARO Laser Trackers to solve everyday measurement challenges and to resolve the most complex dimensional and form related problems that were not previously possible. Through the use of FARO Laser Trackers, companies are receiving accurate, consistent, and reportable measurement data. This enables jobs to be completed faster, downtime to be reduced, product improvement initiatives to be accelerated and the elimination of costly scrap.

FARO Technologies UK Ltd
Tel: 024 76 217690
Email: uk@faroeurope.com
www.faro.com

Mitutoyo

Providing **world-class** metrology products, services and solutions

With over 80 years' experience and representation in over 100 countries, Mitutoyo are recognised as the world's foremost manufacturer of precision measuring equipment and a provider of related services.

Visit us online at www.mitutoyo.co.uk

Come and see us at ...

SOUTHERN 16 Manufacturing & Electronics

FIVE | Farnborough | Hants | GU14 6XL

9th to 11th February 2016







City & Guilds Approved Centre

EXCLUSIVE DIMENSIONAL METROLOGY QUALIFICATION

Mitutoyo alongside City & Guilds exclusively offer the first National Qualification in Dimensional Metrology

Find out more, or book your place at ***www.mitutoyo.co.uk/education***

Rega amplifies its quality

Rega Research Ltd manufactures high-end audio equipment including award winning turntables, renowned throughout industry for superior quality. As technology evolves and precision becomes crucial to manufacturing success, Rega Research has invested in Vision Engineering's inspection and measurement solutions, making sure the equipment continues to project its acclaimed acoustic excellence.

Rega Research manufactures precision turntables, tonearms, integrated amplifiers, CD players, loud speakers and accessories. Founded in 1973, Rega Research sees itself as precision engineers of manufacturing high-end audio equipment.

In addition to producing over 2,000 turntables per month at its design and manufacture facility, Rega is also an OEM supplier of numerous arms on audiophile turntables. Now exporting to over 12 countries including Germany, Denmark, and France, Rega Research continues to invest heavily in R&D.

For Rega Research to have such devoted followers, precision is essential, and as owner Roy Gandy explains: "We see ourselves as a precision-engineering manufacturing company" With a clear understanding of the importance of precision in manufacturing, Rega Research invest in the latest equipment to ensure its turntables meet with the highest quality standards such as inspection and measuring solutions from Vision Engineering.

Investments in video inspection pays for itself

Utilising the latest technology in inspection, Rega Research employ a range of solutions to solve different challenges, drawing on the inspection solutions from Vision Engineering to inspect components such as magnet holders, screw adjusters, pivot pads, stylus guards, cantilevers, and copper wire which is 0.018 mm in diameter.

In order to visually inspect the range of precision parts Rega utilises the VisionZ2 and Makrolite video inspection systems which help to inspect the quality of the component. They have paid for themselves in one week, according to Simon Webster, sales & marketing co-ordinator, Rega Research: "Most of our suppliers are trusted suppliers who we have been working with for many years but it is always good to batch check samples as they arrive. On this particular occasion we had only just purchased the Makrolite inspection system and noticed a fault with one of our bought-in components. If it had not been picked up when it did and had been processed to the final stage of assembly, it would have been very expensive to correct because of the labour costs".

Not only do Rega Research utilise the inspection systems for quality control of supplied components, they are also utilised for part of the manufacturing process where Apheta moving coil cartridges are meticulously hand assembled using Vision Engineering's inspection microscopes, each iron cross has the coils wound by hand on our purpose built winding jig.

Each process takes extreme levels of concentration and skill and only a handful of people ever achieve the required dexterity to successfully build such a complex assembly. Using the inspection systems in this way has transformed the way they work.

Measurement and quality control

Measurement for quality control and inspection has enabled Rega Research to strive towards continual improvement in the manufacturing process. The Swift 2-axis video measuring system from Vision Engineering is used for both high magnification inspection and 2D measurement.

The copper coil or wire is weaved around a cross and it is essential the cross is free of burrs before this vital process is started. The crosses are batch inspected at high magnification to check they are burr free before the labour intensive process of winding is started. This is another preventative measure, potentially saving thousands in man hours if the parts are not up to specification standards.

Primarily used for non-contact measurement, the Swift video system is utilised for measuring a catalogue of components including the stylus tip.

Rega Research places a large amount of trust in suppliers, and since using the Swift metrology system they can say with absolute certainty whether a component is out of tolerance and does not meet requirements. Simon Webster concludes "We now have a catalogue of measurements of each part so they can be checked for accuracy, if just one measurement is not within stipulated tolerance it can have a huge impact on the way the finished turntable sounds, and even stop it working altogether. There is no room for error"

Vision Engineering Ltd
Tel: 01483 248300
Email: generalinfo@visioneng.com
www.visioneng.com

Portable non-contact tool measuring system

Introduced at the recent EMO exhibition in Milan, BIG KAISER has now announced the arrival of its new Dyna Line Portable. This portable non-contact tool measuring system that delivers the industry's highest levels of accuracy is now available in the UK from Industrial Tooling Corporation (ITC).

The new Dyna Line Portable uses a linear image measuring system that is based on CMOS sensors with tiny 1.4 m pixels. This enables the innovative new technology to work to an indicating resolution of just 1 m. This enables the Dyna Line Portable to measure a cutting tool diameter and total indicated runout (TIR) more precisely than laser-dot measurement systems.

The new system can measure tools in the diameter range of 0.1 mm to 50 mm, using offsets for dimensions over 4 mm. Capable of measuring tools at rotation speeds of up to 400 m/min, the Dyna Line Portable is based on optical, non-contact operation that avoids the risk of damage to delicate tools. When determining TIR, it can easily measure tools with an odd number of teeth, up to nine flutes.

Measuring only 232 by 132 mm, the system is completely portable and can easily be carried around to measure tools on different machines. It can be used with six C-cell batteries that will provide up to five hours of portable operation. Furthermore, it has a built-in eco mode that reduces power consumption to maximise battery life. The Dyna Line Portable available from ITC, has a clear, easy-to-use electronic control panel. For safety, a timer can start measurement at a pre-programmed interval of up to 999 seconds after shutting the machine door and starting tool rotation.

"By applying CMOS image sensor technology, we have been able to achieve industry leading levels of accuracy with Dyna Line Portable without sacrificing portability or ease of use," says Peter Elmer, CEO of BIG KAISER.

For further information on the exciting new measurement system that was launched at EMO Milan 2015, contact your local ITC representative.

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

Next generation of industrial gauging

Perceptron Inc. has launched the AutoScan® Collaborative RoboGauge™ (Patent Pending) that extends further its family of next generation industrial gauging products to include fully-automated robotic 3D scanning for dimensional measurement and gauging applications on the manufacturing floor. AutoScan Collaborative RoboGauge, combines traditional industrial Fanuc® robot technology and Perceptron's revolutionary Helix® smart scanning sensor, integrated with an innovative collaborative robot safety solution as a standardised gauging package.

Jeff Armstrong, president of Perceptron says: "The AutoScan Collaborative RoboGauge harnesses Perceptron's automated in-line and near-line measurement expertise in the automotive industry and is specifically targeted to automate a wide range of production gauging processes offering a flexible and cost-effective alternative to traditional "hard-gauges" utilising proven industrial robot technology in a collaborative safety manner negating the need for traditional robot safety fences. The RoboGauge Cell

includes a rigid machine base for holding both Robot and part fixture with translucent side panels that light up to provide visual color status indication. The RoboGauge perimeter is monitored utilising integrated Guardmaster SafeZone® laser scanners which use the diffused reflection of emitted infrared laser light to create a two-dimensional programmable detection safety field that determines intrusion within the defined programmable

The AutoScan Collaborative RoboGauge provides a highly flexible automated shopfloor metrology solution capable of handling a wide variety of parts including sheet metal, fabrications, molded parts and castings, and can be used in comparative or absolute inspection mode. The Perceptron shop-hardened Vector® software ensures no in-depth metrology expertise is required to operate the RoboGauge and provides real-time status monitoring, SPC reporting, Visual Fixturing™ alignment, and AutoSolve® feature extraction comparison to CAD. RoboGauge is also available with temperature compensation. The Helix 3D smart scanning sensor incorporates a state-of-the-art MEMS device allowing laser line quantity, density, length and orientation characteristics to be programmable and eliminates the need for the robot to physically move the Helix sensor over the part while scanning; its capabilities also allows scanning of multiple features in a single sensor position providing fast and precise measurement of complex part geometries.

Perceptron Metrology UK Ltd
Tel: 0121 6297794
Email: uk@perceptron.com
www.perception-metrology.co.uk

Ensure accuracy with the Ultima bore gauge set

Bowers Group has supplied Pact Engineering Ltd with an Ultima bore gauge set to aid them in the precision measurement of setting masters used in the manufacture of automotive components.

The Luton based company supply the setting masters to automotive customers, and it is of the utmost importance that the masters supplied are the exact sizing replicas of the finished components. In order to achieve this accuracy, the components have to be precision ground from D2 tool steel hardened to 62 Rc using Pact Engineering Ltd's Studer S30 CNC Grinding Machine. Accepted tolerances for the setting masters are extremely tight, with limits held at + - 0.001 Micron on length and diameter.

Every component that is then manufactured by the customer needs to be checked to ensure that it conforms to drawing tolerances, and the setting master provided by Pact Engineering Ltd. Any differences in size between the manufactured component and the setting master would result in the rejection of the component. The accurate manufacture of the setting masters is, therefore, absolutely crucial to the entire process of component manufacture in order to ensure that they meet the exact, very limited, tolerances required by the automotive customer.

When making the setting masters, Pact Engineering Ltd had to be sure that their sizing was correct and conformed to the international UKAS standard. In order to do so, bespoke setting rings were made to set the gauges with, ensuring accuracy every time. These setting rings then had to be sent away to be checked by an external calibration company and issued with a UKAS Certificate.

Pact Engineering Ltd now ensure the correct measurement of their setting rings using a variety of different sizing methods, including the Bowers Ultima 20-50 set, and a CNC CMM Aberlink coordinate measuring system. The Ultima 20-50 from Bowers Group is the perfect instrument for the accurate confirmation of the diameter due to its simple lever operation and constant measuring force, ensuring ease of use and repeatability.

Once the setting masters are complete, they are checked to an even higher level using a ZEISS CNC coordinate machine by Pact Engineering's customer. Since the introduction of the Bowers Ultima into the process, the components have passed the rigid tolerance tests with flying colours. As the value of six setting masters is approximately £15,000, Pact Engineering Ltd is incredibly pleased with the results.

Managing director Steve Banfield says: "Here at Pact Engineering Ltd, we pride ourselves on being able to provide precision component manufacture to the very highest level. I am sure that some companies would steer away from these challenging limits; but we thrive on being able to achieve the near unachievable."

Based in Bedfordshire, Pact Engineering Ltd offers a wide range of modern subcontract engineering services. The company prides itself on its state of the art equipment and highly skilled workforce, which enables it to supply complex components and products that meet extremely close tolerances. In addition to machining complex components for the automotive industry, Pact Engineering Ltd also specialises in the following key industries; aerospace, Formula 1, gas and water pump industries, pharmaceutical, medical and special purpose food handling sectors.

Bowers Group
Tel: 08708 509050
Email: new@bowers.co.uk
www.bowers.co.uk

A 'vision for the future'

Teledyne Labtech Ltd is one of the world's leading manufacturers of RF & microwave circuit solutions. The company's high-quality microwave circuits can be found in many demanding applications including defence electronics, air traffic control systems, global telecommunications and satellite communications systems.

Based in Presteigne, Mid-Wales, Teledyne Labtech's impressive, hi-tech manufacturing centre boasts one of the most comprehensively equipped, printed circuit board (PCB) fabrication shops in Europe. In addition to other specialised plant, the company operates 16 vertical machining centres. The flexible machines have been modified to allow the precise drilling, cutting and routing of, not only standard PCBs, but also Metalbacked PCBs.

Teledyne Labtech has gained considerable technical knowledge and extensive manufacturing experience in the production of complex microwave PCBs, from double-sided PTFE, Mixed Dielectric Multilayer PCBs, through to complex metal-cored PCBs. The company also offers plated through holes (PTH), blind and buried vias, laser cut cavities, embedded resistors and connectors.

The sheer complexity and exacting dimensional tolerances of these intricate circuits, together with the inherent material instability of the PTFE laminates in particular, necessitates the use of thorough in-process quality checks throughout each stage of manufacture. On completion, each of the company's PCBs undergoes meticulous, high-precision final inspection. As rising production levels and ever tighter customer demanded tolerances recently began to place a strain on the company's existing inspection equipment, a search was made for a fast throughput, high-accuracy, non-contact measuring system that would remove the possibility of inspection bottlenecks.

Dick Heinrich, site director, Teledyne Labtech Ltd says: "Teledyne Labtech's Presteigne facility is dedicated to excellence in microwave circuit board manufacturing, assembly and testing. Our goal is to reliably produce specification compliant products for our customers by designing and building quality into all aspects of our business. Also, we are steadfast in our commitment to meeting customer time-to-market and time-to-volume requirements.

"We strive to achieve our objectives with the help of our ISO9001 accredited integrated quality management system, that embraces advanced quality planning and continuous process monitoring.

"As rising global demand for our microwave circuit solutions had started to place a strain on our final inspection department, it became clear that we needed to source a highly accurate, non-contact measuring technology that could keep pace with our increased output.

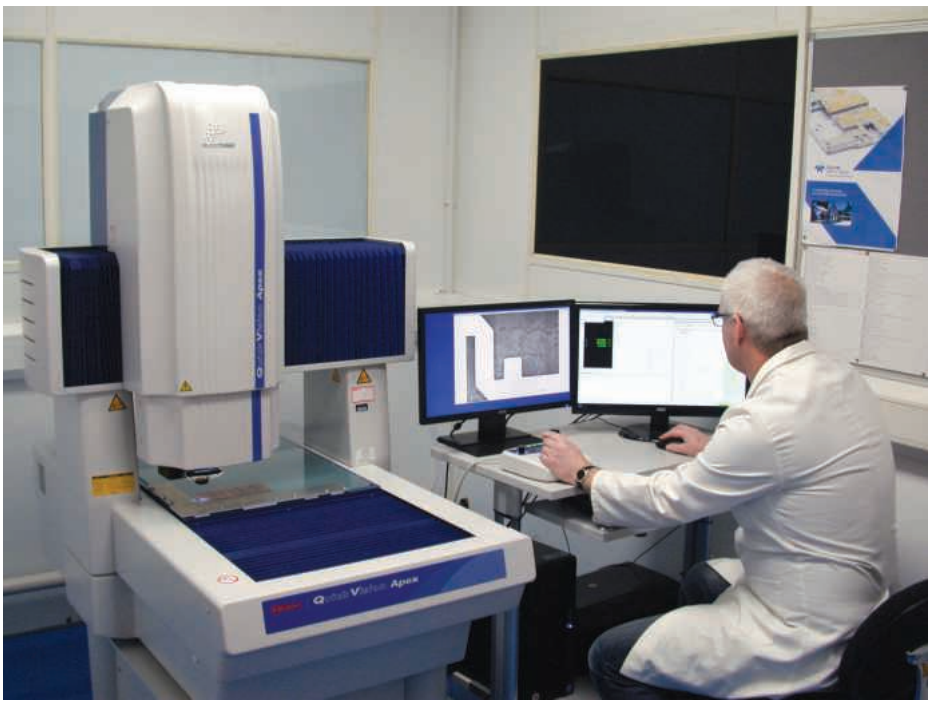
"Given the technical developments in the field of non-contact metrology, we compiled a list of system requirements that would not only solve our inspection capacity problem, but also further enhance our capability. Having approached our existing vision measuring systems supplier with a challenging system specification, the company was unable to meet our demanding requirements.

"After briefly considering a couple of alternative systems that were able to satisfy most of our needs, we concluded that the advanced Quick Vision non-contact system from Mitutoyo ticked all of our boxes and also provided a range of additional, extremely useful features that we had not specified. To confirm the machine's suitability, armed with several of our more complex PCBs, we conducted a thorough trial of its capabilities at Mitutoyo's Coventry technical centre.

"Not only were we very impressed with the ease and speed of generating programs related to the PCBs that we had brought along, the speed of the resulting inspection routines that took place in fully-automatic CNC modes and the precision of the machine's results, convinced us that we had found the ideal answer to our needs.

"After taking delivery of an Apex Pro variant of the Quick Vision machine, to ensure that our new Mitutoyo system was put into operation quickly, we had two lead users trained at Mitutoyo's Coventry facility, they also received in-house training. As our lead users have quickly become proficient in the Quick Vision's operation and adept at creating programs that we are able to run in fully automatic modes, to date, they have been able to train a further four colleagues in the machine's operation, and to use the pre-written programs.

"We currently use the system on a day-shift basis. However at peak times, such as month-end, we extend its hours of operation. Since its installation, in addition to delivering the required levels of accuracy and consistency, the machine has considerably improved our inspection throughput speed. We expect our inspection times to reduce further as we gain experience and continue to develop

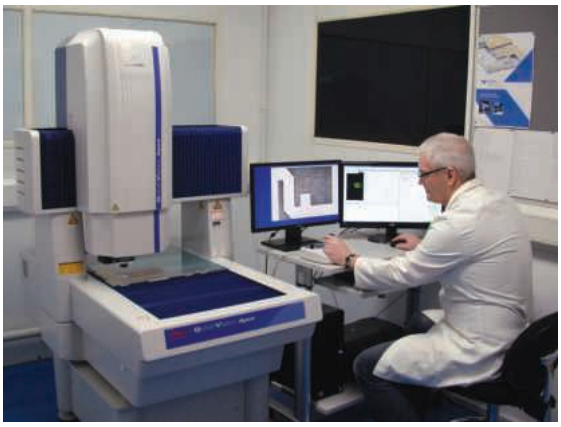


new, more efficient programs. To this end, we are beginning to investigate the possibility of loading multiple circuits onto the machine's bed.

"Our operators particularly appreciate the Quick Vision's useful backlighting feature, that allows us to accurately measure track features immediately above the substrate (heel of a track), and its ability to automatically record inspection data. We intend to use the inspection data to provide a useful feedback loop to the corresponding manufacturing process steps to adjust specific settings that would allow yield improvements of the process.

"Given the Quick Vision Apex Pro's speed of measurement and accuracy specification, we regard it as a 'future-proof' investment, in that it is capable of handling our anticipated inspection volumes and precision requirement for the foreseeable future

Mitutoyo's Quick Vision Series is an advanced non-contact dimension measurement system that uses a CCD (charge-coupled device) camera to take images that are magnified by a high-quality optical lens. The edges of the workpiece under inspection are then detected by the use of advanced image processing technology. Structural deformation caused by movement along each axis is minimised, ensuring that the innovative Quick Vision machines can be used to perform highly accurate measurements with minimal spatial coordinate distortions.



With sophisticated edge detection capabilities, an illumination wizard and advanced, user-friendly software the Quick Vision machines satisfy the demands of high accuracy, ease of use and outstanding performance. The series boasts a comprehensive line-up, ranging from compact to large-capacity models, with accuracy specifications suitable for general-purpose measurement, through to extremely high precision options.

The Quick Vision Apex Pro variant, as purchased by Teledyne Labtech Ltd, is a high-quality 3D CNC vision measuring system that provides superb accuracy and high levels of functionality. To enable optimum rigidity, the Quick Vision Apex Pro is based on a fixed bridge, moving table design. Programmable ring lighting offers excellent adaptability in lighting direction, angle and intensity, whatever the angle of the workpiece surface. This illumination flexibility enables maximum surface contrasts to be realised, resulting in the best possible imaging resolution and accuracy, whilst a programmable power turret provides control of magnification for optimal viewing.

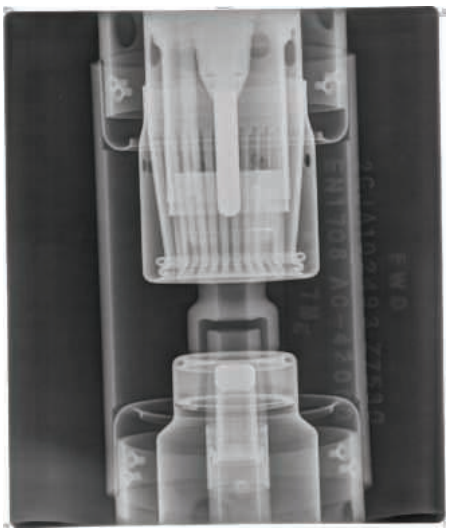
Mitutoyo UK
Tel: 01264 353123
Email: philip.fisher@mitutoyo.co.uk
www.mitutoyo.co.uk

Computed Radiography saves time and money on HV switchgear inspection

ABB's UK Service Team is now offering an advanced x-ray technique that takes non-invasive inspection of critical power network assets to the next level. Known as Computed Radiography (CR), this technique makes it possible for service engineers to see inside high-voltage (HV) switchgear without having to disassemble it, reducing outages from days to hours. In many cases switchgear can remain live and even in service while the inspection takes place.

The importance of HV switchgear in electrical networks requires utilities and industry to carry out regular inspections to avoid the risk of unexpected malfunctions and loss of supply. At the same time, detailed knowledge of its internal condition helps the effective planning of maintenance and replacement schedules.

CR provides a leap forward in technology that enables digital x-ray images to be produced without the use of expensive and delicate film. The process uses the same x-ray source as for film (x-ray tube, Iridium or Cobalt, Linear Accelerator and so on) and the image is captured on a flexible, re-usable sheet coated with a phosphor



material called an imaging plate. Following exposure, the plate is scanned by laser to secure a permanent non- degrading digital image. This image can be enhanced, filtered, annotated, zoomed, scaled, shared and stored.

The CR setup is assembled around the equipment, eliminating the need to disassemble or move it. The reusable plate is normally attached to the switchgear and a reference object is arranged in the same plane to provide scale. To protect workers from radiation, the area is evacuated during the exposure. After exposure, the screen is scanned and subsequently cleaned for reuse. No latent radiation remains after the process, all equipment and areas are completely safe for immediate access.

A major advantage of CR is that no darkroom, water or chemicals are required and the equipment only requires a standard low voltage power supply. This makes the inspection easier to perform on site as well as offering a significant reduction in time and cost per exposure. The image processing time is decreased from over eight minutes to less than one minute. The digital image on a high resolution screen can be interpreted, marked and annotated using mouse/keyboard instead of a grease pencil.

ABB Power Products & Power Systems Divisions UK
Tel: 01785 825050
Email: karen.strong@gb.abb.com
www.abb.com

Mastercam integrates Adveon tool library

CNC Software, Inc. and Sandvik Coromant has announced that they will be working together to integrate the Adveon tool library with Mastercam®. Adveon will help Mastercam users to further improve machining productivity and security, and save time during machine setup. By reducing the engineer's input, both consistency and quality of data are improved.

CNC Software's Mastercam is the world's most widely used CADCAM software, providing solutions from the simplest to the most complex design and machining problems. Mastercam incorporates state-of-the-art dynamic motion technology for milling and turning machining, providing dramatic improvements in manufacturing efficiency with reduced cycle times and ensuring increased tool life.

Adveon has standardised methodology, designed specifically to facilitate quick and safe CAM programming, allowing users to: develop their own tool library / database; select tools for production; oversee and maintain the assortment; build tool assemblies quickly and safely; see immediate results in 2D and 3D models; instantly export to Mastercam Tool Manager

Adveon works with any tooling supplier that bases their catalogue on ISO 13399, thus assuring the accuracy of geometrical information.

The advantages of Adveon are far reaching. The open catalogue area allows drastic reduction of time spent on finding and defining cutting tools, eliminating the need to search for information in catalogues or interpret data from one system to another. This in turn helps the manufacturer gain rapid access to the required cutting tool information in order to source the most suitable machining solution paired with the most efficient cutting tool selection. Through Adveon, users can select the tools used in their daily operations, maintain and amend the assortment and create their own tool libraries by copying and pasting from the catalogue area. Virtual tools can be assembled in a fast and secure manner and data can be quickly exported for CAM programming and simulation.

According to previous customer studies, the automated input of cutting tool data to CNC systems can increase the productivity of NC programming through CAM systems by as much as 20 percent.

Assemble standard tool data from any supplier with Adveon Tool Library. Adveon will be fully integrated with Mastercam

Adir Zonta, Adveon product manager at Sandvik Coromant says: "Our partnership with CNC Software creates a great opportunity for Mastercam users to increase their productivity and quality on NC programing by providing qualified tool assembly data and true to scale 3D models to Tool Manager Library. Additionally, we are able to provide the digital manufacturing world our metal cutting competence."

David Boucher, director of product development at CNC Software says: "By partnering with Sandvik Coromant, we will be able to directly use ISO13399 tooling data and models inside the Mastercam application and this will improve our mutual customers' workflow and efficiency, while reducing the potential for programming errors from the need to duplicate tooling information."

The Adveon tool library solution is the first pure ISO13399 application directly connected to CAM software. Adveon reads and consumes ISO13399 data from any tool vendor.

Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3100 patents worldwide, employs over 8,000 staff, and is represented in 130 countries.

CNC Software Inc is the developer of Mastercam and provides state-of-the-art software tools for CADCAM manufacturing to meet customer needs for simple to complex design and to solve machining problems. Mastercam is the world's most widely used CADCAM software with more than 211,000 installed seats worldwide (reported by CIMdata, Inc). Mastercam is distributed through a global network of more than 400 resellers providing software solutions and exceptional support services.

Sandvik Coromant
Tel: 0121 504 5400
Email: uk.coromant@sandvik.com
www.sandvik.coromant.com

SmartCAM v2016 includes user interface and milling improvements

SmartCAMcnc has announced the release of SmartCAM® v2016. SmartCAM v2016 delivers a substantially updated Knowledge-Base Machining (KBM) Library, as well as improvements to the user interface and to the core milling functionality.

The SmartCAM Computer-Aided Manufacturing (CAM) software family consists of applications for Computer-Numerical Control (CNC) milling, turning, fabrication and wire EDM.

SmartCAM v2016 builds on the KBM Library functionality introduced in SmartCAM v2015. The improved KBM library supports the storing and re-use of tooling and operation settings, greatly increasing the efficiency with which new programs can be created using proven and repeatable processes. This ensures consistent and accurate CNC methodologies are used throughout the manufacturing facility.

The associativity feature of the KBM Library allows jobs that use library definitions to be quickly updated to the most current definitions.

Several improvements to the SmartCAM

v2016 user interface have been included to make SmartCAM even easier and more intuitive to learn and use. The SmartCAM List View, a key component of the interface, now displays model data in a "tree structure" that is expandable and collapsible. CAD and CAM model elements can now be shown using this hierarchical list, which is convenient for viewing as much or as little detail of the model as needed.

A number of improvements have been made to the SmartCAM mill roughing processes. The Group Pocket process now supports separate pocket and island groups, including support for multi-level nested pockets and islands. Also added to Group Pocket, the Part Offset and Morph-path type options can be used to produce smoothed, continuously-tangent toolpaths that are suitable for high speed milling (HSM) techniques.

All SmartCAM v2016 products benefit from an updated ACIS® modeling kernel, and many customer requested core improvements have been added.

"SmartCAM v2016 has made important advances in several key areas that will help users be more productive. The enhanced KBM library and its integration into the product greatly improves the ease with which proven tooling and operation settings can be reused and managed. Additionally, the new hierarchical list view provides a much richer view of the model, allowing users to instantly understand the organisation and structure of the model," explains Doug Oliver, senior product manager at SmartCAMcnc.

UK Agent:
Keynsham Engineering Services
Tel: 0117 986 1460
www.smartcam.org.uk

New high speed all-format 3D viewer

Vero Software is rolling out a new high speed 3D viewer which directly displays and evaluates 3D CAD files without the need for the original CAD application. PartXplore can open the native files of Edgecam, VISI and WorkNC, with further brands in the Vero portfolio expected to follow suit in 2016 R2. PartXplore has been created to efficiently import and analyse all file types and sizes at high speed. It often takes less than half the time to open a file compared to the original CAD application.

Both novices and experienced users can build virtual unified prototypes or 3D models imported from a wide range of file formats, including Catia, NX, Parasolid, SolidWorks, Solid Edge, STEP, IGES and many more. The software saves the native CAD data in its own lightweight format, meaning manufacturers can carry out tasks such as calculating surface areas and volumes, and measuring thickness, dimensions and angles without requiring the original CAD information.

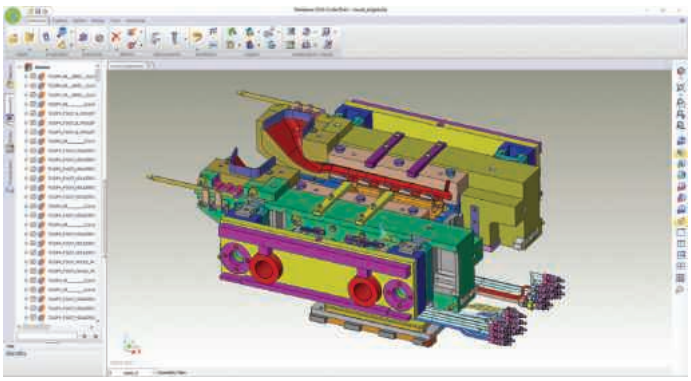
PartXplore product manager Massimo Vergerio says: "Users don't have to worry about format compatibility, or what CAD system their customers use. And a stand-alone lightweight application enables users to easily send 3D parts to colleagues and subcontractors through the internet, where recipient can immediately display and work on the 3D model''

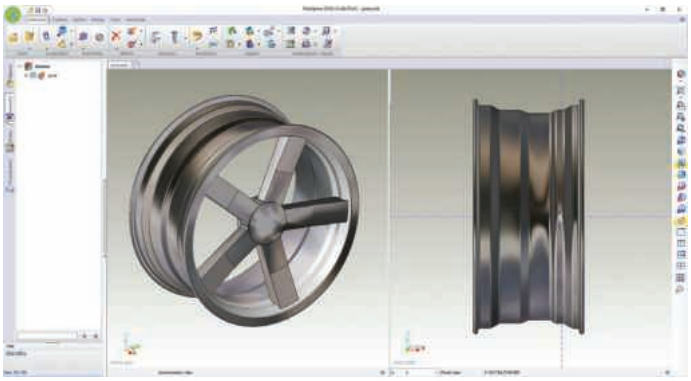
Vero has set up a new dedicated PartXplore website, **www.partxplore.com** which includes the ability to register for a free 30 day trial installation. PartXplore features include:

Measurements
Even staff who are not CAD experts can quickly master the software's wide range of 2D and 3D measurement functions, by using predefined selection modes such as points, 2D entities, planes and surfaces. Measurements can be automatically included as entities and anchored to characteristic points of the part. Entity labels automatically pivot to remain visible at all times.

Specialist functions allow more experienced CAD users to recover point clusters from 3D measuring equipment or machine probes, and to quickly check revisions against the original CAD geometry. Point files can also be generated easily for sending to 3D measuring equipment and NC machines.

Annotation
Ideas, observations, instructions and change requests can be conveyed quickly and easily. The need for 2D drawings is minimised, as users add dimensional and geometric measurements, annotations and labels directly to the 3D model.





Analyse
A full range of specialist analysis tools assist with quotes, diagnostics, assembly notes, and preparing 3D models. Much of the analysis functionality is normally only associated with more expensive CAD solutions.

The inside of parts and assemblies can be explored with high performance sectioning; the section plane rotated, panned or following a guide curve, simply by mouse clicks.

Curvature radius and plane face analysis is a valuable tool for providing accurate production times. In addition, draft angles and undercuts can be calculated and displayed extremely quickly, even on large components.

Animation
Timeline animations are set up by initiating basic movements such as translation, rotation or following a guide curve. Collision Detection Dynamic collision analysis ensures real-time control of mechanism interoperability or process control. Short videos can also be generated.

Documentation
Screen captures illustrate technical documents and assembly sheets and a large number of images can be readily managed and distributed.

Massimo Vergerio says: "PartXplore's intuitive, easy-to-use interface enables novices and experienced users alike to explore any type of 2D/3D CAD file. It gives access to the full set of core functions to ensure everyone can be up and running with the software instantly.

"This collaborative viewer makes it easy to visualise, analyse and share files where access protection ensures that only designated staff can open and work on the files."

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

Vero UK Ltd
Tel: 01189 756084
Email: stewart.bint@verosoftware.com
www.verosoftware.com

VERICUT V7.4 in pole position at Williams F1

Over 100 people from almost 60 of the UK's leading technology manufacturing companies attended CGTech's latest VUE 2015 (VERICUT Users Exchange), held in September, in the prestigious facilities at Williams F1, Oxfordshire. CGTech used the event to provide customers with a feature review of the latest release of VERICUT, V7.4, a world leading advanced independent CNC machine tool simulation and optimisation software, and a taste of the physics-based optimisation FORCE module.

John Reed, CGTech managing director, welcomed everyone to VUE 2015, with an overview of the changing market faced by the manufacturing industry sectors that are supported by VERICUT across the globe, such as aerospace, automotive and motorsports, medical, power generation, oil and gas, as well as consumer products. He explained: "We partner with the world's leading machine tool manufacturers and distributors, CAD, CAM and PLM software developers, cutting tool and tool management companies, which is why VERICUT is firmly established as the world's leading independent CNC simulation and verification software. As such, we all face the same challenges from the manufacturing industry: increase efficiencies and remove waste."

The company's tech team provided a feature review for VERICUT 7.4, highlighting the first thing a user will notice is a welcome screen that automatically displays when first launching a VERICUT session. The welcome screen provides access to commonly used first actions for a VERICUT session. The VERICUT user interface continues to get more customisable. VERICUT's desktop is enhanced with a new docking method enabling VERICUT's desktop to be configured in the most efficient manner. The new docking method is very flexible and provides a high level of customisation possibilities. Additionally, the status window is completely redesigned for better viewing, customisation and size. The status window information is divided into Information Groups, each containing a specific list of information.

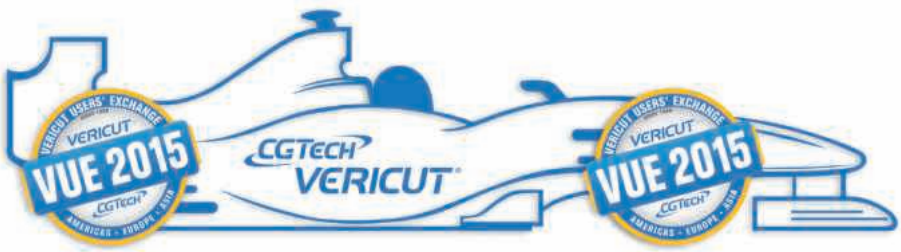
In addition to new features designed to make NC programmers' jobs easier, nearly 500 customer-driven enhancements and software change requests have been completed in version 7.4. These updates use the latest technologies to enable faster processing speeds, longer tool life and increased part quality. Added features to the user interface simplify the most common user actions and significant developer hours have been invested to increase simulation speed by more thoroughly taking advantage of multiple processors and background processing.

CGTech's UK sales manager, Rob Lightfoot presented the benefits of the new VERICUT Force physics- and mathematics-based modelling software designed to optimise machining rates "Because the software uses actual data for cutting tool forces and spindle power readings to calculate maximum chip thickness and feed rate it offers a number of technical benefits for machined parts within aerospace, automotive, industrial and other markets that use automated machining.

"With the material properties of the component and the cutting conditions also considered, VERICUT Force determines the optimum speeds for a cutting process and makes the CNC machine cut in the most efficient, fast and reliable way. This provide significant benefits when applied to any precision machining operation where challenging materials, such as titanium, high nickel superalloys such as Hastelloy, Inconel and Waspaloy, duplex and stainless steel, and any work hardening materials, that are typically used in mould & die and aerospace component production."

Another crucial element of the simulation and verification process involves importing and managing cutting tool data. For accurate machining simulation a higher degree of detail is required from the cutting tool model. This allows VERICUT to represent the material removal process exactly as it will occur on the machine tool in the real world. VERICUT Tool Manager has been developed to make this important part of the process much easier for the user. The simulation of a back facing tool was shown as a demonstration of the advanced cutting tooling technology supported by VERICUT.

Tool Manager's desktop and user interface is redesigned to enable easier user interaction. A new tool bar located at the top of the Tool Manager window consists of a combination of icons and pull-down menus providing easy access to all features needed to create and maintain tool libraries, create and modify tool assemblies, import tool assemblies and create or import OptiPath records.



CGTech Ltd
Tel: 01273 773538
Email info.uk@cgtech.com.
www.cgtech.co.uk

Alloy stockholder reaps huge benefits from modern bandsawing technology

Productivity increased by up to 75 percent, waste slashed and blade costs six times lower at Hempel Special Metals

Stockholding and cutting to length of titanium, nickel alloy and stainless steel bar and tube up to 250 mm diameter is the speciality of Hempel Special Metals, the Wokingham subsidiary of German family-owned group, FW Hempel & Co, one of the largest stockholders of such materials in Europe and Asia.

To keep pace with rising orders, in February this year the UK company invested in a third bandsawing machine, a KASTOwin A 3.3.

Holding AS9120 quality management accreditation for stockists and distributors in aerospace as well as specific approvals from aerospace primes, Hempel Special Metals derives nearly one-third of its turnover from the aerospace and defence sectors. It is a side of the business that the company is keen to expand and it will take a stand at the Farnborough Airshow for the first time in July.

Mark Glynn, general manager at Hempel Special Metals, with the KASTOwin A 3.3

The medical sector contributes around one-quarter of turnover, thanks in part to quality management accreditation to ISO 13485. Oil and gas is also a major market, if somewhat depressed at the moment, while 10 per cent of the firm's business comes from the so-called leisure industry - anything from Formula 1 to yachting to top-end bicycles.

Mark Glynn, general manager at the Wokingham centre says: "The German-built KASTOwin A 3.3 has really opened our eyes to what is possible in bandsawing.

"Our other two saws are seven and 15 years old respectively and manually operated, so I am not comparing like with like, but even so the improvement with the KASTO saw has been dramatic in terms of increasing throughput and lowering costs."

Quality and IT manager Robin Dawson explains: "As cuts have to be set by eye on our manual saws and because the comparatively low rigidity of the machines tends to cause the blade to wander, it is necessary to set tolerances of -0 / + 3 mm when cutting stock over 100 mm diameter.

"The waste is a little less for smaller diameters, but still appreciable. Overall, between 10 and 12 percent of stock was lost through having to set such generous allowances.

"In contract, tolerances on the KASTO bandsaw can be set at -0 / + 0.5 mm for all stock sizes and materials, which is a six-fold reduction in waste."

Achieving this level of precision in positioning is partly due to ballscrew rather than hydraulic material infeed. During the cut, high squareness accuracy and good surface finish on the cut face are a result of minimal vibration. This is due to a combination of machine rigidity, use of a 41 mm wide bimetal blade rather than a 25 mm blade as on the manual saws and automatic slowing of the downfeed on entry to the material.

Blade deflection monitoring confirms that the cut is always within tolerance and stops the machine if a hard spot in the material should cause the cut to drift outside the preset limits. In monetary terms, savings are substantial. A typical job at Wokingham involves cutting 1,000 billets from 130 mm diameter Ti64 titanium alloy bar over a three-month period. The overall amount of wasted metal resulting from the allowance has been reduced from three metres (1,000 x 3 mm) to half a metre, translating into a saving of £5,200.

Hempel Special Metals holds 50 tonnes of Ti64 alone in Wokingham for various regular customers, another of which requires 300 to 400 billets per month in diameter sizes of 85, 130 and 180 mm. Nickel alloys and stainless steels up to 152 mm and 100 mm in diameter respectively are also routinely processed. Substantial material and hence financial savings are achieved by cutting all of these metals on the KASTO bandsaw.

Time reductions are an additional benefit, especially when batch sawing. Programming is quick using the touch-screen SmartControl, also manufactured by KASTO, as cutting parameters for any given material, size and cross section are determined automatically by a built-in database. It is possible to program the saw to cut multiple different lengths from the same stock if required. Set-up is quick as well, as projection of a laser line onto the material indicates precisely the point of cutting.

Once in production, the KASTOwin is fast to complete each cut. For example, six or seven billets per hour can be achieved when processing 130 mm diameter Ti64 whereas production rate for the same stock on the other two machines is four billets per hour. Uplift in output rate on the KASTO saw is therefore between 50 and 75 percent. Moreover, energy consumption is less, as machine movements are largely electrically rather than hydraulically driven.

Another area of cost reduction is blade purchase, which is also down to the rigidity of the KASTOwin and its ability to suppress vibration. Mark Glynn comments: "We made nearly 2,500 cuts in the first seven months of operation and used only three bimetal blades, whereas we were changing blades on the manual saws once or twice a week.

"The tools were costing us £6,000 annually, but the fewer and wider blades for the KASTO saw will cost around £1,000 per year. At the outset, when we had not ordered a blade for two and a half months, our supplier telephoned us to ask if we had stopped sawing material on-site."

Apart from vibration suppression, a factor in tool longevity is the ability of the KASTO control to recognise when a new blade has been fitted and automatically reduce the downfeed rate by 40 percent for a short running-in period.

Blades with tungsten carbide tipped (TCT) teeth have been trialled at Wokingham, as they have the potential to cut difficult alloys faster, but in this application bimetal consumables are so efficient and last so long that TCT blades are not needed, particularly as volumes are relatively low.

Robin Dawson concludes: "We shopped around before buying the 330 mm capacity bandsaw from KASTO but liked the security of dealing directly with a manufacturer's subsidiary, rather than through an agent.
"We have been delighted with the performance of the saw, which is now the mainstay of our production, and with the service we receive from KASTO in the UK, both over the phone and on the odd occasion we have called them out to tweak settings."

KASTO Ltd
Tel: 01908 571590
Email: sales@uk.kasto.com
www.kasto.com

Robin Dawson programming the KASTOwin A 3.3 for cutting the next batch of alloy billets

A full range of circular sawing and deburring systems

The Kaltenbach Group of companies has announced two new cooperation's with leading machine tool manufacturers Zeman and RSA, complementing its existing range of machinery for steel cutting and processing solutions.

For the UK market, the cooperation between Bedford-based Kaltenbach and RSA, who have offices in Telford, will mean that both companies are able to work together to promote a full range of circular sawing and deburring systems.

This combined range extends from RSA's high quality, pull-down Haeberle saws through to Kaltenbach's semi- and fully-automatic machinery and ultimately the high performance RSA billet and tube processing lines, including its acclaimed tube deburring solutions.

RSA machinery is highly proven across the worldwide metal cutting industry, particularly in high volume applications such as the automotive sector, where productivity, reliability and fast cycle times are paramount.

The latest RASACUT models demonstrate incredible performance. For example, during Kaltenbach's IPS2015 exhibition in June, the RASACUT SH150-2 model was demonstrated simultaneously cutting 2 x 100 mm diameter solid bars of ST-52 material in just 12 seconds.

Additionally Kaltenbach now cooperates with Zeman, the Austrian manufacturer of world leading solutions for steel fabrication and assembly. Zeman's SBA (Steel Beam Assembler) range of machines represent a major leap forward in productivity potential when assembling the component elements of fabricated steel structures.

Zeman SBA systems use robotics for the welding and assembly work, with the range topping system able to automatically scan, pick and even reorientate fittings from a layout area and take them to the waiting steel beam for both tacking and final welding processes.

This approach virtually eliminates human intervention, automatically processing the final fabrication with full traceability and standards compliance. The systems achieve impressive and predictable performance with assured reliability from established robotic technologies, high build standards and software already well tested in the fabrication industry by Zeman themselves.

The Zeman product line also extends beyond welding solutions. The company additionally manufacture machine systems for producing items such as purlins and their 'SinBeam' steel beam design, which dramatically reduces section weight through the innovative use of a corrugated profile web in a fabricated steel beam.

Kaltenbach is well known for leading edge innovation in the steel processing industry and for machinery that achieves high levels of accuracy, repeatability and productivity. These are essential factors for the successful application of automated systems and the synergy between Kaltenbach and Zeman is a major advantage for those companies looking to invest in this new technology.

Alongside Kaltenbachs existing representation of ZINSER for steel plate profiling machinery and STIERLIBIEGER for profile bending, straightening and rotation, the new partnerships permit Kaltenbach to offer solutions to many more industry sectors and a considerably enhanced

portfolio to existing customers, in conjunction with their own comprehensive machinery range. As a German family-owned company with over 125 years of experience in metal-working, Kaltenbach is able to face the challenges posed by a constantly changing global market, with complete confidence.

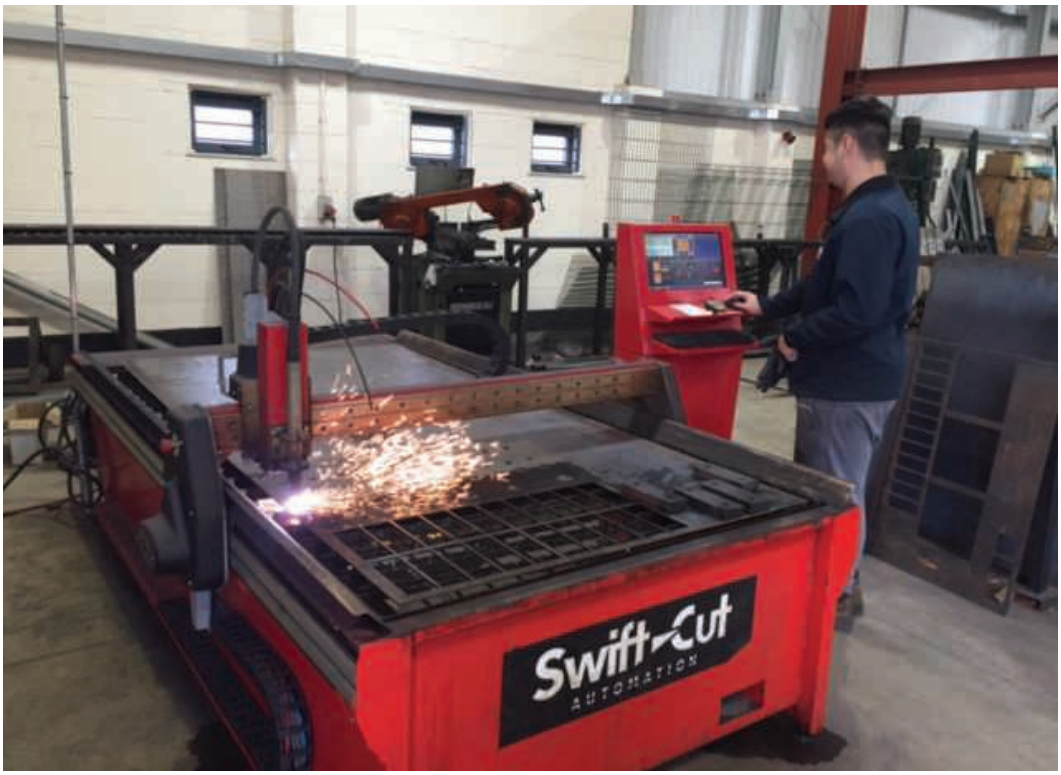
Kaltenbach will be presenting the full scope of its product range, including its industry partners, at the forthcoming Mach 2016 exhibition at the Birmingham NEC in April.

Zeman Tool and Manufacturing specialises in the creation and fabrication of high quality tooling. Zeman's broad understanding of casting and machining processes allows the company to innovate and create solutions for high quality tooling needs.

Zeman's main focus is the customer's tooling requirements, and its central objective is the customer experience.

Kaltenbach Ltd
Tel: 01234 213201
Email: sales@kaltenbach.co.uk
www.kaltenbach.com

Cutting system boosts business



Investing in a new Swift-Cut CNC plasma cutting system from premium welding supplier Foster Industrial has helped a company specialising in steel fabrication and installation to win more business and work more efficiently.

SFC Midlands is an expert in developing steelwork designs within all types of industrial, architectural and residential situations. With 20 years of experience in the steelwork industry, previous projects include the £1.5 million design and build of the feature facade on Holland Park School in London, the feature steelwork for Liverpool Museum and Burberry's new flagship store on Oxford Street.

The firm prides itself on its ability to find solutions to even the most challenging projects and working in this way requires clever thinking and flexibility. The team needs to be able to react fast in order to meet customers' needs. Installing the Swift-Cut CNC plasma cutting system has cut the turnaround time for some jobs by almost a week, increasing efficiency and profitability as a result.

Dan Sleeman, director at SFC Midlands, explains: "Previously we had to either use a punch machine to fabricate components or outsource the work. The scope of the punch machine was limited and both options were time consuming.

"Small jobs were becoming less cost-effective to complete because of the delays. Sometimes a whole job would be sat waiting for five days while we waited to get hold of components and then have to be rushed through over the weekend. We'd be paying overtime and other associated costs and it could add up to £1000 all because we had to wait for someone else to cut a £20 plate for us."

SFC Midlands invested £25,000 in the Swiftcut 2500 as part of a planned growth strategy to build the business and improve efficiency. It is the latest in affordable CNC plasma cutting, able to cut thicknesses of 1 mm–20 mm in mild steel, stainless and aluminium. Whether you want to produce a small quantity of bespoke parts or cut hundreds of shapes out of a single sheet, the Swiftcut is quick, easy and accurate.

The system was supplied by Foster Industrial with whom SFC Midlands has a long standing relationship. It also provided full training and continues to offer product support and knowhow.

Charles Foster, joint managing director at Foster Industrial, says: "The Swift-Cut CNC plasma cutting system is an affordable alternative for firms such as SFC Midlands, where flexibility and ease of use are key, but there isn't the volume of work to keep a larger machine running all day.

"There's no downtime, contracted software or other licensing costs and it can be up and running and making a difference on the factory floor virtually instantly."

Dan Sleeman adds: "We use the machine for 3-4 hours every day and there's no doubt that it is saving us time and money, especially on quick turnaround projects. Most of our work comes from repeat business and being able to complete jobs quickly has a direct impact on our ability to win further contracts.

"In the last year we have moved to new premises and invested heavily in new machinery to improve efficiency. Longer term we plan to continue this investment and take on new employees to cope with the steady growth we have predicted."

The Swiftcut is one of many models supplied by Foster Industrial, the UK's longest established premium supplier of welding and cutting equipment and supplies. The product range includes supply and support for other leading international brands Miller, EWM, Oerlikon, Tyrolit & Sia Abrasives as well as Hypertherm.

Originally founded in 1886 by Joseph Foster, Foster Industrial initially traded as coal merchants. 125 years on and Foster family members Richard and Charles continue to build the business.

Strategically located in the heart of the East Midlands, the Foster site offers easy access to the M1 as well as local delivery across Leicester and Nottingham. Based at a state-of-the-art 15,000 sq.ft site Foster carries a huge range of stock, technical advice, servicing and repairs, expert training as well the latest range of premium welding equipment.

Foster Industrial Ltd
Tel: 01509 509269
Email: sales@fosterindustrial.co.uk
www.fosterindustrial.co.uk

Addison introduces 'total machinery packages'

Cutting technology specialist, Addison Saws has introduced a number of 'total machinery packages' to make it easier for businesses to access the new cutting technologies they require.

"We are aware that machinery costs and funding issues can sometimes mean that smaller and start-up businesses in particular have to resort to buying used equipment," comments Addison Saws' sales director, Chris Wilson. "With that in mind, we have put together a choice of competitively priced cutting and sawing machinery packages to make investing in new equipment a highly viable option."

Carefully selected technologies for firms of all sizes

Although ideally suited to smaller businesses, Addison Saws' new equipment packages offer manufacturers of all sizes the opportunity to invest in carefully selected technologies at a fixed cost. All equipment comes from Addison's market leading range, from companies such as IMET, Mecal and Pressta Eiselle, and is supplied with a full manufacturer's warranty. Additionally, where access to funding is required, Addison Saws can put the customer concerned in touch with a leading independent finance provider.

A complete solution for Empathy Architectural of Warrington

One business that has already taken advantage of investing in a total machinery package from Addison Saws is Empathy Architectural of Golborne, Warrington. A specialist in the manufacture and installation of aluminium windows, bi-fold doors, curtain walling, aluminium cladding and roofing products, Empathy required a number of machines to enable it to be fully up and running as soon as possible after moving into a new manufacturing facility.

Seamless installation process

"Addison Saws supplied and installed all the technologies we needed to begin manufacturing at our new facility," says Empathy Architectural joint owner, Kevin Farrall. "Our machinery package included a mitre saw, copy router and end miller from Mecal, as well as a Velox circular saw and a Pressta Eiselle crimper.

"Everything was competitively priced, but perhaps most important of all, dealing with Addison meant we benefited from a totally seamless installation process. They also helped us find the funding package we required to buy all the new equipment.

"The team at Addison Saws has been extremely helpful and knowledgeable throughout the entire process. They advised on which machines were best suited to our needs and provided excellent user training following installation. It's fair to say that nothing was too much trouble for them," concludes Kevin Farrall.

Leading the way in sawing technology

Established in 1956, Addison Saws Ltd brought a new breed of metal cutting solutions to the UK and, in doing so, created a whole new market for bandsaws and circular saws. Today, almost sixty years on, Addison Saws Ltd. continues to lead the way in metal cutting technologies and offers an extensive range of full CNC machine tools from the world's premier industrial machine manufacturers, all supported by uncompromising levels of customer care.

The Addison Saws Ltd. product range includes everything from simple, manually operated machines to highly sophisticated, fully automated sawing lines and has recently been increased with the addition of heavy duty 3, 3+1, 4 & 5-axis long-bed multi-piece machining centres. Addison Saws Ltd. is part of the Addison Group, an organisation that also includes sawblade re-manufacturing specialist Dynashape Ltd., and tube-bending technology specialist, Tubefab.

To find out more about Addison Saws' total machinery packages, contact:

Addison Saws
01384 264950
Email: sales@addisonsaws.co.uk
www.addisonsaws.co.uk

Addison PROVEN IN PRODUCTION

Bend it, Bend it...

Tube forming company enjoys 55 percent greater productivity with new Prosaw system

Malvern Tubular Components Ltd has over sixty years' experience in supplying tubular products into many diverse markets, in particular the diesel engine, generator and radiator manufacturing sectors. Formed in 1942 the company is today a key subsidiary of Tricorn Group plc, a specialist in tube manipulation.

One market sector served by the company is the power generation industry, a market sector that has very precise requirements. So when it became clear that the company's existing large diameter tube sawing facility was not suited to meet the stringent tolerances required by this industry it was only natural that it should contact Prosaw to advise on a more applicable system.

Following investigation, Prosaw was confident that it would be able to hold the close tolerances required when sawing the 5 inch and 10 inch diameter tubes with a system that would also enjoy the additional benefit of increased productivity.

A Bomar Individual bandsaw, model 520.360 DGA NC was selected for this purpose, being a machine capable of precisely sawing up to 10 inch diameter tubes in mild steel or even 316 stainless steel.

Following a successful demonstration of its capabilities, the Bomar bandsaw was installed at MTC's Malvern factory, where the results have been little short of spectacular, showing a marked improvement on the results of the previous tube sawing facility.

Manufacturing engineer, Jerry Moule has been delighted with its performance and comments: "The Bomar machine is not only more accurate, but the cycle time is also considerably quicker than the system it replaced, due primarily to its capacity to accommodate tubes of longer lengths as well as its ability to cut tubes at a faster rate. These two factors are largely responsible for the substantial production cost savings we have enjoyed since this machine was installed."

"In addition, blade life has also been greatly increased and is now at least ten times longer than that of our previous machine, meaning that, in combination, these factors have been responsible for an very welcome 55 percent improvement in overall productivity."

Prosaw Ltd
Tel: 01536 410999
Email: sales@prosaw.co.uk
www.prosaw.co.uk

Dynamic sawing solutions

The HBE Dynamic series, launched by Behringer in 2013, has been a resounding success. The series is now being lifted into a whole new league in terms of performance level with an array of features provided as standard. The existing models have now been joined by two new "big sisters", the HBE563A and the HBE663A, launched at the Open House "World of Saws 2015" in June this year.

"The HBE Dynamic series addresses increasingly stringent market demands for ever more efficient, more economical and more precise sawing machines. Increased performance coupled with reduced energy consumption, lower space requirement without compromising occupational safety or handling simplicity: These were just some of the stipulations followed by the development process", recalls CEO Christian Behringer. From the date of the Open House, the new HBE Dynamic series is available in six model types 261A, 321A, 411A, 511A, 563A and 663A with corresponding cutting ranges, covering an extensive field of applications in the steel trade, machine and tool building and in high-end metalworking businesses.

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

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

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

The HBE261A Dynamic's sawing drive of 2.6 kW enables a high machine throughput while requiring minimal energy input, which adds up to efficient production.

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

Lowering the saw frame prior to the cut is performed in the HBE Dynamic using a proven technology which ensures the utmost process reliability. Instead of an electronic sensor or manual entry of the height information, the height is detected by a mechanical T-bar which brings the rapid lowering movement to a stop as soon as it senses the upper edge of the material. The engineers gave process reliability clear priority over the use of susceptible electronic systems, as these machines are frequently automated and need to guarantee trouble-free operation when operating unattended.

The funnel-shaped machine base enables good access for cleaning and maintenance. The chip conveyor itself can be supplied as a paddle style conveyor or worm and can be simply pulled out. To guarantee the most effective possible cleaning of the saw blade, the HBE Dynamic features electrically driven double chip brushes which clean the bandsaw blade of adhering chips synchronously while sawing operation is in progress. A quick-change device permits the brushes to be exchanged without excessive loss of time.

Behringer Ltd
Tel: 01296 668259
Email: simon.smith@behringerltd.co.uk
www.behringerltd.co.uk

Kerf introduces cost-effective plasma cutting machine

Widely acknowledged as an industry leading manufacturer of oxy/fuel, plasma and waterjet machine solutions, Kerf Developments has now introduced its latest profile cutting machine, the Plasmaster 3015.

The Rochdale based company has a good reputation for the quality of its high definition plasma cutting product range. However, as with all quality products, the price can occasionally be restrictive for some customers looking for an entry level machine at an affordable level. Until the arrival of the Plasmaster 3015, Kerf catered for the entry level customer with its refurbished second hand stock.

Commenting upon this scenario, Kerf Development's sales director, Craig Walsh says: " The void between entry level machines and our entry level (RUR) high definition plasma cutting machines has until now, been filled partly by our own second hand machines that we have refurbished and sold on. However, we are conscious of the needs of manufacturers, especially in smaller businesses that are looking for a cost-effective solution that is based either on the available budget or the workload planned for the machine. The entry level machines that have been available over the years have in the main been designed and developed for the hobbyist or educational markets.

"With the new Plasmaster, the target applications range from those wanting to cut thin materials such as ductwork, right the way through to heavier duty fabricators needing to cut thicker materials. Kerf has created a robust, efficient and productive machine that appeals to manufacturers on limited budgets."

The bed of the Plasmaster machine consists of a heavy duty plate support system that contains individual dross bins that can be easily accessed to remove waste material. It is capable of supporting a plate size of 3.0 m by 1.5 m and up to 25 mm thick. The engineers at Kerf designed the base to be free standing and not connected to the machine frame. This eliminates any potential shock loading issues and significantly enhances the process reliability of the Plasmaster 3015.

"When we developed the latest Plasmaster machine, our target was to utilise products from leading global suppliers. These included the proven Burny control and drive system with Smart HC intelligent height control and compliment this with a proven dependable machine frame. We have used linear bearings for the X, Y and Z axis. The benefit for users is a very smooth cutting motion providing excellent positional accuracy, good cut quality and excellent repeatability" continues Craig Walsh.

"Our brief when developing this machine was to deliver a high quality, flexible and small footprint machine that consists of established and renowned components from Lincoln Electric and Burny. The result is the Plasmaster 3015, which

is without doubt, the best in class machine at the entry level of the plasma cutting market. The underlying factor with this machine is that all the component parts are from world leading brand suppliers and the service and support is provided by Kerf. In a low cost market segment where historically after sales parts and service have not feature highly, we are confident that our build quality and service support will really shine through with this machine," he concludes.

Kerf Developments is the leading British supplier of profile cutting, oxy-fuel cutting, high definition plasma cutting and waterjet cutting equipment.

The success of the company is based on providing quality products at competitive prices and backing the equipment up with effective customer service and support. Kerf is completely independent and as such is able to offer 'best of breed' solutions that meet customer requirements. As well as turnkey installations or upgrades, Kerf Developments offers: a range of support services; supply of spare parts; machine tool rebuilds; consumable sales; customer training and consultancy; new machine sales.

Kerf Developments Ltd Tel: 01706 757 670
Email: sales@kerfdevelopments.com www.kerfdevelopments.com

Second TRUMPF TruLaser with BrightLine

Nuneaton-based Subcon Laser Cutting Ltd, one of the UK's most successful and oldest laser cutting companies, has ordered a second TRUMPF fiber laser machine with BrightLine fibre technology. The new TruLaser 5030 fiber machine will join an existing TruLaser 5040 fiber with BrightLine fiber that was installed 12 months ago, as well as six other TRUMPF 2D and 3D 5-axis laser cutting systems.

Established in 1989, Subcon Laser took delivery of its first TRUMPF laser in 1997 and has never looked back. However, the advent of solid-state or fibre laser technology has, according to general manager Tom Mongan, delivered in a genuine step change within the industry.

"In my opinion, with the advent of BrightLine fiber technology from TRUMPF, fibre laser machines are now so flexible in terms of the material thicknesses that there seems only one choice moving forward," he says.

"Our existing TruLaser 5040 fiber is delivering fantastic results across the thickness spectrum, from 0.5 up to 25 mm thick," he continues, "while the operator friendliness is second-to-none – you press a button and it runs.

Another advantage offered by the fibre machines is the potential to cut reflective materials such as brass and copper. In fact, we've recently secured a new contract to profile copper components, thus creating a whole new revenue stream."

Moreover Subcon Laser's existing TruLaser 5040 fiber has ably demonstrated the advances in speed that are possible when cutting thin sheet with a fibre instead of a CO_2 machine. One part has seen cycle times reduced from 11 to just 4 minutes (a 64 percent improvement).

The TruLaser 5030 fiber with BrightLine fiber is for installation at the company's purpose-built, 60,000 sq ft facility. The machine was ordered to take up more capacity in the wake of increasing customer orders at this 30-employee, £4 million turnover business. Indeed, July 2015 proved to be Subcon Laser's best month ever, with industries such as automotive particularly buoyant. Other sectors served by the ISO 9001:2008 accredited company include white goods, yellow goods, architecture, rail, marine, energy and defence to list but a few.

"There simply aren't enough hours in the day," says Tom Mongan. "We've been running 24/7 for the past four years and still we find the need for more investment. TRUMPF are the machines of choice because of the reliability, cost-efficiency and energy saving benefits they deliver."

"We are very keen to get the extra capacity on board," he continues. "Orders are increasing and we need to grow our throughput. Last year, for example, we did over half a million parts for one particular customer. With this in mind, although price and quality are vitally important, so is delivery, with lead-times being constantly squeezed. The ability to simply load the program and start cutting gives laser cutting a huge advantage over punching."

Ultimately, Subcon Laser's continual investment programme is ensuring it remains at the forefront of the industry. "Our carefully planned capital investments enable us to offer cost effective, precision cut components that appeal to customers large and small," he concludes.

Indeed, such is the company's reputation for investment and export success (current export markets include India), that a number of esteemed political figures have visited Subcon Laser in recent times, including Vince Cable when he was Business Secretary, and George Osborne, Chancellor of the Exchequer. A representative team from Subcon Laser was also invited to meet the Prime Minister, David Cameron, at 10 Downing Street in June 2015.

TRUMPF Ltd
Tel: 0844 4820188
Email: sales@uk.trumpf.com
www.uk.trumpf.com

Flexible automation for Strippit-PX punch presses

LVD has announced the FA-P (Flexible Automation for Punching), as its most advanced automation yet. It offers dynamic load/unload capacity, smart part picking and a large area for stacking punched parts directly onto designated pallets. FA-P is now available on the Strippit-PX punch press.

Advanced part picking and stacking
FA-P loads sheets up to 3050 x 1525 mm and material thicknesses up to 4 mm from two shuttle tables with a maximum capacity of 3000 kg.

The automation system can handle punched parts from 200 x 100 mm up to large sheet sizes. Two independent gripper arms are automatically positioned to pick the part. The suction cups are activated following the nesting configuration calculated by LVD's offline software module CADMAN®-P. Small, closely spaced suction cups are used to pick small parts while larger suction cups are activated for picking larger parts and loading full size sheets.

Large stacking area
A large stacking area of 8 m² provides space for 8 europallets. A unique laser distance-sensor measures the height of the pallet and the stacked parts. Following this measurement, the suction cups smoothly position the parts on top of one another, forming perfect stacks. No secondhand operation is required to change between pallets within the stacking zone. The skeletons are quickly evacuated from the machine onto a pallet, significantly reducing the offloading time.

Pick and sort with TOUCH-A control
Based on the job-list and the measured stack height, TOUCH-A control software picks and sorts each part onto its assigned pallet. A new job can be started with partial pallets from previous operations. Additionally, TOUCH-A allows the operator to modify the sorting based on the pallet configuration. The control counts and validates each stack of parts upon job completion.

LVD-Pullmax Ltd
Tel: 01295 676800
Email: sales@lvduk.com
www.lvdgroup.com

Accuracy, productivity, reliability and economy

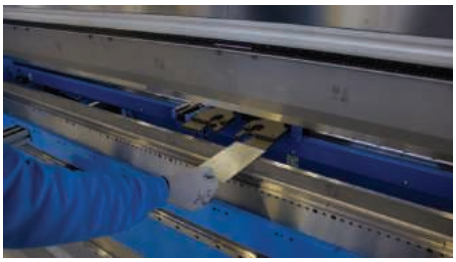
Prima Power has extended its range of press brakes with the introduction of the new 200 ton eP-2040 with a 4m bending length. All the ep-series press brakes use servo electric technology, have O-frame construction, an open tooling concept, Prima-Electro touch screen control and Lazer Safe 005 "Block Laser" for tool and operator safety.

The new eP-2040, which has a CNC crowning system, is the biggest of the range, which starts with the eP-0520 at 2040 mm and 52 ton, the eP-1030 at 3060 mm and 105 ton and the eP-1336 at 3655 mm and 135 ton.

The belt driven mechanism is inherently more reliable and has less critical parts than a hydraulic press brake and, when combined with high resolution encoders, offers accurate bending along the whole length of the machine with even force distribution. Furthermore, servo electric technology allows production to start as soon as the machine is switched on without a warm-up phase, enhancing the productive hours available. It also uses less energy, requires less maintenance and reduces the number of scrap parts, keeping down the cost of ownership and hence reducing cost per part.

The eP-2040 has a new lower beam design with CNC crowning system. According to Prima, this is the first machine on the market which combines the benefits of a belt driven upper beam with CNC crowning. Prima Power's unique CNC crowning technology increases the versatility and flexibility of the eP-2040 by automatically adjusting the lower beam to suit the different materials and part sizes, resulting in higher precision and a constant bending angle.

By opting for an O-frame construction, Prima Power has ensured that the machines are extremely rigid even when under full load, avoiding distortion, which can cause problems in other frame constructions. The design also allows the bending of parts up to the full width of the machine and to a larger C-depth. The eP-series of machines is built with accuracy in mind and has a rigid back gauge construction which operates over the whole bending length. There is also an option for in cycle material thickness measurement. This automatically adjusts the bending to take account of actual differences from the nominal thickness and hence produce highly accurate and consistent parts. For large parts where two operators are required, Prima Power offers the AQ bending follower, which makes it possible to manipulate these large parts with one person without loss of accuracy.



The Block Laser system allows the operator to safely work close to the tools without interrupting high approaching speeds, protects tools from crashing and includes a Box mode to bend complex shapes without a compromise on speed, resulting in significantly shorter cycle times.

Open tooling ensures that the machine will support the vast majority of tool configurations and it is designed for ease of operation and setting. This flexibility reduces idle time and enables companies to make full use of any existing investment in tooling.

Programming is easy with 2D graphical programming on the touch screen control or offline on the Auto Pol system which supports most CAD files and has its own 3D graphical design capabilities. The system includes unfolding, crash protection and simulation, and generates the NC code and documentation necessary for the machine operator to set, verify and manufacture the part.

Overall, Prima Power's range of servo electric press brakes offers users reliability, accuracy and high productivity at low cost. With the launch of the eP-2040, Prima Power has made bending the largest parts easy, accurate and economical.

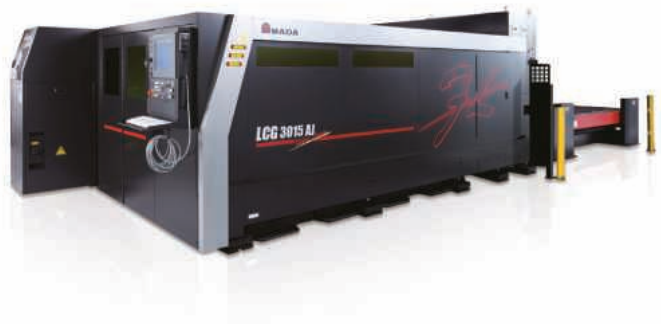
The Prima Power Group offers a complete range of equipment for the sheet metal industry. With over 30 years of experience, it has over 10,000 machines installed in more than 70 countries. It has manufacturing facilities in Italy, Finland, the USA and China and it offers sales and service through a worldwide network of Group companies and distributors. Its range of machinery covers bending, punching, punch-shear, laser, combi and FMS. Automation through automatic loading and unloading, transfer between stations and buffering are highly important for modern productivity. Prima Power can provide a range of solutions and software systems tailored to suit manufacturer's requirements, even for the most complex applications.

Prima Power UK Ltd
Tel: 0844 4996241
Email: daniel.mcginty@primapower.com
www.primapower.com

AMADA pioneers the latest laser technology

The new AMADA LCG3015 AJ 4kW is a high speed, direct drive fibre laser cutting machine that is certain to speed up sheet metal manufacture. Originally launched in 2014 in 2 kW guise, over thirty-five units were sold in Europe in just ten months. This brand new model has an increased cutting capacity and can be 90 percent faster than a 2 kW fibre laser for some applications.

The cutting capacity on the LCG3015 AJ 4kW has increased to 22 mm mild steel, 18 mm stainless steel, 16 mm aluminium, 10 mm brass and 8 mm copper. The machine offers higher productivity and is especially skilled in cutting thin materials at very high speeds. Its high torque helical rack and pinion direct drives create a swift 170 m/min combined positioning speed. Automation is another important feature on this model and it is equipped with an automatic nozzle changer as standard. AMADA also offers either a single pallet loader or a full multi-pallet tower system for even more efficient cutting.



AMADA is the only laser manufacturer to design, develop and build its own fibre laser oscillator which features in this machine, the AJ 4000. This dedicated, small footprint oscillator produces a very high quality beam which allows extremely high speed cutting of thin materials, as well as opening up thicker material processing applications.

The new AMNC 3i NC control features a 21.5" HD touch screen, which allows for faster and easier operation. It also features on-screen nesting capabilities, graphical program recall from network and production monitoring analysis.

Another of AMADA's successes is the ENSIS AJ fibre laser which was also launched in 2014. The unique quality of this laser lies in its ability to cut both thin and thick metals in an efficient and eco-friendly way with no need to manually change nozzles or lenses. The laser can automatically switch between an extremely thin beam of high energy density to cut thin material at high speed to a beam of wide kerf similar to that of a CO_2 laser that is perfect for cutting thick material. This is achieved with AMADA's patented Variable Beam Control Unit which is unique to the ENSIS laser.

Amada United Kingdom Ltd
Tel: 01562 749500
Email: info@amada.co.uk
www.amada.co.uk

Speed at its peak

Saves time, makes money. **The DG modular interchangeable-head milling system** featuring a patented quick-change system. High-end technology for faster cutting head changing during step milling, groove milling, chamfering, profile milling and high feed milling of steel. The steel-carbide combination, featuring a segmented thread, ensures maximum rigidity and concentricity. Cutting heads are available in a range of designs and sizes. So why not use a quick-change approach to get a real head start in your milling work? **www.phorn.co.uk**

www.phorn.co.uk

HORN – LEADERS IN GROOVING TECHNOLOGY

GROOVING PARTING OFF **GROOVE MILLING** BROACHING **PROFILE MILLING** DRILLING REAMING

LEGENDARY PERFORMANCE

DRAGONSKIN

APPROVED DRAGONSKIN GRADE • LEGENDARY PERFORMANCE •

Full Speed Ahead!

WTX FEED UNI – Three Flute Geometry enables high feedrates

MACH 2016
11-15 April
NEC • Birmingham UK
machexhibition.com

Stand No. 5641

TOTAL TOOLING = QUALITY x SERVICE ^{2}

WNT

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