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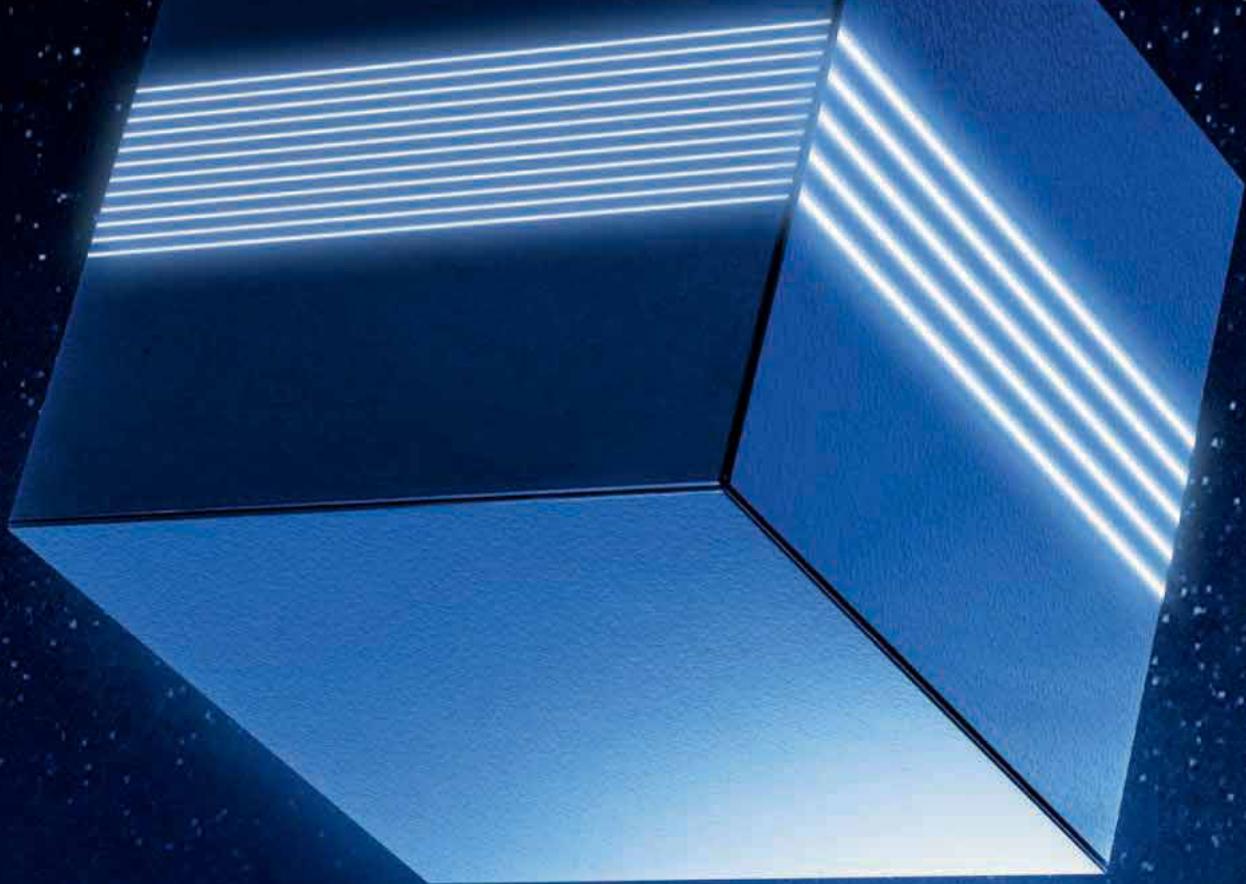
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NEXT ISSUE - JUNE 2018

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- Automotive Report
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A new benchmark for bespoke grinding centre performance

Designers at Kellenberger have unveiled the new 100 concept machine range, which opens up many new possibilities for manufacturers in the mid-market, high precision grinding sector.

The new Kellenberger 100 platform uses many of the proven features of Kellenberger's Vista and Vita machine ranges alongside the Tschudin T25 and Jones & Shipman Ultramat CNC and Ultragrind 1000. However, because of its single common platform modular design, the new machine concept offers features beyond the capabilities of its predecessors and delivers the most flexible configuration options to accommodate the widest range of grinding operations. The modular approach also creates reduced build times and, as a result, it is possible to optimise manufacturing costs for the machine while ensuring excellent performance with numerous 'standard' options available to effectively build a bespoke machine.

The user-friendly and ergonomic design of the Kellenberger 100 machines features a new, simple operator guidance system with an intuitive touchscreen panel. The machines are equipped with the latest Fanuc 31i CNC controls with 19" touchscreen with, as an option, cycle programming or workpiece-related graphic programming functionality available.



Three important features distinguish the new machine series: an innovative, collision-free and compact universal wheel head layout; a significant upgrade in key performance features; a greatly enhanced, service friendly design.

The new tandem wheel head has a compact construction with 11.5 kW drive power and reinforced casing for larger diameter HF grinding wheels when internal grinding. There are 10 wheel-head variations, including tandem and diagonal arrangements to permit optimum layout of the machine based on the components being processed. Maximum wheel head diameter is 500 mm.

Grinding performance is upgraded with the improved wheel drive power supported by a newly designed Z guideway and a higher profile, precision direct drive C-axis for non-circular grinding.

Other key features of the 100 concept machines include a coated guideway for wear-free use and perfect contour accuracy, a new dressing concept, an integrated lifting system for grinding wheel change and tailstock mounting and temperature stability, thanks to an integrated cooling circulation system.

Two bed capacities are available offering 1,000 mm or 600 mm distances between centres. The height of centre is 200 mm and the workpiece load capacity is 150 kg. There are also two tailstock options: a standard tailstock up to 100 kg and a reinforced version up to 150 kg.

The machine featured at MACH will be the 1,000mm between centres variant, equipped with a WeFlex automated load / unload system.

Read more on page 6

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Sir Ben Ainslie set to open MACH 2018

The largest manufacturing and engineering exhibition in the UK, MACH 2018 is set to open in April at the NEC in Birmingham. This five-day celebration of UK manufacturing will be officially opened on the 9th April by the most successful sailor in Olympic history, Sir Ben Ainslie. Sir Ben won medals at five consecutive Olympics from 1996 onwards, including gold at the four Games held between 2000 and 2012.

Sir Ben has a keen interest in manufacturing and the technology behind it, with his British America's Cup team, Land Rover BAR employing the latest manufacturing processes in the creation of its foiling race boat for the America's Cup.

James Selka, CEO of the MTA, says: "We are delighted to welcome Sir Ben to open MACH 2018. We know how much hard work and engineering excellence has been employed in the creation of the Land Rover BAR team. They are a fine example of world-class British engineering and sporting know-how. Sir Ben is a true legend and we are honoured to have him opening the UK's premier manufacturing and engineering showcase."

Sir Ben Ainslie says: "At Land Rover BAR, we bring together huge resources of technical, design and engineering knowledge to create something truly British and unique. We invest in technology and innovative skills to find solutions for long-term issues in sustainability. I'm very much looking forward to opening the MACH 2018 exhibition and seeing the latest

innovations coming out of the UK's manufacturing technologies sector."

What's on show?

The 2016 edition of the exhibition was hugely successful, boasting sold-out exhibitor space, a 10 percent increase in visitors on 2014 and over £150 million worth of business attributed to the show.

The overriding theme running through the show is interconnected technology and the future of manufacturing. MACH showcases live working machinery and brings together the industry's finest manufacturers across a range of technologies, including milling, turning, metrology, additive manufacturing, tooling and Industry 4.0 technologies.

As well as all the technology on show, there is a vibrant seminar programme, which includes leading speakers from academia, as well as industry, marrying together the theoretical and practical aspects of 21st century manufacturing. With live demonstrations and a packed seminar programme, MACH 2018 is the place to get business done.

James Fudge, head of events at the MTA, says: "MACH is a great barometer for judging the health of the UK's manufacturing sector. Exhibitions are a fantastic way to do business, and we feel we



have created the perfect environment for that to happen at MACH 2018."

Grinding and Surface Finishing at MACH

Production grinding and metal finishing have always been well represented at MACH and this year's event is no exception. A number of grinding machine manufacturers and distributors are featured, including Advanced Grinding Solutions, Danobat, Fritz Studer, Jones & Shipman Hardinge, Matrix, RK International, SSP Technology, and Vollmer as well as abrasives and grinding wheel companies such as GSE, Master Abrasives and PBR Abrasives. Surface finishing will be well represented by leading providers such as Delapena, Ellesco, Engineering Utilities, Fintek, Fladder and Kemet. Component cleaning is also a very important subject for production engineers and a range of companies will be in attendance, for example Banner Chemicals, EcoClean, Kumi Solutions, Safechem and Turbex.

Copies of the show issue of Grinding & Surface Finishing magazine will be available from the Roger Barber Publishing **Stand H20-22**.

MACH 2018 takes place between 9th-13th April and visitors can register for their entrance pass and fast track entry pack now, via the MACH exhibition website at www.machexhibition.com.

Further information about the MTA and its members can be found at www.mta.org.uk



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UK machine debut for Okamoto courtesy of Jones & Shipman

The UK debut of an entirely new Kellenberger universal grinding machine concept and a first MACH appearance for Okamoto Works under the representation of Jones and Shipman are the highlights of The Hardinge Group stand at MACH 2018.

Jones & Shipman represents the interests of all members of the Hardinge grinding brands in the UK: Kellenberger, Hauser, Voumard, Tschudin and Usach. It is now also the exclusive distributor for the independent Okamoto Works in the UK, collectively offering a vast portfolio of grinding machines covering virtually every discipline.

Featured at MACH 2018 for the first time will be the newly introduced Kellenberger 100 concept that can be tailored to meet specific customer requirements. The 100 series platform represents a complete overhaul of the high-performance, economical grinder segment in the Group's portfolio to meet a range of future manufacturing demands. Based on a modular design, it incorporates key elements of Kellenberger's Vista and Vita model ranges, the Jones & Shipman Ultramat CNC and Ultragrind 1000 and the Tschudin T25, aspects of which have been integrated into the new range.

With the 100 series, Kellenberger has developed a platform on which diverse machine concepts can be realised in line with customer budgets and performance expectations; in effect, offering the most diverse range of configurations to achieve the widest range of grinding operations at a highly competitive price.

In terms of functionality, the new 100 platform far exceeds the capabilities of many existing grinding machines. Due to its modular configuration, assembly of 100 series machines is simplified, making it possible to optimise manufacturing costs for

the machine and ensure an excellent price/performance ratio for the purchaser. Numerous 'standard' options can put the customer's finishing touches on each individual machine.

The machine featured at MACH will be the 1,000 mm between centres variant equipped with a WeFlex automated load / unload system supplied by Wenger AG. This is an option that can be fitted to any Kellenberger 100 derivative.

Also featured is the latest version of the UK-built Suprema Easy cylindrical grinding machine. This multi-purpose machine has a reputation as a true 'all-rounder', being equally adept at processing high volume production grinding work or fulfilling high precision small batch quantities and one-off work as encountered in tool room or prototyping environments.



Although the machine at MACH has a 1,000 mm grinding capacity, a longer 1,500 mm capacity version is available. The Suprema model has a universal wheel head with two external wheels and one internal.

A key factor in the design of these robust and comprehensive cylindrical machines was the ongoing need for high geometric accuracy with quick changeovers between different grinding operations to maximise machine usage.

A USP and real advantage comes from the speed in the setup of dressing and grinding cycles via Jones & Shipman's specialist fast-to-set "Easy" graphical grinding software, utilising touch screen technology.

Other features of the Suprema include the latest Fanuc power motor control with Fanuc digital drives and motors, Heidenhain's 12.5 nm scales to both the vertical and cross feed axes, increased diameters on both the left and right hand external wheels for the universal wheel head

configuration, to offer longer wheel life and improved productivity by reducing the number of dresses required in the grinding cycles.

Exclusively representing Okamoto in the UK, Jones & Shipman offers its comprehensive range of grinding machines from entry level to very high specification, covering surface, rotary and vertical as well as their cylindrical and internal grinding machines.

The Okamoto ACC-63SA surface grinder is an ideal toolroom machine. It features a highly robust, re-enforced construction and 600 x 300 machine table with both the table and cross feeds featuring double-V slide ways to ensure long life and maintained precision.



Equally suited to piece part work in a toolroom or prototype area or even small part volume production, standard features of this well specified machine include automatic grinding cycles and intuitive controls to simplify machine operation and optimise productivity.

The specification can be upgraded further with additions such as an electro-magnetic chuck, temperature stabilised wheelhead, an automated balancing system and coolant system filter and a wheel flange.

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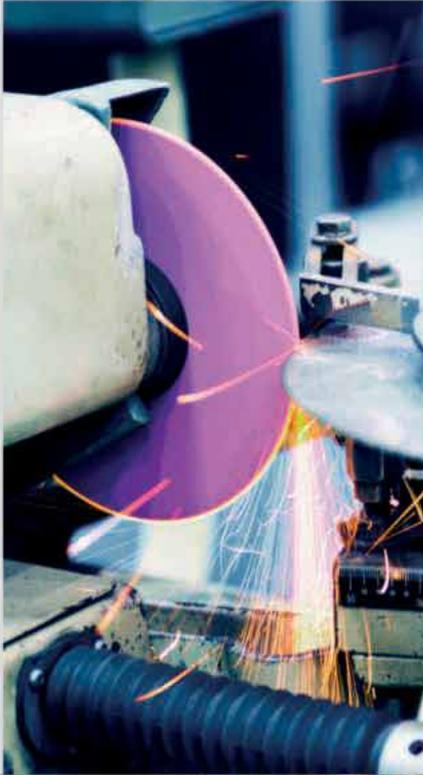


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GRINDING MACHINES SUPERFINISHING DEVICES MEASURING EQUIPMENT ABRASIVES

GSE Technology: service from Holland

Over 35 years in the metal industry, GSE Technology has established a reputation as an innovation partner in the world of grinding. Over this period, the company has developed a broad expertise and knowledge of products, materials, processes as well as equipment. Its subsidiaries GSE Materials B.V. and GSE Machines B.V. provide a unique combination.

Extensive product range in stock

GSE Materials B.V. supplies durable, carbide rods in various qualities and in virtually all standard diameters and lengths, directly from stock and with guaranteed traceability, through batch management.

"If desired, we can prepare our standard products. Our in-house sawing, grinding and laser service allows us to respond quickly and accurately to any customer wish," says managing director Joost Cox. "Be it a single piece or a large quantity, high reliability, quality, speed and flexibility are guaranteed, but we also pay maximum attention to sustainability, efficient production, waste separation and reuse of packaging."

Accurate, stable and easy to use

Innovation is the core activity of GSE Machines B.V. Precision grinding machines, dressing machines, cutting machines, laser marking machines and various equipment represent major innovation for the metal



industry in the European and UK markets. The machines have high accuracy and stability, but are also well-known for their optimal user convenience. This is the reason why GSE uses the machines in their own grinding shop in Deurne, Netherlands.

Full service

"Customers who purchase our machines can rely on our full service," says Joost Cox. "All machines are checked by our qualified technicians and, if desired, customised for each client before they are shipped. At the customer's location, the machines are

installed by our engineers and operators are trained. Our service technicians can also provide additional services and maintenance. As we have a number of machines in stock, we can quickly provide them at the request of customers. We can also flexibly scale up our own grinding service."

Easy and quick ordering system

In March, GSE introduced a Quick Order app to be used on all mobile devices, allowing customers to order materials even more easily and quickly. "The app will be presented at MACH, Birmingham on our exhibition stand dedicated to Service from Holland," says Joost Cox. "The clogs, windmills and cheese will be present, but more importantly our carbide rods and grinding service. We will also demonstrate the operation of some machines and innovations, for example our double gripper and the precision grinding machine equipped with two sets of grippers that significantly shortens the loading time."

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MACH 2018
Hall 6, Stand 605

Service from Holland



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Advanced Grinding Solutions at MACH

Advanced Grinding Solutions (AGS) has booked one of its biggest ever stands at the forthcoming MACH show, where it will be exhibiting six machines. None of these machines have been exhibited here before and therefore many UK engineers will be getting their first opportunity to see this range of advanced grinding and finishing machinery - the widest range on display at the show.

Rollomatic, a leading tool grinding machine manufacturer, is demonstrating its intention to increase its market presence here by exhibiting its NP5 ShapeSmart machine in the UK for the first time. This machine is used by many UK cutting tool manufacturers to quickly and easily cylindrically grind carbide and HSS tool blanks to diameter and form shape, rather than to do so on multi-axis tool grinders where the blank preparation process on those machines takes considerably longer, is more expensive and is generally not as accurate. Cutting tool and punch manufacturers are invited to receive a demonstration on the many advantages of the Rollomatic NP5 and to understand more about Rollomatic's wide range of CNC tool grinding machines.

The Rollomatic machine is suitable for the grinding of components up to 25 mm in diameter and has an integrated robot loader with a capacity for up to 1,000 parts. The



Parts made on a Rollomatic NP5 machine

NP5 grinds to mirror finishes, can control diameter size to +/- 0.0005 mm, and runout concentricity within 0.001 mm. Fast cycle times are assured due to Rollomatic's patented "Pinch & Peel" grinding process whereby the machine has the ability to mix a multi-pass rough grinding operation with a final through-feed pinch grinding pass and, if required, rough and finish grinding in a single pass. The NP5 machine is also able to grind non-round special forms and flats as required for punch tools. This is the first time that Rollomatic has exhibited a grinding machine here in the UK.

Rollomatic's line up is completed with its LaserSmart 501 machine that features the simultaneous 5-axis high precision laser machining of tools made from ultra-hard materials such as PCD, CVD, and natural diamond. The LaserSmart 501 processes multiple operations such as cutting-edge generation, chip breaker machining and cylindrical land machining in one complete setup and can produce cutting edges with a radius of under 1 µm.

Platit is also exhibiting in the UK for the first time and will be showcasing its latest Pi111 Plus coating machine; the first time that any coating machine of this type has been shown at a UK exhibition. The Platit machine being demonstrated will be supported by the presence of Dr Tibor

Cselle, one of the world's foremost experts on coatings for cutting tools and topics will be explored, such as why tool manufacturers should invest in their own coating technology and what are the latest and best coatings for various milling and drilling applications.

The main application for Platit coating machines is the coating (usually TiN, TiCN, CrTiN, etc) of end mills, form tools, drills, inserts, saw blades, and broaches. Platit offers cost-effective solutions, in order that tool manufacturers can coat their own tools instead of relying upon expensive subcontractors. Tool manufacturers that are driven to produce tools that last longer and cut faster also need to differentiate their products from their competitors and coating offers them the ability to do this. Cost saving



Rollomatic NP5 machine



Platit Rainbow coated end mill

is only one driver for a tool manufacturer to invest in a Platit coating machine; another important reason is to reduce the time from order to a finished product because no external subcontractor for coating tools can respond as fast as an in-house facility. Platit does much more than manufacture coating machines; it is constantly developing new coatings for its customers and offers a full consultancy service for end users to ensure that they are using the optimum coating for their applications.



Various tools on a Platit coating machine

Magnetfinish machines for cutting tools use a unique process that's been developed to dramatically increase the performance and lifetime of tools which last much longer and can be ran at higher speeds and feeds after being processed using Magnetfinish technology. Abrasive powder is processed by magnets across the surface of cutters with controlled but variable directions. The ground surfaces of cutting tools are polished and the cutting edges machined with a precisely defined and fully reproducible radius of between 3 µm and 50 µm.

Magnetfinish will be displaying its latest MF73 machine with two robots that accommodate automatic loading from pallets, combined with wash, dry and demag. This allows entire batches of tools to be processed automatically without any operator involvement. The processing times for cutting tools are extremely fast with the average machining time for smaller tools being in the region of 10 seconds.

High quality tools need perfect cutting edges. The accuracy of the radius has to be



Magnetfinish machine for cutting tools

extremely tight so that a high or low flute does not cause uneven metal removal, thus affecting part geometry, surface quality and cutting tool life. The cutting edges of the flutes must have no jagged edges, chips, cracks or other irregularities. The presence of these would mean that the cutter edges would be subject to early wear as soon as they contact the workpiece for the first time and would lead to a rougher surface finish being created and a shortened tool life. This is the first time that cutting tool manufacturers will be able to see a Magnetfinish machine here in the UK.

Tschudin will be giving its new proLine CNC Centreless Grinding machine its UK debut. Like other machines within the Tschudin range, it benefits from a unique axis arrangement that sees the work rest blade being mounted onto its own CNC axis. This allows components to be loaded to the centreless grinding machine outside of the working zone of the machine. This

feature is highly attractive for those looking to meet health & safety obligations, because otherwise the hand loading of parts to centreless grinding machines can be dangerous.

The Tschudin proLine machine additionally features a world-first and patented 4th CNC axis to automatically move the regulating wheel vertically, to eliminate the need to adjust the work rest blade height to keep part geometry consistent throughout the entire grinding process. Thus, operators no longer need to worry about wheel wear and to manually adjust to compensate for it. Similarly, when changing to a new workpiece, the part programme can be recalled along with the optimum pre-selected and pre-defined grinding point and the regulating wheel will position itself automatically. This is an important advantage as it allows for much faster setup times and also for millions of parts across multiple batches to be machined to the same pre-defined condition without the need for operator input.

The Tschudin proLine centreless grinder will plunge grind parts with a length of up to 280 mm and with diameters from 0.1 mm up to 180 mm. It has a 410 mm diameter grinding wheel and weighs 10,000 kg with its bed and spindle blocks made from natural solid granite.

FLP fine grinding, lapping and polishing machines will also be exhibited in the UK for the first time. The broad range of FLP



Tschudin proLine grinding zone

machines includes both twin wheel - double sided CNC lapping machines as well as single sided lapping machines. Visitors to the AGS stand will see a relevant single sided machine from the latest FLP range with engineers invited to attend to discuss their requirements for the face machining of components.

FLP Double Disc or twin wheel machines have seven machines in the range offering a working disc diameter of between 540 and 1,300 mm. These are fitted with Siemens PLC controls, can all be offered with full automation via linear or robotic solutions and weigh between seven and 16 tonnes. These advanced machines are offered as high-precision versions with granite machine beds and the latest machine controls, drives and measurement technology. FLPs machines are in use across many branches of engineering, including automotive, aerospace, bearings, optics and ceramics.

Applications include the production of pump, bearing seals, fuel injection and transmission components. FLP machines ensure that components are produced to the closest possible tolerances and at the highest production rates. Operator friendly simple machine operation is ensured as is the lowest cost per machined component. FLP also manufactures in excess of 15 million parts a year for customers needing a subcontract facility. This comprises flat honing, fine grinding, lapping, polishing and deburring of components, including full process documentation, measurements and statistics. FLP will be exhibiting in the UK for the first time.



Sample parts made on FLP machines

Automation is now one of the most important topics for all manufacturers due to the need to fully automate production cells to remain competitive. The Handlingtech range of loaders is suitably

comprehensive, with FANUC or Staubli robots being used for handling parts from 1 g up to 700 kg. These are very versatile systems and are suited for loading a variety of machines. Various component storage solutions are available including the use of pallets, bowl feeders and conveyors. Siemens controls are used with software links to the donor machine's own control system for seamless handling tasks. In order to "add value" to the loading equipment, it is common for Handlingtech to incorporate other processes within their loaders, such as automated measuring and checking via a variety of gauges and cameras and also automatic washing, cleaning, drying, deburring, assembly, laser marking and packing.

Chris Boraston of AGS comments: "Most of the machines that we sell into the UK are automated and as each year passes it's clear that the need to automate increases further. This, combined with the need for loaders to incorporate other technologies such as washing, deburring, measuring or assembly, has meant that today loaders have become machines in their own right and it's now not uncommon for the loaders that we sell to do more, and therefore be more complex than the actual machines that they service. It's all about adding value to the load/unload process to reduce manufacturing costs and to reduce work in progress".

Specialists from Krebs & Riedel will be present on the AGS stand to discuss all grinding applications and best use of their range of internal and external grinding wheels. Krebs & Riedel manufactures high quality conventional, diamond and CBN abrasives and is constantly introducing new types of wheels with improved grain structures and novel bonding systems that enhance grinding wheel quality and optimise performance. Companies involved in grinding are invited to meet the Krebs & Riedel specialists and to discuss their grinding issues and aims to improve their grinding processes.

Apart from offering high stock removal rates to improve cycle times, combined with more consistent part quality by avoiding micro-cracks in the surface of sensitive parts, another large benefit of using Krebs wheels



HT loader

lies in large cost savings made possible by reducing wheel dressing requirements. This has the three major advantages of lower wheel waste due to less dressing, faster cycle times as wheels can be kept grinding longer in between dressing them, and a reduced spend on expensive diamond rollers. Krebs and Riedel is developing new



Krebs Multo grinding wheels

wheels all the time and these are added to the existing collection of over 60,000 different wheel types that are available from them. With such a huge variety of wheels, of course choosing the correct and most efficient wheel is no easy task, but customers can draw upon the experience of Krebs application engineers to arrive at the best one for the customer's specific application.

The range of grinding and finishing machinery receiving its UK debut can all be seen on the AGS stand.

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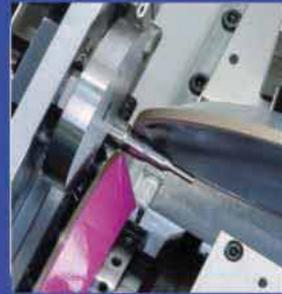


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Vollmer UK tools up for MACH with Vgrind premiere

At MACH 2018, Vollmer UK will be taking cutting tool and saw blade production to a new level with the UK exhibition premiere of the latest Vgrind 360 tool grinding machine and the Loroach K850-M for processing metal-cutting saw blades.

The world-leading innovator in grinding and erosion technology for saw blade and cutting tool production will be giving a UK exhibition debut to the Vgrind 360. The next generation Vgrind 360 is the successor to the Vgrind 160 model, now equipped with enhanced travel distances for accommodating carbide drills and milling cutters, whose blanks are made from either solid carbide or carbide-tipped steel bodies up to 200 mm diameter.

With groundbreaking kinematics that incorporate two vertical spindles, the Vgrind 360 allows multi-level machining. This gives customers the facility to produce large numbers of milling cutters and drills quickly and precisely. The Vgrind 360 at MACH will be demonstrated with the HPR 250 free-arm robot loading facility. However, other automated solutions such as the HP 160 pallet magazine to supply up to 272 workpieces for around-the-clock, unsupervised machining are also available.

The Vollmer UK team will also be highlighting the benefit of the two vertically arranged spindles over competitor machines that operate with a single spindle or horizontal double spindle. The vertical arrangement from VOLLMER improves

precision as the cutting tool is only ever machined on the fixed bearing side of the grinding wheel set. Furthermore, the grinding wheel set is always located on the C-axis pivot, drastically improving the precision of the sharpening process. With this configuration located upon a polymer concrete foundation, unparalleled damping and vibration characteristics are guaranteed. All this ensures the new Vgrind 360 delivers far superior surface finishes and accuracy for cutting tool manufacturers.

As far as productivity is concerned, the VGrind 360 achieves perfect interpolation through five perfectly harmonised CNC axes that have short travel distances and swivel ranges for all axes. This reduces processing times as non-productive times are slashed. Furthermore, the two grinding spindles can be loaded with different tools, while an optional tool magazine with eight grinding wheel packages allows tools on the vertical spindles to be automatically changed. The innovative new Vgrind 360 utilises the NUMROTOplus software system, that offers extensive options for the production and re-sharpening of tools.

If you are involved in the production or sharpening of saw blades or rotary cutting



tools, VOLLMER has an unparalleled reputation for quality, innovation and service that will be on show at MACH. With three machines making a UK exhibition debut, visit the Vollmer UK stand to see why the world's leading cutting tool manufacturers are choosing VOLLMER as its preferred productivity partner.

With its comprehensive range of machinery, the VOLLMER Group, which has sites in Germany, Austria, Great Britain, France, Italy, Poland, Spain, Sweden, the USA, Brazil, Japan, China, South Korea, India and Russia, enjoys global success as a specialist in tool machining in the Production and Service divisions. The technological leader's range of products contains the most advanced grinding, eroding and machine tools for rotary tools, circular saws and band saws in the wood and metalworking industries. In offering this, VOLLMER relies heavily on tradition and the company's strengths: Local branches, quick decisions and rapid action by a family-run company. The VOLLMER Group currently employs approximately 750 workers worldwide, with around 550 of these at the main headquarters in Biberach alone, including more than 50 trainees.

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Innovative abrasive technology from Austria

International abrasives manufacturer TYROLIT will once again be represented at MACH. The Austrian specialist will exhibit selected product innovations for the aerospace, medical and automotive sectors as well as a focus on Industry 4.0

MACH has grown steadily as a leading trade fair for grinding technology and now offers over 600 exhibiting companies, attracting over 25,000 visitors across the 5-day event. A staggering £150 m of business was attributed to MACH 2016 and 2018 promises to be bigger and better with new zones, innovative technologies and a vibrant seminar programme.

On its 64m² stand, TYROLIT will present a large number of innovative products from the Metal Industries business unit. With Industry 4.0 as a focus, this year TYROLIT will place special emphasis on the ToolScope service package. In the area of grinding applications for universal machining centres, the elegant concept of supplying coolant through the grinding wheel and the assortment of grinding tools for these applications will be presented. Visitors are encouraged to visit the TYROLIT stand in Hall 6, in order to see the countless product innovations for themselves.

ToolScope - a comprehensive Industry 4.0 solution for machining

TYROLIT is setting a milestone for the digitalisation of grinding technology together with KOMET® BRINKHAUS, its partner in the area of Industry 4.0. The ToolScope assistance system is a comprehensive system solution for machining. ToolScope creates measurable added value for customers through increased process transparency and numerous process optimisation options. Each machine can be set up with a minimum of effort within a very short time and subsequently allows customers to save costs and time as well as to ensure constant process quality. The ToolScope assistance system has a modular structure, with individual licenses possible for individual applications.



ToolScope key visual

MIRA Ultra SF

TYROLIT developed the MIRA Ultra SF product line specifically for superfinishing during the continuous generating gear grinding. With the innovative 2-zone worm grinding wheel, pre-grinding and finish grinding as well as superfinishing can now be performed using one worm grinding wheel. The worm grinding wheels are approved for a cutting speed of $V_s = 80$ m/s. The MIRA Ultra SF will be available for sale from mid-2018.



MIRA ULTRA SF

MIRA ICE BK

MIRA ICE BK, the tried-and-tested grinding wheel for large gear grinding, has been further optimised based on the market-leading product line of BURKA-KOSMOS in cooperation with experienced TYROLIT experts, and is setting standards throughout the industry.



MIRA ICE BK

POLARIS LW

TYROLIT is leading the area of lightweight construction in electroplated grinding tools. Weight reductions of up to 50 percent can be achieved through targeted material reduction. This lightweight variant reduces maintenance intervals and greatly



Polaris LW



DMG universal machining

simplifies handling for personnel. The stock removal rate at the core is not random but is calculated using a computational FEM analysis (Finite Element Method). This means that deformations and potential performance losses can be ruled out. TYROLIT's patent for its innovative core structure is pending.

Grinding tools for universal machining centres

A further trade fair highlight from TYROLIT is the option of grinding operations in universal machining centres. One workpiece mounting enables the highly precise profile and surface requirements to be achieved on the same machine through grinding finishing after the turning and milling process. The cooling

lubricant is applied through the grinding wheel or is introduced at the grinding gap through the specially developed grinding wheel holder. This use of grinding tools on universal machining centres allows customers to achieve the required surface finishes with maximum cost-effectiveness.

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New Filtermist acquisitions make MACH debuts

Telford-based industrial air extraction and filtration specialist Filtermist will be showcasing the wide range of products and services available through its newly acquired divisions Multi Fan Systems and Dustcheck Ltd at MACH 2018.

Filtermist's own brand of oil mist filters are well-known amongst UK manufacturers, but perhaps less well-known are the company's additional capabilities, as managing director James Stansfield explains: "At the last MACH show, we focused on highlighting our ability to offer a full turn-key service for centralised extraction systems for a range of contaminants including smoke, fume and dust.

"We've taken huge strides since then, mainly by acquiring other companies, and we are now in a position to offer comprehensive, effective removal for almost any type of airborne contaminant. This includes solvents, odours, VOCs – basically anything that pollutes workshop air."

While Filtermist has exhibited at MACH for many years, 2018 will be the first time Multi Fan Systems and Dustcheck will have taken part in this particular show. "Having Dustcheck and Multi Fan on board means we are able to target a wide range of new markets, but MACH is very much focused on Filtermist's core market, engineering and manufacturing firms that use machine tools," continues James Stansfield. "Both companies offer a range of products and services to this sector and people that know Filtermist may be surprised to find out exactly what we now offer.

"We're looking forward to showing customers how we can help them make sure their people are protected from a wide range of hazardous airborne substances."

While the 2018 stand is designed to highlight Filtermist's wide-ranging capabilities, the ambitious company won't be throwing the baby out with the bath water, as Stuart Plimmer, Filtermist director of sales, testifies: "The UK oil mist filtration market is incredibly important for Filtermist. We recorded another record-breaking year in terms of sales last year and we're confident that this trend will continue.

"As well as ensuring we're the go-to supplier for any oil mist extraction related requirements, we're also pushing our after-sales support extremely hard. We've employed six new engineers since the last MACH and will be recruiting at least another three this year. Our skilled engineers offer responsive and reactive maintenance throughout the whole of the UK, and we also provide CoSHH compliant LEV Testing to ensure systems are extracting as intended."

Multi Fan Systems

Multi Fan Systems designs and installs air movement and air pollution control systems for a range of customers, including a number of well-known automotive manufacturers. The company, which was established in 2001, prides itself on developing long-term relationships with clients by adding value wherever possible.

Multi Fan director of sales, Kevin Hood elaborates: "We work on an ongoing basis with lots of our clients. They come to us with an initial specific requirement and then once we've shown what we are capable of and they realise the breadth of services we offer, they will then ask us to assist with other industrial air projects."



Fume extraction, VOC Abatement and Ventilation and Cooling, are just some of the services offered by Multi Fan. Visit www.multifansystems.co.uk to find out more.

Dustcheck Ltd

Dustcheck designs and builds a range of dust filters to meet the needs of all aspects of the metal production and manufacturing industries. All filters come with ATEX options, meaning volatile products can be handled safely.



Dustcheck director of sales, Pete Dawson comments: "Dust can cause all manner of problems in the workplace and depending on the product being handled, can cause some significant health hazards for operators, COPD being one of them. Sometimes, the high value of the material being processed means that there can be a need to reclaim the filtered product. As well as protecting workers and dust reclamation, reducing housekeeping and preventing costly breakdowns can also be a consideration.

"2018 is a major milestone for Dustcheck as it celebrates its 40th anniversary in manufacturing and supplying effective dust control for manufacturers of all sizes and we're looking forward to meeting MACH visitors to discuss their dust control needs." Visit www.dustcheck.com for more details.

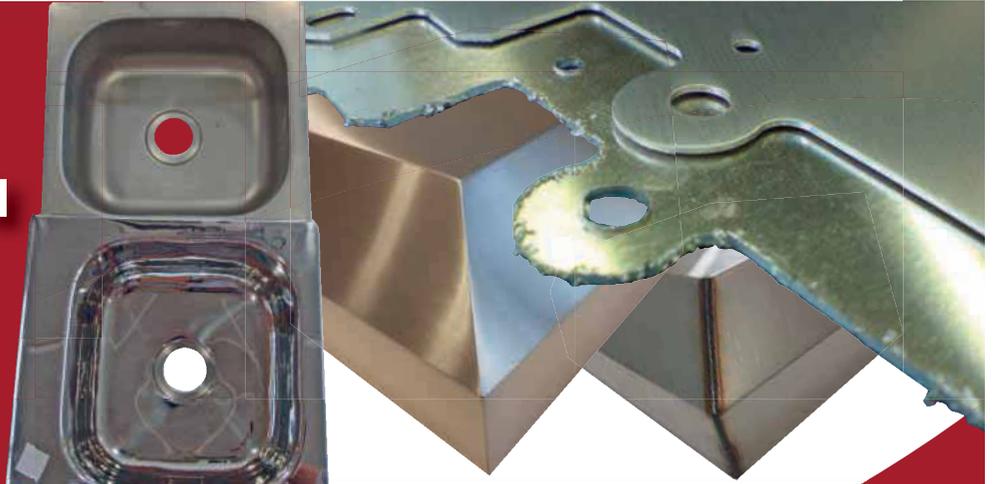
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Oelheld returns to MACH with new product lines

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innovative fluid technology

Making its return to MACH after a 10-year absence, Oelheld, the specialist in metalworking fluids, water-soluble lubricants and filtration and extraction systems, will introduce a host of new product lines to visitors.

Specialist in the provision of high-end oils for grinding and EDM processes, Oelheld will introduce its latest generation of high-performance SintoGrind grinding fluids, the new GTL (Gas to Oil) base oil. This revolutionary refining process converts natural gas or other gaseous hydrocarbons into longer-chain hydrocarbons. Converting methane-rich gases into liquid synthetic fuels significantly improves performance, stability, longevity and surface finishes while removing hazardous elements and reducing grinding wheel wear.

The new GTL range to be introduced at MACH will include the SintoGrind TC-X 630 oil for grinding centres. This product has been specified for tool production and, in particular flute and profile grinding as well as external and internal diameter grinding.

Complementing the TC-X 630 at MACH is the new SintoGrind IG 540 suitable for manufacturers processing tungsten carbide, HSS, PCD, CBN, cermet and ceramic materials. This new flagship product has been formulated for demanding grinding operations that undertake extreme feed and speed rates. The lubricity of the SintoGrind IG 540 extends grinding wheel life and minimises heat generation, which eliminates surface cracks and burns.

Alongside these new brands making their debut at MACH will be the ToolGrind TC-X 620. Based on additive technology, the TC-X 620 is formulated with highly refined base oils that demonstrate astounding viscosity and temperature characteristics with a low aromatic content and misting. Capable of performing under extreme pressure, the ToolGrind TC-X 620 guarantees favourable cooling and lubrication while containing no chlorine, silicone or heavy metals.

Complementing these innovative and

environmentally friendly fluids at MACH will be established fluids such as the SintoGrind TTK, that has proven itself as an industry leader in tool grinding applications on tungsten carbide, HSS, steel, PCD, CBN, cermets and ceramics. The constituents of this marquee brand also make it an industry leader for grinding components in the aerospace, medical and wear part sectors.

This mainstay of the Oelheld family will be accompanied by the SintoGrind SI. This fully synthetic high-tech product has been manufactured with Poly-Alpha-Olefins for the grinding of glass and technical ceramics. SintoGrind guarantees faster machining with less tool wear, as it has been designed in conjunction with machine tool manufacturers to reduce foaming and filtration problems.

MACH 2018 will also see the launch of the Indusa air filtration, oil mist and dust extraction brand. Making its UK premiere, the Indusa line-up includes the Elstar electrostatic separator range, the Mestar mechanical air filter series, the Dustar dust filtration units and the Vlittec media filters. In addition, the high-quality Indusa range incorporates centralised exhaust air and filter concepts, the Contral plant control system, cyclone separators, suction collectors and exhaust collectors as well as a variety of pre-filters, electrostatic precipitators, fans and silencers.

Complementing the Indusa range on the Oelheld stand will be the Vomat FA240 fully integrated filtration and cooling system for fluid management. The compact stand-alone 1,600 by 1,000 by 1,200 mm unit has a 13 kW cooling performance and a filtration rate of 240 litres per minute. Ensuring fully automatic collection of recyclable material with residual moisture of less than 5 percent to 10 percent and a

filtration grade of 3 to 5 µm, the Vomat FA240 provides user-friendly waste disposal.

Oelheld will also be demonstrating the Hirschmann tooling and workholding range at MACH in the shape of the Hirschmann 4000 and 9000 series of fixturing systems for component clamping on wire electrical discharge machines.

The Hirschmann range of rotary axis indexing tables will also be shown at MACH. The stainless-steel rotary tables demonstrate pin-point precision with a repeat accuracy of +/- 1second and a positional accuracy of +/-2seconds.



For further details on the extensive range of Oelheld fluid solutions, the Indusa and Vomat environmental and extraction management systems, as well as Hirschmann workholding solutions, contact:

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Master Abrasives to exhibit complete grinding solutions at MACH

Internationally-recognised abrasives supplier Master Abrasives will be exhibiting at MACH, presenting a grinding machine by Micromatic Grinding Technologies alongside measuring equipment, abrasives and superfinishing devices.

This will be the first time Master Abrasives has exhibited at MACH for several years and the company has made many strategic changes since then. One significant development is the appointment as Micromatic Grinding Technologies sole distributor in the UK and Ireland. With a showroom equipped to demonstrate the machines' capabilities, Master Abrasives is now offering a cost-effective and reliable option for hydraulic and CNC cylindrical, centreless and special purpose grinding machines.

Master Abrasives will also be displaying the Micromatic eco 200 machine on its stand in the Grinding Zone located in Hall 6.

The machine being presented at MACH, the eco 200 is a basic but high-precision grinder, which can be used for external, internal or face grinding applications. The machine is available with a range of additional accessories offered by Micromatic, including the digital read-out. Its small footprint and low-cost combined with its ability to hold tight tolerances make it a great economical entry model machine for tool rooms requiring precise and accurate repeatability of wheel slide within ± 0.001 mm.

Another new partnership with Thielenhaus Superfinish Innovation AG allows Master Abrasives to offer a complete solution to superfinishing applications with tape finishing devices as well as precision microfinishing films from other brands. The SL50 tape finisher has been set up in the Master grinding and finishing showroom since December and will be available for show on the Master stand at MACH.

The SL50 device has a double-side mounted tape contact roller, is equipped with sensors and can be integrated directly into a machine. It has an oscillation frequency of 300-1,400 double-strokes per minute. The device provides manufacturers with the opportunity to cost-effectively apply precision machining methods to

individual parts, small batches and prototypes using an existing supporting machine, for example a lathe or grinding machine. This allows manufacturers to achieve high-quality surfaces and geometric improvements on components such as gear shafts, rolls, piston rods and many others. They can be operated manually or using a programmable control unit, depending on requirements.

New high-power air tools for grinding applications

ZIPP Group has launched a new range of high power air tools for grinding applications. Master Abrasives, the UK distributor for ZIPP tools, is offering the 4 newly introduced die grinders from stock.

The ZDG-301 0.9 HP air die grinder is suitable for many automotive and industrial grinding, deburring and finishing applications. The grinder can be used to clean dies, rotors, backing plates and brake pad mounts. It can also grind valve seats, dress welds and enlarge holes and is compatible with Master shank mounted abrasive products such as mounted points and carbide burrs. By using 6 mm or 3 mm collets a wide range of grinding accessories can be used for a wide range of applications.

The ZDG-301AL 3.5" 1HP air extension die grinder is an extended version. This new tool features an extended reach of 3.5".

The ZDG-301L 5.5" 1HP model features a further extended reach of 5.5" for



application in hard-to-reach areas using Master Abrasives shank mounted range of abrasive products.

The ZDG-302 0.9 HP is the right angle die grinder version and again is suitable for deburring and finishing applications. It is the ideal tool to use with abrasive quick-change discs which are available in the Master range of products.

Since last participating in MACH, the Master brand has been expanded and strengthened to satisfy customer needs more effectively. Master Abrasives still offers a full range of grinding wheel specifications and dressing tools for a range of applications, but also now available is the economical range of wheels in storage cases which come complete with changeable plastic bushes to reduce bore size. In addition to new products, Master Abrasives has updated its literature in line with its brand's new look.

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Kemet celebrates 80th anniversary with new machines at MACH

As well as celebrating its 80th anniversary this year, precision surface finishing specialist, Kemet will be launching several new machines this year at MACH 2018.

The Kemet TwinLap 50, a small but versatile bench mounted, double sided lapping machine, ideally suited for small workshops and laboratories, comes fully equipped and ready to use. It is suitable for lapping components up to 52 mm diameter (2") and up to 10 mm thick, while a larger version, the TwinLap 120 is available for larger components. The machine will operate with a variety of abrasives including Kemet's ISO 9001: 2015 certified Diamond Compound fed onto the lap plate by a peristaltic pump.



The Kemsonic 3 in 1 Hand Grinding/ Polishing Unit, with ultrasonic, rotary and reciprocating hand pieces, offers everything you need in one space saving control unit.



With state-of-the-art ultrasonic technology, the unit provides automatically adjusted frequency up to 45 watts output with 30,000 stokes per second, and variable stroke length between 3 and 40 µm. A brushless micromotor provides up to 300 watts of power with three speed ranges: 1,000-15,000, 15,000-30,000, 30,000-50,000 rpm and reversible rotation of the 2.35 mm diameter collets. Last but

not least, the reciprocating power- hand motors complete the micromotor system.

Also on display will be a Versa Genius 50 ultrasonic cleaning system, the smallest of the modular range produced by world renowned ultrasonic machine specialists, Finnsonic. It offers a small footprint system that can grow with customers' requirements, from a single ultrasonic tank to a multistage automatic line with features such as Ultrasonic Boost, Sweep and Degas technologies as standard.

As always, Kemet continues to offer lapping, polishing and cleaning trials to establish the optimum process for customers' components and provide demos and training in how to repeat these at their own facilities. For more information contact:

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Vibratory finishing spans a multitude of applications

Family-run PDJ Vibro, a leading provider of vibratory bowls, troughs, associated consumables, technical consultancy and subcontract finishing, will focus at MACH on the depth of experience and expertise it offers to customers. Now in its second generation and run by managing and technical directors David and Paul Hurley respectively, the company was established in 1983 by their father John, the current chairman.



With an eye to succession, passing this knowledge down to David's son Tom and Paul's two sons, James and Adam and acclimatising them to the world of manufacturing will form an important part of the event. All three third-generation family members will be in attendance during this year's show, Tom having made his MACH debut in 2014.

Another theme of the stand will be to communicate the advantages of eliminating hand finishing, namely reduced labour costs and scrap, less reworking and increased consistency of finish compared with processing parts by hand. Interested parties are invited to visit www.vibratoryfinishing.co.uk/cost-calculator.html to find out how much this repetitive and unpopular job is actually costing.

Two further topics will be highlighted. One is PDJ Vibro's ability to deliver competitively priced, high quality equipment quickly ex-stock from the company's Bletchley showroom and technical centre, together with the requisite consumables. The company also provides a machine replacement service if the customer's original choice of bowl or trough was not optimal or their requirements change.

The other area of focus will be the vast range of components that can be efficiently and safely processed using the vibratory process. Anything from rusty old chains to



parts machined to extremely tight tolerances are suitable candidates for vibro finishing. As the latter may not be generally appreciated, a number of case studies will be cited where PDJ Vibro equipment is being used to automate the finishing of very high precision components, without surface damage or dimensional change.

Technical centre consultancy

At PDJ Vibro's technical centre and demonstration facility in Bletchley, visitors can see 120 new and used machines for immediate delivery, with part-exchange offered in most cases.

The company's main, high-end vibratory bowl range has process chamber sizes from 7.5 to 6,000 litres, while three competitively priced, entry-level models have capacities of 300, 150 and 75 litres. Rectangular troughs in 13 sizes with capacities from 22 to 2,200 litres are the preferred choice for finishing larger prismatic items and those made from sheet metal.

Over 6,000 varieties of consumable including ceramic and porcelain media, superfinishing compounds, liquid detergents and chemicals are also available, 100 tonnes of which are held in stock.

PDJ Vibro's problem solving goes further than just advice on the best choice of vibratory equipment for everything from deburring, edge breaking, radiusing, superfinishing, degreasing, rinsing and drying to pretreatment for anodising,



chemical blacking or painting. Nine out of 10 people bring in sample components to be finished on a free trial basis, so they can see the process in action and its effectiveness. Many parameters are taken into account, including the number of parts to be finished per batch, frequency of production, drainage and noise issues, the size of components and how vulnerable they are to impingement damage.



Another strand of PDJ Vibro's service designed to make life easier for customers is the 24/7 subcontract vibratory finishing and polishing service in a unit adjacent to the company's showroom. It is ideal if there is a temporary bottleneck in finishing capacity at a manufacturer, or if the firm decides that it does want to undertake on-site finishing. Component batch turnaround at the Bletchley centre is typically within 24 hours. A collection and delivery service is provided, but customers can arrange their own transportation if preferred or even wait for the parts to be ready.

Upgrades to existing vibratory equipment in the field can also get customers out of trouble if applications change. Perhaps automatic component separation is needed to boost productivity, or an acoustic cover needs to be retrofitted to meet health and safety requirements, or an increase in throughput means that a machine becomes too small and needs to be swapped for a larger model. All of these scenarios are factored into the service offered by PDJ Vibro.

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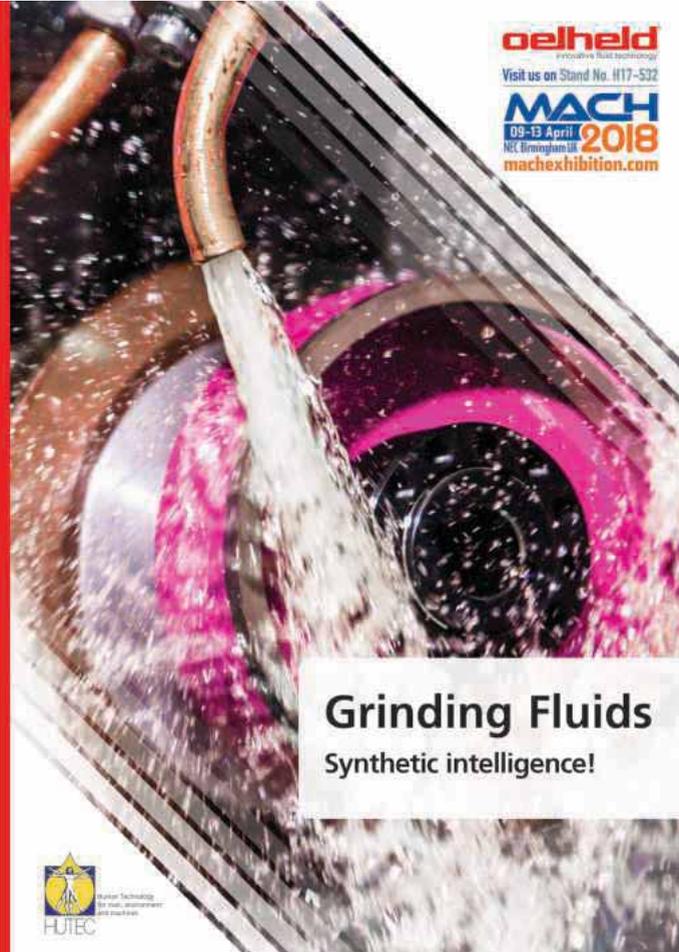


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PBR Abrasives is one of the UK's largest independent suppliers of specialist precision grinding wheels, coated abrasives, diamond and super abrasive products and is skilled in providing technical solutions to the UK's engineering and manufacturing sector.

In addition to one of the widest ranges of standard and non-standard stock items, PBR Abrasives has its own in-house grinding wheel conversion unit where standard stock items can be machined into non-standard items within 24 hours. With four specialised short bed lathes, wheel diameters or thicknesses can be reduced, recesses added, centres opened and specific profiles applied. This service offers great flexibility to manufacturers and engineering companies who are looking for small quantities which would otherwise be cost prohibitive to manufacture from scratch, not to mention the long lead times that would apply.

PBR's core range is precision vitrified and resin-bonded grinding wheels, CBN and diamond superabrasives for specialist or demanding applications. Other key products include high performance coated abrasives in belt, disc, wheel, sheet and roll form, together with single point Diaform, chisel and multipoint diamond dressing tools for all types of grinding wheel forming and dressing. It also holds a diverse stock of rubber control wheels to cover all types of centreless grinding wheels.

Recently PBR has developed an extensive range of tungsten carbide burrs which are compatible with all major hand tool brands.



In addition, there is also a commodity hand tool range of products which are competitively priced, quality products available from stock and branded under the Power Flex name.

PBR Abrasives is a UK appointed distributor for many of the world's leading makes of quality grinding wheels and its extensive stockholding of standard items means that it has a solution for most grinding needs. For non-standard manufactured items, it can offer a market-leading service of 4-6 weeks delivery.

Since 1969, PBR Abrasives has been at the forefront of abrasives technology and in 2017 was instrumental in the launch of a new spring grinding development known as the ICE Spring Wheel. Since its launch, this innovative product has proved its exceptional performance characteristics with several leading UK spring manufacturers, in increasing productivity, through a longer-lasting wheel life, cooler grinding, faster stock removal and reduced dressing.

With extensive stocks of all standard products and 24-hour national delivery, PBR is also recognised for its wealth of technical expertise and ability to provide cost effective solutions. With over 100

years' combined industry experience within the PBR team, it is known for its high level of technical competence and knowledge. Customers can benefit from expert advice by telephone or a dedicated site visit.

One of the cornerstones of PBR's business is to facilitate process improvement within the manufacturing and engineering environment. This is achieved through the provision of a world-beating range of abrasives products and technical solutions that increase grinding performance through superior product longevity, reduced downtime and fewer ancillary costs.

Based in the Midlands, with its own transport fleet, PBR can offer next-day or standard 48-hour deliver throughout the UK, Ireland and Europe.

For technical enquiries, email: technicalsales@pbrabrasives.com or for more information, contact:

PBR Abrasives
Tel: 01902 368624
Email: sales@pbrabrasives.com
www.pbrabrasives.com



An attractive presentation

Eclipse Magnetics to showcase working demo of automated filtration unit

Magnetic filtration expert Eclipse Magnetics will have a working demonstration of its fully automated magnetic filtration unit, the AutoMag, on display on its stand at MACH. Visitors will have the chance to witness the Automag's high contamination collection capacity, ability to handle high flow rates, and patented design on the stand.



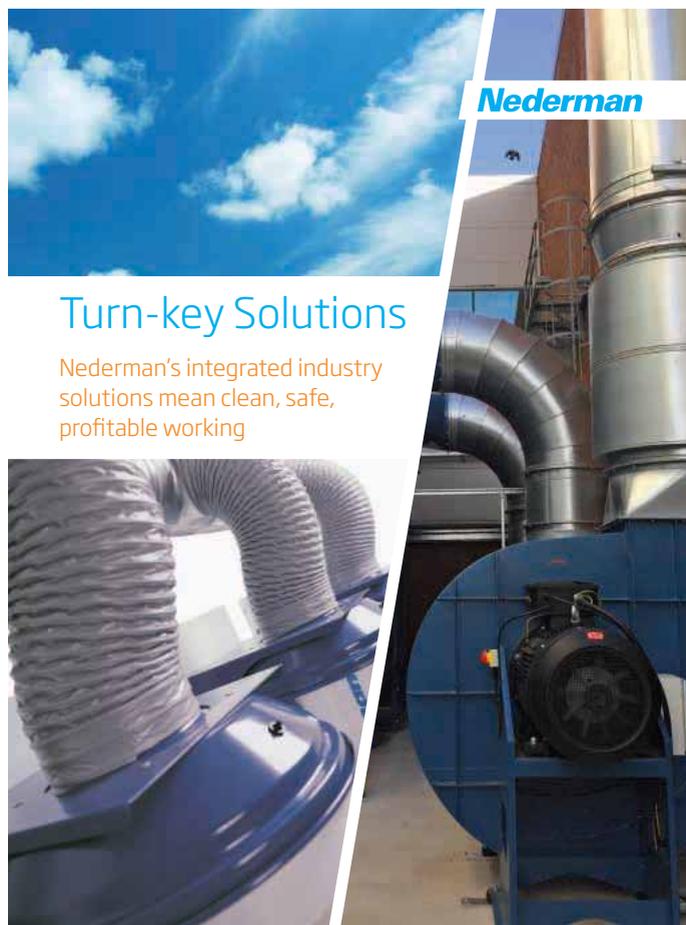
Steve McAllorum, sales and marketing director at Eclipse Magnetics says: "We are delighted to be able to show visitors exactly how the Automag can make significant improvements to the efficiency of machining operations. With a working demonstration on our stand, the MACH exhibition is the perfect opportunity for visitors to find out more about the benefits of magnetic filtration."

The Eclipse Magnetics stand will also feature an extensive range of electromagnets, magnetic workshop tools, welding aids and workholding and lifting products, giving visitors the opportunity to see how Eclipse's considerable expertise in magnetics can solve some age-old industry problems; improving efficiency, quality, and safety in many manufacturing businesses worldwide.

Advanced filtration systems for industrial fluids in precision machining applications are the best way to effectively remove problem ferrous particles from industrial fluids such as coolants, oils, lubricants and wash solutions. They can significantly improve process efficiencies across a range of manufacturing industries, with Eclipse Magnetics supplying some of the leading names in the automotive, bearing manufacture, steel processing, tool cutting and grinding sectors.

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www.eclipsemagnetics.com

MACH • Stand: H20-40



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Nederman

Nederman makes MACH debut

Making its debut appearance at MACH, Nederman, the world-leading supplier and developer of environmental technology solutions for the manufacturing sector, will be introducing no fewer than three of its leading product lines that are certain to generate interest among show visitors.

On show at MACH will be the industry-leading Filterbox line of dust and fume extraction systems. Available as a fixed or mobile unit for 'at-source' dust and fume extraction, the Filterbox is the solution of choice for welding, fabrication and other workshop dust and fume applications. It is equipped with automatic compressed air cleaning and a signal that indicates when it is time to clean or change the filter cartridges.

The Filterbox has multiple fan options for different applications and can be supplied without an extraction arm for connection to extraction ductwork. It has a three-phase power supply and a 3 m extraction arm, as well as a filter cartridge that gives 99 percent separation efficiency for a cleaner, healthier and safer work environment. The Filterbox is available with a host of product

variants that can be supplied to cater for your complete range of dust and fume extraction requirements.

Also at MACH will be the Filtac OMF2000 series of extraction units. Regarded as the most efficient oil mist filtration range for the machine tool industry, the new Nederman Filtac Series is based around Nederman's patent-pending FibreDrain™ technology. Specially designed for continuous operation on turning, milling and grinding machine tools, the new OMF Series will be connected to an oil mist generating 'test-rig' at MACH to demonstrate how effective the OMF series is at removing and controlling airborne oil mist particles within the machine envelope.

With high speed machining and high-pressure coolant both becoming more prevalent in the metal cutting industry, oil mist and smoke from machine tools is increasingly commonplace. To eliminate the negative effect that oil mist has on employee health, productivity, the production equipment and overall business revenue, the Nederman Filtac OMF range of



oil mist filters can deliver a multitude of health & safety, productivity and consumable cost benefits.

For manufacturers that need an industrial vacuum system, Nederman will be presenting its 160E, a lightweight dry vacuum ideal for industrial floor cleaning and on-tool extraction for small grinders and sanders.

Nederman Ltd
Tel: 08452 743434
Email: info@nederman.co.uk
www.nederman.co.uk

MACH • Stand: H17-482

NCMT to showcase Okuma grinding centres

Leading UK machine tool distributor, NCMT will be presenting an array of solutions at MACH 2018, including the new Genos M460V 5-axis vertical machining centre and Genos L3000-MY turning centre from Okuma.

Grinding will also be represented in the shape of the GA26W cylindrical grinder.

The GA26W fast, high-precision, cylindrical grinder is equipped with the multi-touch OSP-P300GA CNC control, which runs on a Windows platform and integrates the machine with the motors, drives and encoders, all of which are manufactured by Okuma. The control and touchscreen increase efficiency by allowing users to toggle between machine operations, programming and wheel preparation screens.

A rigid foundation, paired with Okuma's hydrodynamic wheel spindle, enables heavy-duty grinding, maximum grinding diameter is 200 mm and distance between centres is 400 or 650 mm. The machine is equipped as standard with a chatter control function that automatically adjusts wheel speed for accurate, stable machining, ideal for high accuracy mass production of smaller parts. Use of an NC footstock with 50 mm quill stroke leads to fewer setups, raising productivity in high-mix production environments.

Other key features of the grinder are IGAP+ conversational programming, a large 610 mm diameter grinding wheel up to 150 mm wide driven by a 7.5 kW (optionally 15 kW) motor via a hydrodynamic spindle, wheel rotation accuracy within 0.01 µm and high feed rates of 30 m/min in the X-axis, 20 m/min in Z. Wheelhead

The Okuma GA26W high-precision cylindrical grinder



rather than table traverse gives the CNC grinder a compact footprint that saves floor space, machine width being just over 2.5 metres, the narrowest in its class.

View the GA26W video at
<https://www.youtube.com/watch?v=JczBGBCV-j0>

NCMT Ltd Tel: 020 8398 4277
Email: daveburley@ncmt.co.uk www.ncmt.co.uk

MACH • Stand: H19-640

More Matrix machines at MACH



With a proud heritage of machine tool innovation that stretches back over 100 years, leading UK company, Matrix Machine Tool (Coventry) Ltd has been a leading manufacturer of high-quality thread grinders since 1934. In addition to Matrix Machines' continued popularity in its domestic marketplace, the company currently exports more than 95 percent of its celebrated thread grinding machines.

Encouraged by growing demand from both its UK and global customer base and building on the company's long tradition of producing premium quality manual gear grinders, the busy Matrix R&D team has recently developed an all-inclusive range of seven cutting-edge CNC gear grinding machines.

Four types of Matrix gear form grinding machines are now available, including a continuous generating gear grinder designed for high-volume work. The largest Matrix gear form grinders can machine diameters of up to 800 mm. In addition, two new 5-axis bevel gear grinding and cutting machines have been introduced. Also added to the expanding Matrix range is an

advanced hob grinding and sharpening machine. The launch of this comprehensive range of high-quality gear grinders complements the company's famous thread grinding machines and allows Matrix to offer what is now a broad range of high-quality grinding solutions.

To illustrate the advanced capabilities of the company's new CNC gear grinding line-up, Matrix staff will be demonstrating the MBGC-100 Bevel Gear Cutter at MACH 2018. Although this highly-efficient machine tool was designed to perform the high-volume production of precise bevel gears, its innovative platform and flexible qualities allow Matrix to offer this adaptable machine for a range of other demanding 5-axis applications.

To illustrate the continuing technical progress being made by the company in its traditional field of thread grinding, Matrix staff will be putting two of the company's advanced thread grinding offerings through their paces at MACH. The 0550 External Thread Grinder and the 3060 Internal Thread Grinder boast many of the superior features expected of Matrix machines,

including the renowned ProfileMATE software and absolute encoders that are fitted on all configured axes.

Given the relentless march towards Industry 4.0 and the growing demands of the 'smart factory', Matrix Machine Tool (Coventry) Ltd is now able provide machines as part of fully integrated packages. A range of advanced automation options are available, including robotic load/unload facilities and automated warehouse capabilities. These highly efficient options will be fitted to the Matrix machines being demonstrated at MACH.

Matrix Machine Tool
Tel: 024 76 718886
Email: sales@matrix-machine.com
www.matrix-machine.com



CNC PRECISION THREAD AND GEAR GRINDING SOLUTIONS



Founded in 1913, Matrix Machine Tool (Coventry) Limited is a world-renowned company which has been manufacturing machine tools since 1913. In 2017 Matrix proudly returned to **gear grinding solutions** with the introduction of **7 new machine tools for CNC precision Gear Grinding**. All machines are built at the Coventry factory using traditional methods of manufacture and feature powerful Siemens controls and feature-rich custom software to facilitate programming and usability. Our machines are fully flexible, but are shipped as a turnkey solution ready for immediate production upon delivery, after installation and training. Matrix now offers machine tool solutions for both Thread and Gear Grinding requirements.



**Matrix CNC
 Gear Grinding
 & Cutting
 Machines**



**Matrix CNC
 Thread
 Grinding
 Machines**



**We look forward to meeting you
 at MACH 2018 Hall 17 Stand 427**

MATRIX MACHINE TOOL (COVENTRY) LIMITED

www.matrix-machine.com

Milling, turning and grinding in a single setup

Machine tool manufacturer DMG MORI has announced that grinding can be integrated into three sizes of 5-axis mill-turn centre in the company's duoBLOCK FD series, the largest of which has 1,600 × 1,600 × 1,100 mm linear axis travels.

The addition of grinding on the same machine platform will be of interest to manufacturers wishing to take advantage of single setup metalcutting to preserve dimensional accuracy and combine it with high quality surface finishes down to 0.4 µm achievable with grinding.

Sizes 80, 125 and 160 in the duoBLOCK FD series, both the DMU and the DMC pallet-change version, can be equipped with grinding capability, in which case the machine designation carries the suffix FDS. DMG MORI technology cycles in the machine control for internal, external and face grinding support the processes and there is a specific cycle for calibration of the grinding wheel truing station. New wheel diameters can be defined automatically.

New also is an acoustic sensor that detects the initial contact between the grinding wheel and the truing unit, ensuring reliability and accuracy. The first contact between the grinding wheel and the component is determined via the spindle load meter.

Additional measures have been taken to protect the ballscrews and scales from ingress of particles from the grinding processes. The 1,300-litre capacity coolant unit has been equipped with a centrifugal filter that separates particles finer than 10 µm.



The DMC 80 duoBLOCK FDS mill-turn-grind centre from DMG MORI is based on the company's 5-axis, twin-pallet-change machining centre platform

DMG MORI UK Tel: 024 76 516120

Email: steve.finn@dmgmori.com www.dmgmori.com

MACH • Stand: H20-490

Fine surface finishes are no longer a grind with Ajax

Ajax Machine Tools has now introduced its impressive line of AJG cylindrical grinding centres for high precision finishing of round parts. The extremely reliable, precise and robust grinding centres are offered with four dimensional sizes to meet the various demands of the marketplace.

The four variants of the new AJG range include the AJG27, AJG30, AJG35 and AJG38 with the numeric designation signifying the maximum swing over the bed of 270 to 380 mm. Cost-effective, easy to use and with an intuitive control panel, the AJG Series is ideal for subcontract machine shops, educational establishments and end users that demand the utmost in precision and high-quality surface finishes or for manufacturers processing hard materials. The machine with the smallest swing over the table, the AJG27 is available with a distance between centres of 350, 550 or 750, while the AJG30, AJG35 and AJG38 can accommodate part lengths up to 1,000 mm, 550/750 mm and 1,000 mm respectively. With a spacious swing and length capacity, the various machines can

process parts of 250, 280, 330, and 360 mm diameters with a maximum loading capacity from 60 to 150 kg.

The wheelhead on the AJG Series is capable of swinging +/-15 degrees to the right and left whilst the in-feed travel is 250 mm, a dimensional travel that can be controlled automatically or via the ergonomically positioned hand wheels. The precision level of the AJG Series is particularly impressive with an automatic in-feed increment of 0.001-1.8 mm with a handwheel movement per division of 0.005 mm.

The AJG Series combines precision with power, demonstrated by the 3.75 or 5.6 kW motor that provides a grinding spindle speed of 1,650, 1,850 or 2,100rpm. The grinding wheel on the AJG Series has a diameter of 405 mm with a width capacity for wheels from 32-50 mm on the smaller AJG27 and AJG30 machines with 38-75 mm on the larger more robust AJG35 and AJG38 cylindrical grinders. The machine table has a swivelling angle of 6-9 degrees



with a variable traverse speed from 50 to 4,000 mm/min.

For further information on this impressive series of cylindrical grinding machines, contact:

Ajax Machine Tools International Ltd

Tel: 01590 676000

Email: sales@ajax-mach.co.uk

www.ajax-mach.co.uk

MACH • Stand: H6-42/H6-44

Freddy gives Micro Plus world premiere at MACH

Freddy Products will return to MACH in 2018 with the launch of its latest member of the Freddy Coolant Recycling Vacuum family, the Micro Plus. Freddy Products will be introducing the Micro Plus, which will be shown alongside a selection of industry leading coolant recycling vacuums and swarf vacuums.



The new Freddy Micro Plus has a remarkably small footprint, a 50-litre capacity, outstanding versatility and a lightweight design. The innovative design is complemented by castors that give the end user unparalleled mobility, flexibility and ease-of-use. Unlike many alternate systems, the Micro Plus doesn't use fragile and often unreliable submersible pumps that take up valuable tank capacity and make it incredibly difficult to thoroughly clean.

This gives the new machine the ability to take on heavily contaminated liquids without damaging parts or machinery that the Micro Plus comes into contact with. The airflow is switched from vacuum to a pressurised flow and forces collected liquids out of the holding tank. You can now recycle and clean 50 litres of coolant through the Micro Plus and return the fluid to the sump of the machine tool in less than 60 seconds. This astounding speed is credit to the new pump design that can pump fluid efficiently from machine tools rather than use a gravity drain that is commonplace on competitor units of comparable capacity. This makes the Freddy Micro Plus the ideal solution for smaller businesses and subcontract machine shops that may be limited on space and storage capacity.

The extremely compact and robust new powerhouse incorporates a 2 kW motor that efficiently pumps fluid and residue into barrels, IBC's and even overhead storage tanks. With the option of either a 240 Vor 110 V power source, the motor can generate an airflow rate of 3,000 m³/hr with a water in-flow rate of 238 litres per minute and an outflow rate of 100 litres per minute.

Like other models in the extensive Freddy Products range, the Micro Plus recycles fluids and coolant through a filter bag. Depending upon the customer applications and requirements, Freddy engineers can provide the ideal fit for your business with filter bags from 1,000 µm down to 5µm to ensure that even the finest of particulate and contaminants are captured.

The new Freddy Products Micro Plus is supplied with a 38 mm hose and gulper as standard, with the option to upgrade to a 51 mm hose if required.

Freddy Products Ltd Tel: 01386 561113

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STUDER unveils world premiere at GrindTec

STUDER unveils new machine for long workpieces

STUDER chose GrindTec 2018 as the perfect opportunity to unveil its new universal machine, the favorit 1600 with a centre distance of 1,600 mm (63 inches) with the capability to handle long workpieces. As with all STUDER cylindrical grinding machines, the proven Granitan® machine bed ensures the legendary precision. The wheelhead, which can be automatically positioned every three degrees, can take one belt-driven external and internal grinding spindle respectively.

Other features include: height of centres; 175 mm; maximum workpiece weight between centres 150 kg; cross slide (X-axis) maximum travel 370 mm; longitudinal slide (X-axis) maximum travel 1,750 mm.

This CNC universal cylindrical grinding machine is designed for grinding both single part and series production and can be fitted with automation. With various options such as measuring control, balancing system, contact detection and longitudinal positioning, it can be subsequently adapted to other grinding tasks.

The full enclosure provides an optimal view of the grinding process. The wheelhead, which can be automatically positioned every 3°, can accommodate a belt-driven external and internal grinding spindle.

Thanks to the practice-oriented STUDER grinding software, with its proven Studer-pictogramming, even less experienced users can program grinding and dressing cycles quickly and efficiently. With the optionally available StuderGRIND software, special applications, such as profiling the grinding wheel for complex workpiece shapes, can be efficiently programmed. Development, production, assembly and testing of the STUDER products are process-oriented and comply with the strict guidelines of VDA 6.4 and ISO 9001.

WireDress - the new generation

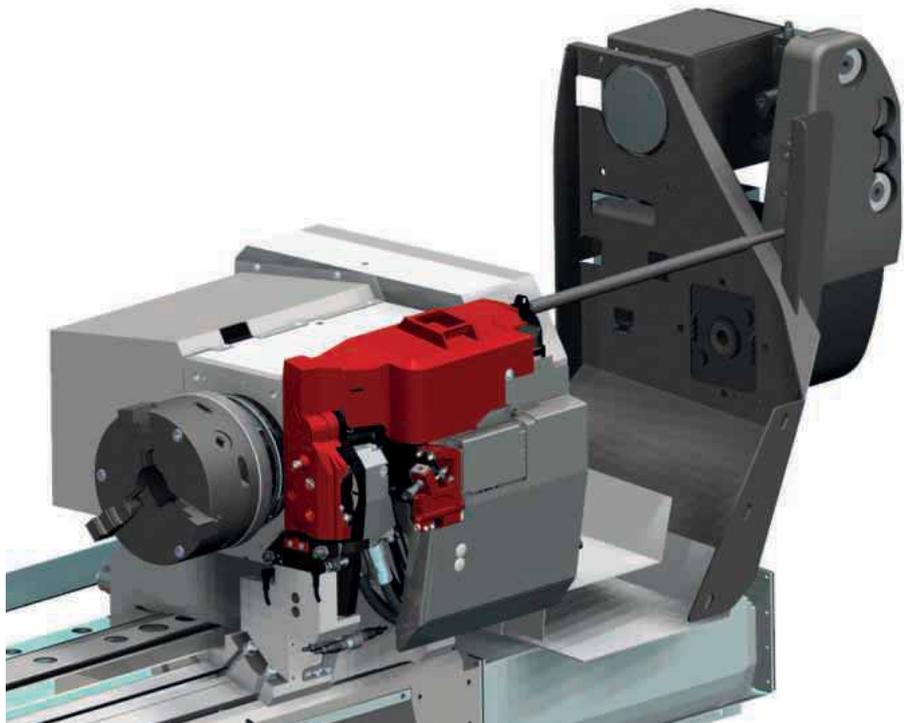
STUDER's WireDress® creates entirely new possibilities for grinding with metal-bonded CBN and diamond grinding wheels. Not only does this cutting-edge EDM technology save massive downtime, it also makes it possible to dress sintered metal bonds with the highest precision in the grinding machine at the full working speed.



But how does this dressing technology work? Michael Klotz, project manager for development at Fritz Studer AG, explains: "It is a well-known fact that metal-bonded grinding wheels are much more durable and dimensionally stable when machining difficult-to-machine materials and ultimately enable higher productivity. The problem with this is that metal bonds can only be dressed to a very limited extent using conventional methods in the grinding machine. In addition to this there is a high dressing tool wear associated with a low cutting ability. This is neither an operator-friendly, nor a high quality and process consistent dressing method".

That's why the "best" bond, the metal bond, is rarely used. "STUDER has developed, along with technology partners, the machine-integrated WireDress dressing technology. Here, the dressing is done at full wheel speed. In contrast to conventional mechanical or external EDM dressing, WireDress dressing occurs by a modified wire erosion in the grinding machine, where the grinding oil serves as a dielectric.

The dressing process is contactless and wear-free. The grit itself is not dressed, the metallic bond around the grit is removed. Depending on how deep the grit is embedded in the bond, it either falls out or remains with original sharpness in the bond.



The grinding wheel receives a high grain clearance for maximum cutting capability, lower grinding forces and low burning risk.

You can now harness the capabilities of metal bond with WireDress. Using a bond with a high dimensional stability, almost any profile can be precision-contoured in the μm range. Long dressing intervals can be achieved. Yet another plus: the accurate processing of sophisticated or smallest geometries that was neither economical nor possible before, now becomes feasible. Compared to grinding with ceramic-bonded grinding tools, significant increases in productivity in the range of at least 30 percent is realistic, with resin bonds, even more is possible. With a sintered metal bonded grinding wheel, you can even go beyond the limit - you can just re-dress it in the machine again. With a conventional with galvanic bonded grinding wheel you can only go over the limit once. Maximising these limits without fear also makes greater profitability possible," adds Michael Klotz.

WireDress previously had a drawback, in that the device took up a lot of space on the table and limited the usable centre length in the machine. With the new generation, WireDress is now much more compact and sits directly behind the workhead, making it more flexible and also more powerful than its predecessor.

Now the full centre distance can be used, as there is no restriction from the dressing device, which is now placed behind the workhead.

The new generation WireDress is also 20 percent faster than its predecessor, with a right and left dresser in one, that can be automatically swivelled to two positions.

By swivelling the dresser, higher shoulders and deeper profiles can now be dressed with a universal dressing tool - the wire. Large grain sizes up to B151 (D151) can now be dressed for maximum cutting performance, depending on the bond. It also has an extended sensory monitoring capability

Thanks to WireDress, the dressing of metal-bonded grinding wheels is now a breeze. STUDER is convinced that this allows users to massively increase productivity and precision when grinding carbide, steel and ceramics.

Fritz Studer Award 2017

STUDER has awarded its research prize, the "Fritz Studer Award", for the fifth time. Applicants from several European countries submitted their work and the winner of the



Dr.-Ing. André Wagner, winner of the Fritz Studer Award 2017

prize was announced at the STUDER Motion Meeting in Thun.

The Fritz Studer Award is aimed at graduates of European universities and technical colleges. Creative ideas and solutions are targeted at the machine tool industry.

"The goal behind the research award is, on the one hand feasible solutions and ideas which strengthen the innovative power of the machine tool industry and, on the other, our desire to use this award to promote young scientists and technicians," states, Dr.-Ing. Frank Fiebelkorn head of Product Development, Research and Technology Fritz Studer AG.

The work sent in for this award were to specifically focus on the following topics: Innovative machine concepts or components for machine tools for precision machining; alternative materials in mechanical engineering; simulation models for the dynamic and thermal behaviour of machine tools; control and sensor concepts for machine tools; new or advanced manufacturing techniques, especially in hard fine machining, such as grinding, hard turning, etc.

Several studies, master theses and dissertations were received by STUDER and evaluated by an expert jury. The jury consisted of the Prof. Dr Konrad Wegener, Institute for Machine Tools and Production at the ETH Zurich, Dr.-Ing. Hans-Werner Hoffmeister, head of Production Engineering at the Institute of Machine Tools and Production Technology of the TU Braunschweig and Dr.-Ing. Frank Fiebelkorn, head of Product Development, Research and Technology at Fritz Studer AG.

But how were the various entries evaluated?

"Criteria were, for example, the feasibility to implement the idea in the machine tool industry, the innovation and quality of the idea, the scientific content and form, as well as the correctness of the statements and results", explains Prof. Dr.-Ing. Konrad Wegener.

"Many of the works received were of very high quality, the ideas very good and of high innovative strength," confirms Dr.-Ing. Hans-Werner Hoffmeister. The decision was therefore not an easy one to make.

The winner was Dr.-Ing. André Wagner from the Leibniz Institute for Materials-Oriented Technologies - IWT Bremen. He convinced the jury with the topic 'Fine grinding of gears with elastic grinding wheels'.

His work deals with the grinding of gears with elastic grinding wheels. This process improves surface finish during the finishing process, has a very low risk of thermal damage and, moreover, does not require any additional finishing process down the line.

"I did not expect this decision. I am delighted that my work has been honoured to this extent", says Dr.-Ing. André Wagner. He was unable to accept the award in person as his wife was about to give birth. The Fritz Studer Award and the cheque for 10,000 CHF was presented to Dr.-Ing. Frank Fiebelkorn on his behalf.

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A wealth of innovation and a world premiere

The UNITED GRINDING Group is the world's largest supplier of precision grinding machines in terms of revenue. It includes the eight corporate brands: BLOHM; EWAG; JUNG; MÄGERLE; MIKROSA; SCHAUDT; STUDER; WALTER.

"Within UNITED GRINDING, we have the broadest application knowledge and product portfolio and we offer a comprehensive array of services," says Stephan Nell, CEO of the UNITED GRINDING Group AG. "We have more than 2,300 employees in branches all over the world ensuring that we are a competent and readily available local partner for our customers."

The innovative technologies of the companies in the UNITED GRINDING Group are used in a wide variety of industries. Key areas are the automotive and supplier industry, medical, aerospace industry, tooling, die and mould, transportation and heavy industry, machine manufacturers, energy and precision mechanics. The largest sales markets include Western Europe, Asia, North and South America.

It was therefore unsurprising that the UNITED GRINDING stand was by far the busiest at GrindTec:

New favorit 1600 for long workpieces

The new universal machine, the favorit 1600 has a centre distance of 1,600 mm (63 inches) with the capability to handle long workpieces.

Other features include: height of centres; 175 mm; maximum workpiece weight between centres 150 kg; cross slide (x-axis) maximum travel 370 mm; longitudinal slide (x-axis) maximum travel 1,750 mm.

This CNC universal cylindrical grinding machine is designed for grinding both single part and series production and can be fitted with automation. With various options such as measuring control, balancing system, contact detection and longitudinal positioning, it can be subsequently adapted to other grinding tasks.

The favorit is a very reasonably priced machine. As with all STUDER cylindrical grinding machines, the proven machine bed made of solid Granitan® ensures maximum precision, performance and safety.

The full enclosure provides an optimal view of the grinding process. The wheelhead, which can be automatically

positioned every 3°, can accommodate a belt-driven external and internal grinding spindle.

Thanks to the practice-oriented STUDER grinding software, with its proven Studer-pictogramming, even less experienced users can program grinding and dressing cycles quickly and efficiently. With the optionally available StuderGRIND software, special applications, such as profiling the grinding wheel for complex workpiece shapes, can be efficiently programmed. Development, production, assembly and testing of the STUDER products are process-oriented and comply with the strict guidelines of VDA 6.4 and ISO 9001.

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The new favorit 1600 from STUDER

New from the ground up: the HELITRONIC POWER 400 and HELITRONIC POWER DIAMOND 400 from WALTER

WALTER unveiled two brand new HELITRONIC models at this year's GrindTec: the HELITRONIC POWER 400 grinding machine and the HELITRONIC POWER DIAMOND 400 grinding and eroding machine. WALTER's latest machines feature a grinding wheel / electrode changer and extended traverse, and can now machine tools up to 380 mm in length, surpassing the previous limit of 280 mm, representing an increase of over 35 percent.

However, the two machines offer more than just longer workpiece lengths. WALTER engineers completely redesigned the HELITRONIC POWER and HELITRONIC POWER DIAMOND multi-functional machines.

"The new HELITRONIC POWER 400 and HELITRONIC POWER DIAMOND 400 machines are more in line with our HELITRONIC VISION models. They're basically two completely new machines",



The HELITRONIC POWER 400 grinding machine and HELITRONIC POWER DIAMOND 400 "two-in-one" eroding and grinding machine



says Torsten Wörner, product manager in the grinding department at WALTER.

For example, the base of both machines was completely remodelled. The new, more rigid machine bed ensures even better damping behaviour which in turn facilitates greater precision and higher surface quality. The C-axis of the standard version of both new machines is driven by a worm drive. A low-maintenance and extremely accurate torque motor is also available as an optional feature.

The engineers also used the pneumatically driven steady rests and tailstocks from the HELITRONIC VISION series. This means that the steady rests and tailstocks are less prone to leaks, require less maintenance and are much cleaner. They also absorb less heat than components that use hydraulic oil, thus ensuring even greater precision.

Like all "Two-in-one" machines from WALTER, the new HELITRONIC POWER DIAMOND 400 also uses Fine Pulse Technology. "For over a year, this technology has been at the forefront when it comes to surface quality, cutting edge roughness and process stability of PCD tools," says Siegfried Hegele, product

manager in the eroding department at WALTER.

Unlike the previous models, the HELITRONIC POWER DIAMOND 400 and HELITRONIC POWER 400 machines can be automated with a top loader for up to 500 tools, a robot loader for up to 7,500 tools or the robot loader 25, which has a carrying capacity of 25 kg including grippers, was previously only available as an option for HELITRONIC VISION machines.

Both machines use the HELITRONIC TOOL STUDIO grinding and eroding software.

WALTER EWAG UK Ltd

Tel: 01926 485047

Email: neil.whittingham@walter-machines.de

www.walter-machines.com

Exceptionally high performance for surface and profile grinding

The PLANOMAT HP 412 from BLOHM, presented at GrindTec 2018, is a powerful and impressive grinding machine with high efficiency. It shows its strengths even under the most demanding conditions and continually delivers optimal results. With more than 1,000 machines delivered in 34 countries, every aspect of the PLANOMAT HP is consistently geared towards productivity and performance. The machine can be flexibly and individually optimized for all requirements.

The sound design concept of the PLANOMAT HP offers fast infeed speeds and accelerations as well as grinding drives of up to 24.5 kW. Attractive options such as a measuring probe, separate vertical grinding spindle or a fourth axis allow the machine to be individually expanded for maximum flexibility.

BLOHM's most successful machine series, the PLANOMAT HP has been consistently fulfilling customer requirements for decades, whether used as a universal machine for individual and small batch production or as a cost-effective, customised production machine in all areas of industry. The focus is clearly on one goal: customer productivity.

The BLOHM operator interface enables quick and easy operation and can be individually adapted to the respective task, whether simple workshop programming, die and mold or production applications. This ensures optimal utilisation of the machine's capacity and increases productivity in the long term.



Proven technology for quality and precision



BLOHM also offers the PLANOMAT HP in combination with automated loading concepts with conventional or collaborative robots. The goal is clear: with the unmanned loading and unloading concept, customers can reduce their auxiliary times and further increase output. Process reliability is also increased by the higher degree of automation. Reject rates and downtimes are significantly reduced.

The technical highlights of the JUNG J600, presented at GrindTec 2018, have convinced customers throughout the world: exact reproducibility of grinding results, superb surfaces in mirror-finish quality and individual adaptation of the machine to the customers' requirements.

The J600 is a CNC machine based on the familiar JUNG operator interface. The precise mechanical design of the machine guarantees consistently first-class grinding results. The J600 demonstrates its precision and flexibility in daily use, particularly when grinding demanding applications in the die and mould sector.

With a grinding range of 300 x 600 mm, high flexibility and optimal results in individual component and small batch production, the J600 enables customers to

optimally machine their products and applications. JUNG's main goal of making its customers successful is thus particularly supported by the J600.

The J600 boasts the following hardware components: proven cross-slide design comprising gray cast iron, additional electronic hand wheel in the area of the work area door as an option for the X- and Z-axis, and two doors to the work area.

The design principle is oriented towards a modular system, so that the J600 can be optimally tailored to individual customer requirements. The J600 owes its outstanding damping characteristics not least to the EasySlide hydrodynamic guideways in the table axis. High-precision ball-type linear drives ensure high accelerations and infeed speeds.

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Junker presents innovative grinding technologies at GrindTec

Economical grinding of cam pieces

The Jucam 1S from Junker is a specialist in the ultra-precise, efficient grinding of cam pieces. With its leading-edge technology and minimal downtimes, this machine enables economical production. This and further grinding technology innovations was presented by Junker at GrindTec.

At the core of the Jucam is a double workhead with two clamping fixtures that can be swivelled 180 degrees to a precisely defined end position. The workpiece, currently in the loading position, is transported to the grinding position using a fully automated process. At the same time, the second workpiece transitions from the grinding to the discharge position, reducing downtimes to a minimum.

The Jucam 1S enables automotive manufacturers and suppliers to achieve extremely economical cam piece grinding. The Junker non-cylindrical grinding machine is also a specialist in the efficient package grinding of single cams.

When grinding cam pieces, the precise angular reference to the inner gear is essential. Therefore, the Jucam 1S clamps the cam pieces with an inner clamping arbor. The high-quality standards demanded by the automotive industry are fully met by the "cam piece specialist" with its intelligent control system. This compensates automatically for material deviations or disturbance variables such as temperature fluctuations, guaranteeing that all components are conforming to a constant standard.

For maximum repeatability, a long service life and high stock removal performance coupled with a consistently high standard of

quality, CBN in a range of specifications is used as an abrasive. Depending on the application, the grinding wheels contain a carbon base body: it is light-weight, has vibration-damping properties and remains dimensionally stable even at high speeds.

With the Jucam 1S, Junker is offering far more than just a grinding machine. The company's performance promise includes delivery and installation of the machine as well as a grinding process designed according to the customer's wishes and production requirements. Thus, the Junker Jucam 1S is combining the non-cylindrical grinding of cams with the cylindrical grinding of bearings.

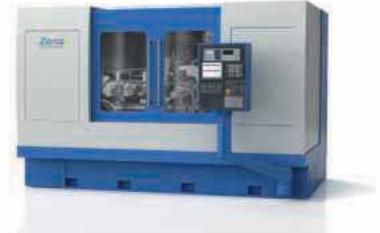
Numerika: Fast product change for flexible series production

The name Numerika stands for flexibility in production as well. The corundum grinding machine specialises in the series production of various workpieces. The CNC control, can accept several types of one workpiece family. This allows the fast change of the production, from one workpiece to another. For the smooth production process, the Numerika can be designed with an automatic loading and unloading system. This robust corundum grinding machine for conventional grinding is an ideal addition to the Junker CBN high speed grinding machines. For example, the Numerika is grinding flanges and pins on crankshafts as well as transmission, turbo loader and drive shafts precisely and reliably.

partner4JU: Intelligent machines for intelligent production

Always a step ahead of the trend, for over 10 years the grinding expert has been focusing consequently on the digitalisation of the machines, which has been the prerequisite for Industry 4.0. Extensive data acquisition and evaluation of machine and process data have been state-of-the-art at Junker for a long time. In this way, the machines and equipment are prepared for worldwide networking and communication.

The partner4JU digitalisation program describes the next step in this development: Junker is adapting the digitalisation of the machines exactly to customer requirements. The base for this consequent further



development is the reference architecture model Industry 4.0 (RAM 4.0), which allows for individual integration of machines and equipment in all areas of the organisation. partner4JU ensures the comprehensive quality improvement and production flexibility.



Junker technology partner: individual solutions for high expectations

Junker is always looking for and finding individual solutions for special tasks for its customers. This is only possible with the extensive know-how and experience of its experts. For more than 50 years Junker has been influencing grinding technology with high precision equipment and innovative technologies. Behind each machine is a specifically adapted concept allowing the customer to increase and improve production.

Junker plans the entire production process, from profiling to coating of the grinding wheels to individual machine setup. Junker also has its own technology centre, where the grinding experts test the production process. Time consuming and therefore expensive test runs at the customers' premises are reduced or eliminated altogether.

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Upturn fuels further investment

UK precision diamond grinding tool manufacturer, Cranden Diamond Products Ltd chose this year's GRINDTEC exhibition in Augsburg, Germany and the MACH 2018 exhibition in Birmingham to announce the acquisition of its 3rd Wasino CNC Optical Profile Grinder from Amada Germany.

The Amada GLS 150GL OPG can "see" 0.5 micron and is used by a select few precision tool manufacturers worldwide. They're not cheap and the fact that Cranden already has two and is investing in a third machine is a statement of how successful Cranden has been in capturing an increasing percentage of the aerospace market for supplying diamond and CBN grinding tooling in the UK and abroad.

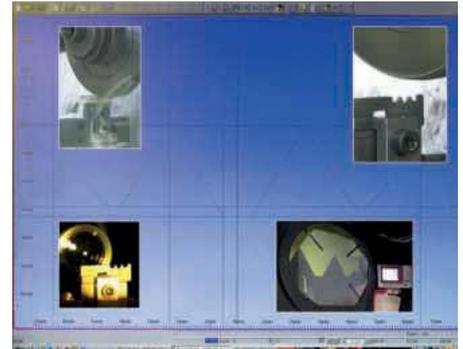
Stuart Clearly, of Cranden Diamond Products Ltd, says: "We had our first Amada (Wasino) OPG delivered in 2008, just as the sub-prime stockmarket crash happened and it was a real gamble at a time when order books froze for everyone and we were staring into the unknown." Cranden started pitching for extremely tight tolerance aerospace business that had been denied them before and this grew. Working to such tight specifications became the standard from then on and it has been updating our CNC and technological design/QC capabilities since then to match the quality that an Amada gives as standard.

"The second Amada OPG was brought in four years ago to help consolidate our position in the marketplace. The third Amada OPG is needed because Cranden is busier because of UK manufacturing's successes and the huge up-turn in demand for UK precision engineering from abroad since the Brexit vote."

Cranden Diamond Products Ltd was incorporated in the 80's and currently employs 45 key engineers and laboratory chemists. It also supplies the defence, automotive, oil & gas, gear and medical industries but considers aerospace its true home.

The Amada GLS-150GL – Optical Profile Grinder is a full CNC grinder and has manual and automatic features as well. One of the most useful features for Cranden Diamond is the manual intervention through the large high-resolution projector screen, making it possible to optically see the part before and after grinding.

Using the special 'teach-in and play back'



function and comparing the actual result to the required geometry on the screen with magnification of up to 100 means, 1µm and better is achieved. By teaching the profile through a few simple steps, it interacts with the control and writes the program of the ultra-precision forms, allowing full operator control from manual, automatic to full CNC. When grinding hard materials, it is inevitable for the wheel to wear but not necessarily evenly. This is where the 'teach-in play back' comes into its own: the operator repeats the simple teach-in system on the screen and, because the actual wheel form (worn wheel) is used, it automatically compensates for the wheel wear and grinds a perfect part from an in-perfect wheel.

The 3rd machine has the added advantage of the automatic swivelling of the grinding head, compared to the manual swivel previously available. Whereas previously the operator would set the machine to grind one side of a profile using a LH or RH wheel and then change the wheel, reset the swivel of the grinding head and grind the opposite side of the profile, the new machine has the ability to grind a full form using the auto swivel function of the wheelhead in one setup. As the machines are used out of hours unmanned, this will increase the through-put considerably.

The Amada GLS OPG has a table size of 400 x 250 mm, with travels of 300 mm and 150 mm. The wheelhead has a vertical traverse of up to 155 mm, a traverse feed of 200 mm and cross of 150 mm. The head also

swivels for relief angles radially, axially and the whole head slide swivels (now automatic). Grinding wheels up to 180 mm diameter are used with wheel speed up to 6,000 rpm (20,000 option). Such a precise machine with so many features requires exceptional rigidity to ensure the large screen is perfectly stable and the finished part features are met. This is achieved through innovation in design in machine castings, slides and all moving parts. As with all machines, Amada use FANUC controls.

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Saint-Gobain Abrasives showcases latest grinding tool innovations

Saint-Gobain Abrasives, the world-leading manufacturer and supplier of performance abrasives, presented its latest grinding tool innovations from its Norton and Norton Winter brands at this year's GrindTec. The highlights at the show included products designed for the grinding of engine and gearbox components and the manufacture of components for the aerospace industry.

The company also demonstrated the advantages of its high porosity abrasives and presented a selection of products specifically designed for a variety of applications from grinding and dressing to finishing and polishing across six key markets: Tools, Gears, Aerospace, Bearing, Automotive and General Engineering. With a full range of products, Saint-Gobain Abrasives supports these industries with the latest technology to reduce costs while delivering improved performance.

A highlight of the Saint-Gobain Abrasives stand was Norton Winter AEON technology, the latest innovation in electroplated grinding wheels designed for high precision applications in the automotive market. AEON superabrasive wheels have one usable abrasive layer to which diamond or CBN grit particles are mechanically fixed by an electrochemical process to achieve high grit retention levels for extended wheel life. Once the wheels are worn, the core can be re-plated with new CBN or Diamond grain in a continuous cycle, allowing it to be reused several times for significant cost savings. Norton Winter grinding tools manufactured with this process can now grind gearbox and engine components with greater speed and precision for increased productivity.

Also on display was the Norton Winter CarbonForce large dimension grinding wheel, which is made up of a carbon fibre

reinforced polymer core to offer greater strength than steel at a lower weight than aluminium. Norton Winter CarbonForce achieves a 75 percent reduction in weight compared to steel-hubbed superabrasive wheels for greater operator safety. With their robust, form-holding carbon fibre core, the wheels also come in a multi-track version to machine multiple large engine components at once, grinding at high speeds and low pressures. Norton Winter CarbonForce also reduces cycle times thanks to fewer wheel changeovers, lowering production costs.

Cool grinding in hot zones

Norton Quantum X grinding wheels combine three of the very best Norton technologies, Quantum, Vortex2 & Vitrium3, to bring high value and performance to a range of industries. This highly porous wheel delivers high material removal, exceptional cool grinding and reduced cycle times and has been specially designed to efficiently grind difficult to machine materials in heat and stress sensitive processes, such as the aerospace industry.

Norton Vitrium3 was on the stand as part of the Tools and General Engineering showcase. Vitrium3 features exclusive chemistry that promotes grain adhesion and allows for increased porosity. An improved holding power and reduced bond-to-abrasive ratio exposes a larger grain surface area, enabling the wheel to cut more freely to improve cut rate. This reduced bond-part interaction also minimises heat build-up to reduce burn and power consumption and requires lower grinding forces on the part to improve quality. Thanks to the superior grain holding properties, wheel form and corner holding is optimised to reduce dressing time, dresser wear and dresser replacement requirements. The bond also provides the ultimate wheel strength with lighter construction, so machines can work at higher feedrates, speeds and pressures, significantly increasing production with existing equipment.

Visitors were also informed how effective cooling is also achieved with the porous Norton Winter Paradigm bond. Thanks to



decreased bond-to-workpiece action, the technology reduces friction and heat generation to improve part quality. Combining the wear resistance of a metal bonded wheel together with the ease of profiling a vitrified bonded wheel, Norton Paradigm provides the ultimate precision grinding tool for maximum productivity with long life, reducing downtime and providing a more cost-effective solution to manufacturers.

Optimised gear-grinding

Norton Abrasives has introduced a new platform for engineered gear solutions, Norton Xtrium. This new platform removes various sub-brands to streamline the product portfolio and offers a single, simplified solution to customers. The range has also been expanded with the addition of a new dual-worm grinding product, further enhancing Norton's capabilities in the gear grinding market.



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PRECISION SURFACING SOLUTIONS announces latest acquisition



PRECISION SURFACING SOLUTIONS, formerly Lapmaster Wolters Group, a leading supplier of equipment and services for precision lapping, polishing, grinding, and honing, has announced it has acquired REFORM Grinding Technology GmbH, a provider of machine tools and systems for high-precision grinding applications.

Brian Nelson, president and CEO of PRECISION SURFACING SOLUTIONS, says: "The acquisition of the REFORM brand significantly increases our precision grinding system portfolio and will provide the ability to offer complementary grinding technologies to our existing global customer base. This acquisition will expand our global team to over 900 employees and will further strengthen our ability to offer technology to a wider range of applications, particularly in combination with our existing ELB, MICRON, and aba profile grinding brands."

Kelly Cavitt, chief operating officer of PRECISION SURFACING SOLUTIONS, adds: "The addition of REFORM in Fulda widens our base of operations in Germany and offers significant operational and cost synergies when combined with our existing operations in Rendsburg, Aschaffenburg, and Babenhausen. I look forward to having the REFORM team join our group and know

that the leadership of Matthias Mantel and Michael Jahnke will guide a successful path for the REFORM product line."

Brett Rosenthal, PSS group chief technical officer, says: "This combination of technologies and technical resources will enable us to drive market leading grinding solutions for our customers, particularly those in the aerospace industry."

PRECISION SURFACING SOLUTIONS has solved the most challenging precision surfacing problems. With hundreds of years of experience within each of its brands, PSS has a proven history of successfully developing cost-effective processing solutions for virtually any application.

PRECISION SURFACING SOLUTIONS is a leader in the development of technology to produce micron accuracy surface finishes. Under the well-recognised Lapmaster, Peter Wolters, ELB, MICRON, aba, REFORM and Barnes brands, the company has a proven history of successfully developing cost-effective processing solutions for the lapping, polishing, fine grinding, brush deburring, creep feed grinding, bore honing, double disc grinding, and buffing through an expanding network of sales and services offices located throughout the world. The company's 110,000+ installed systems, across 5,000+ active customers,

utilise precision abrasive finishing technology for various end-user precision finishing applications. It is headquartered in Mt. Prospect, IL, employing over 900 people across eleven manufacturing facilities on three continents.

The company supports manufacturers in a wide variety of industries in which precision grinding, lapping, polishing, deburring and advanced materials processing equipment is commonly used. They all need high-quality, high-precision, stable and well-engineered machines to manufacture high-quality workpieces.

REFORM is a leading designer and builder of high-precision grinding machine tools and systems and specialises in travelling head grinders, rotary table grinders, profile grinders, AERO grinders for specific aerospace applications and custom systems. The company was founded in 1904 in Libina, Czech Republic. Since 1987, the company has been headquartered in Fulda, Germany.

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GER CNC HIGH PRECISION CYLINDRICAL & UNIVERSAL GRINDERS

- Range of 20 different models available
- Size range from 300 mm to 6,000 mm between centres
- Component diameter of between 200 mm and 1,000 mm
- Maximum component weight 100 Kgs up to 8,000 Kgs

GER CNC HIGH PRECISION PLANE & PROFILE SURFACE GRINDERS

- Range of 74 different models available
- Component sizes ranging from 400 mm x 200 mm up to 6,000 mm x 1,000 mm



GER CNC HIGH PRECISION ROTARY TABLE SURFACE GRINDERS

ROTARY TABLE VERTICAL GRINDERS

ROTARY TABLE UNIVERSAL GRINDING CENTRES

- Range of 23 models available
- Table diameters from 600 mm to 2,500 mm



Agent for GER range in UK and Ireland

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STUDER 'leverages' quality grinding

Based in Sutton-in-Ashfield, Notts, R&D Leverage provides expert technical solutions to the European plastic packaging industry. The busy company serves a wide range of demanding industries including the food and beverage, medical, cosmetics, household and personal care markets.

The work of R&D Leverage UK, together with that of R&D Leverage USA, has enabled the business to develop into one of the foremost providers of quality tooling for the world's packaging industries. R&D Leverage's UK plant produces one stage, injection stretch blow mould (ISBM) tooling for PET containers.

Certified to BS EN ISO 9001:2000, R&D Leverage UK is equipped with a wide range of innovative design, production and inspection aids that help ensure the delivery of on-time, on-budget, premium quality moulds. It recently installed a second STUDER S31 cylindrical grinder purchased from UK STUDER agent Micronz.

Having been delighted with the performance of the company's first STUDER S31, ever increasing demand for the company's moulds recently prompted the purchase of the second machine from the famous Swiss manufacturer.

Alan Tolley, managing director of R&D Leverage UK, says: "Following its installation, the ease-of-use of our first STUDER grinder meant that it was soon turning-out the promised volumes of ground components with excellent

dimensional and surface finish characteristics. Since this time, the grinder has maintained its impressive performance and has proven to be extremely reliable.

"When demand for ground parts recently further increased, we were able to work closely once again with Mark Maurice, the owner of Micronz, to specify a STUDER S31 grinder that matched our evolving needs. Now fully operational, our new STUDER S31 cylindrical grinder is now producing the expected high volumes of premium quality ground components and it has removed the potential for bottle-necks in our grinding department."

The compact STUDER S31 CNC universal cylindrical grinding machine is designed for the grinding of medium-sized workpieces with external and internal grinding in a single clamping. The versatile S31 can to grind workpieces in customised as well as small and large-batch production runs. The S31 can be adapted precisely to the demands placed on it; this flexibility guarantees an optimal price/performance ratio.

With the ability to machine workpieces with a maximum weight of 80/120 kg, STUDER's S31 has distances between centres of 650/1,000 mm, a centre height of 175 mm and has a grinding wheel diameter of 500 mm.

The machine's solid Granitan base forms the basis of a cylindrical grinding machine that is equipped with high-quality components, guaranteeing maximum precision, performance and reliability over many years. The material structure developed by STUDER, that has proven its efficiency over many years, is produced in the company's own plant using the most modern industrial techniques. The excellent cushioning behaviour of the S31's machine base ensures outstanding surface quality of the ground workpieces and an increased service life of grinding wheels, further reducing downtime.

The S31's full enclosure allows the use of emulsions or oils as cooling lubricants, whilst two large sliding doors provide users with easy access. For highly-efficient automated,



24-hour running, handling devices can be connected via the machine's defined loader interface.

The S31's longitudinal and cross slides V and flat guideways have a non-abrasive Granitan S200 slideway coating and are moulded directly into the machine base. The guideways offer the highest possible accuracy throughout the machine's entire speed range with high load capacity and excellent cushioning levels.

The swivelling wheelhead enables the external, internal and form grinding of workpieces in a single clamping. The wheelhead is equipped with a water-cooled, maintenance-free motor-spindle mounted on roller bearings, with infinitely variable speed control. External grinding wheels with a diameter of 500 mm, 20", and a width of 63, 80 F5, mm, 2.5"/3.15", are fitted to the shaft ends. Efficient high-frequency spindles with an external diameter of 120 mm, 4.72", are used for internal grinding.

The S31 also features a frequency-controlled motor-driven grinding spindle for external and internal grinding, whilst the machine's C-axis workhead enables efficient and accurate form and thread grinding.

The use of STUDER's practical grinding software with its proven pictogramming allows less experienced users to quickly optimise the full potential of the S31. StuderGRIND software is also available, enabling efficient programming of special applications, such as form and thread grinding.

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Largest ever GER CNC plane and profile surface grinder

International Manufacturing Solutions Ltd (IMSL), the UK agent for GER, has announced the launch of the GER SR 400-100, high-precision CNC plane and profile surface grinding machine. Although the advanced new grinder is currently the largest capacity profile surface grinding machine made available by GER, if required, the well-known company is able to produce machines with capacities of up to six metres.

The impressive new 4,000 x 1,000 mm capacity, heavy-duty machine is a product of GER's 60 plus years of in-depth experience and of the company's renowned expertise in the design and manufacture of high precision CNC grinders. As one of Europe's leading grinding machine manufacturers, examples of GER's celebrated CNC machines can be found throughout the world. The company's innovative products are used by a wide range of demanding sectors, including the global aerospace, automotive, bearing and gear manufacturing industries. GER CNC grinders are also used by many discerning general engineering businesses.

GER's comprehensive understanding of grinding applications and its deep appreciation of customers' needs has allowed the company to develop an all-embracing range of more than one hundred, internal, surface, profile and cylindrical grinders, in addition to universal vertical grinding centres and rotary table plane surface grinders. With this impressive range of standard machines as a basis, GER is able to tailor machines to satisfy the specific needs of individual customers' production requirements.

This was the case with the company's exciting new SR 400-100, high precision CNC plane and profile surface grinding machine. The imposing new machine was developed for a leading Austrian company for the precision grinding of 4 m x 1 m press-tools. Due to the sheer size and complex shape of the customer's press-tools, the machine was equipped with a 500 mm diameter x 100 mm wide wheel head incorporating a 30 kW spindle motor and three independent rotary diamond dresser units. To help satisfy the customer's demanding accuracy requirements all



slideways incorporate precision ball screws, FANUC drive motors and Heidenhain linear scale feedback.

The large capacity SR 400-100 CNC grinder has overall dimensions of 9.6 x 4.4 x 3.6 m. The machine has a maximum grinding length of 4,000 mm and a maximum grinding width, wheel included, of 1,100 mm. It has a vertical distance, table to wheel spindle centre, of 1,000 mm and a maximum component weight on table capability of 4,300 kg.

Manufactured to comply with the 2006/42/CE safety standard, the new machine was designed and developed using GER's well-proven methods, enabling it to deliver high-levels of accuracy, great strength, impressive levels of productivity and outstanding reliability. As with all GER machines, finite element analysis and the latest 3D CAD software were used in the machines design.

The "T" shaped configuration of the SR 400-100's bed guarantees an extremely rigid structure. High quality perlite cast iron is used for all of the machine's major castings. These castings are generously ribbed and feature a rigid box section construction that provides excellent damping and stability, characteristics needed for high precision grinding applications.

The machine's X-axis table guide ways are mounted directly on to the front section of the machine bed, enabling the table to accept much heavier loads whilst still achieving smooth movement at high speeds. The X-axis table guide ways, incorporated into the machine's bed, are designed to ensure the table is rigidly supported throughout its entire stroke. This robust design principle also applies to the machine's Z-axis main column guide ways.

All guideways are precisely ground, levelled and hand scraped to achieve the



highest geometrical accuracy. A similar painstaking process is followed for the corresponding guides which are Turcite coated. This coating, in combination with automatic lubrication, reduces the negative effects of slip-stick and also helps reduce slide wear.

The machine's wheel head has an extremely rigid structure, with the motor assembly mounted inside a heavy cast casing within the column structure. This heavy-duty assembly balances the generated masses and, as it is mounted at the rear of the guide ways, it limits the wheel head overhang to avoid deflexions under demanding grinding conditions.

The SR 400-100 CNC wheel spindle motor drives the grinding spindle directly via a flexible coupling. The cartridge wheel spindle arrangement has three pairs of sealed precision angular contact bearings mounted on a nitride hardened and ground spindle to provide the rigid support required for high accuracy grinding.

In addition to GER grinders' reputation for build-quality, great strength and longevity, a major company's advantage is GER's powerful software that operates on the front end of the FANUC control. GER's

all-embracing, yet easy-to-use software enables the most complex of profiles and cycles to be very simply and quickly programmed, even by a novice. Throughout the world, GER's ingenious software is regarded as being a major benefit when compared to other manufacturers' software offerings. As GER's unique software was created in-house, company staff are able to tailor it to customer's exact needs.

The SR 400-100 CNC's uses FANUC's powerful Oi-TD CNC control that incorporates Windows XP operating system and simple, user-friendly interactive conversational programming with graphical images and grinding cycles to guide the operator. Data input is via a 15" LCD colour touch screen or by an alphanumeric keyboard. Infinite programs and cycles can be programmed and stored. The SR 400-100 CNC also provides automatic wheel diameter and speed compensation and last but not least, simulation of dressing and grinding profiles with contour following is included.

International Manufacturing Solutions Ltd (IMSL) is the sole distributor of the GER range of high-precision CNC grinding machines in the UK and Ireland. IMSL



provides a complete range of GER grinding solutions to all aspects of high precision CNC grinding, from cost-effective entry level grinders, to machines that are able to satisfy the most demanding of grinding applications. In situations where standard GER machines are unable to satisfy customers' challenging, non-standard needs, IMSL has extensive experience in providing bespoke, turnkey solutions.

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Installation of first Micromatic grinding machine

Master Abrasives has sold and installed its first Micromatic grinding machine in the UK, the ECO-200 high accuracy universal grinder, at Coventry-based Earlsdon Technology Ltd.

Since being made the sole UK distributor for Micromatic Grinding Technologies, Master Abrasives has been visited by numerous UK engineering companies at its showroom based in Daventry to see a demonstration of the ECO-200 grinding machine. This included Earlsdon Technology Ltd, based in Coventry, a company that has been designing and building special-purpose machine tools and allied automation since 1993. They specialise in machines for manufacturers of engine valves and producers of fasteners for aerospace, automotive and industrial applications.

Brian Little, toolroom supervisor at Earlsdon, recognised the importance of choosing a cost-effective machine, with the necessary precision, that is versatile enough to meet the company's wide-ranging requirements.

Brian Little says: "This machine was



purchased on the basis that it will, in the long term, provide cost savings in producing customised tooling for customers' specific bespoke requirements and will reduce the risk of causing delays in machine manufacture and approval. Currently we send this work out to subcontract and cannot rely on a speedy reaction time or the geometrical accuracy required. The ECO-200 will provide an in-house service which can be easily controlled to suit the demands and timeframe of our own machine production and meet the accuracies required."

Earlsdon's new machine has a 400 mm

grinding capacity between centres and an additional internal grinding spindle. The wheel head nitride hardened steel spindle runs in high precision multipoint hydrodynamic bearings which gives very high rigidity and excellent damping.

Martin Stevens, applications engineer for Master Abrasives, says: "We encourage those who are interested to get in touch and arrange a visit to our grinding and finishing showroom. We can show you Micromatic grinding machines' capabilities in action as well as other items we offer including our demonstration tape finisher, measuring equipment and abrasives."

Master Abrasives continues to offer its customer base a complete solution to their grinding and polishing requirements.

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Top customer honours Hermes as a premium supplier

For the first time in its many years of corporate history, C. & E. Fein GmbH honoured selected premium suppliers on 18 October with an award. Hermes Schleifmittel GmbH was also recognised for its extraordinary achievements in the context of the 150th anniversary of the company.

Due to many years of intensive and very successful business relationships, the internationally established C. & E. Fein GmbH is one of Hermes' top customers worldwide. The excellent communication and the partnership-based approach characterise the trusting cooperation between the two companies.

Since 2001, the traditional Hamburg-based company has been supplying the Swabian power tool manufacturer FEIN with accessories in the form of flexible abrasives on a base. Amongst other things, Hermes exclusively produces the "FEIN Triangle", which is used for the powerful MultiMaster system of the professional manufacturer.

The final assembly of the Hermes products for FEIN takes place at the European Hermes sites in cooperation with social institutions, such as: B. the sheltered workshops of the Lebenshilfe in Austria. This makes it possible to build a bridge between high-tech production and lived inclusion.

Executive vice president Sven Jarckow and sales manager Germany, Sven Henigshmidt, acting on behalf of all Hermes employees, received the high-quality Supplier Award, a faithful replica of the first electric hand drill invented by FEIN in 1895, at the FEIN headquarters in Schwäbisch Gmünd-Bargau.

"Today, I am honouring a supplier who is considered a premium supplier in my field," said Vanja Sahin (strategic buyer, C. & E. Fein GmbH) introducing the official handover. In her further remarks, she especially praised Hermes' high reliability and special flexibility: "Whether it's increasing or decreasing the number of units or developing it again and again requires samples to test an idea or innovation, we can always rely on our contact persons at Hermes."

She is particularly impressed by how well-structured Hermes is in Hamburg and Austria is always set up: "I have the feeling that I could call day and night. No matter



what question I have, my counterpart always knows who, how, what and where. Such a collaboration is fun and hopefully it will always stay that way. "

Strong Hermes appearance at EMO 2017

Hermes celebrated a successful participation at EMO in Hannover as a full-service provider of flexible abrasives and precision abrasives. The company presented its broad product portfolio of flexible abrasives and precision grinding tools to international trade visitors at the world's leading trade fair for metalworking.

"Following the recent merger of Hermes Schleifkörper GmbH, Dresden with Hermes Schleifmittel GmbH, Hamburg, EMO in Hannover was an ideal opportunity to offer our customers and the pleasing number of new interested parties Hermes a one-stop-shop and a strong, standardised Hermes Deutschland company", says Dr Jan Cord Becker, CEO Hermes Schleifwerkzeuge.

Especially in the automotive sector, Hermes offers the right grinding tool for all work steps from one source for grinding processes in engine, body and body construction, be it high-performance CBN superabrasives for pre-sanding or FB 637 film abrasives for finishing main machining pass or crank bearings of crankshafts or camshafts.

Hermes has clearly and concisely assigned the appropriate Hermes Premium products to all applications in a new online automotive special tool at www.hermes-automotive.com, including the most important product information

A new Hermes solution for tooth flank machining is the Hermes combination

grinding worm, which combines two working steps in one tool. The final rough grinding with a microlite polyurethane polishing area follows the efficient rough grinding with the ceramic-bonded tool area with the Hermes VITRA high-performance bond. This saves setup costs and increases the efficiency of the grinding processes.

With the integration of RFID chips (Radio Frequency Identification) into the Hermes CBNi discs, Hermes is responding to the growing demand for "intelligent" grinding tools in the market. The wireless data transfer between chip and grinding machine automatically ensures optimal tool settings. An advantage that machine operators appreciate.



Another product highlight on the Hermes stand at EMO was the new product development CERAMIT CR 476 J, a new flexible high-performance abrasive belt with ceramic grain which, with its pronounced edge stability, is particularly suitable for robot grinding applications.

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Diamonds are forever

Diamonds are not only "a girl's best friend" but play an important role for wear protection and guarantee maximum precision and overall equipment efficiency (OEE) for machine tools in serial production, especially when referring to polycrystalline diamond (PCD) which is an almost indestructible "all-rounder" due to its hardness.

The decision to use polycrystalline diamonds, not only for the machining of non-ferrous metals but also for wear protection, goes back to the year 1973 and the world's first LACH DIAMANT made PCD tools for the turning of copper commutators.

The possibility of using them in serial production raised the question of how the commutator spindles running on prisms during turning could be adapted to the new challenges with regard to tool life and guide accuracy.

The solution for industrial use was found in the hardest thing of all – the diamond.

This know-how became the basis of a broad range of applications for wear protection of different components in machine tools, centreless cylindrical grinding machines, for example prisms, bearing shells, centre points, steady rest blocks, sliding blocks, work rest blades, punching knives, and many other applications.



Several Components with PCD Wear Protection

The complete diamond dressing programme

LACH DIAMANT presented at GrindTec a complete programme of diamond dressing tools and rolls for the precision dressing of all conventional dressing wheels.

Industrial diamonds, self-imported, with qualities matching specific demands, are set into the requested holders for machine mounting and delivered to customers with a service guarantee.

One-way diamond dressing tools such as the top-notch development »Dia-Fliese-perfect« or diamond multi-point dressers are other available alternatives.

A special highlight among dressing rolls is »drebojet-plus«, an alternative diamond roll for the path-controlled dressing/profiling of grinding wheels.

In addition, LACH DIAMANT offers expert service for resetting and regrinding of single-point dressing diamonds, polished profile diamonds and diamond chisels for Diaform devices in its own grinding department for natural diamonds.



The »drebojet-plus« profiling dressing roll in action

New: diamond and CBN profile grinding wheels

The technology of »contour-profiled«-profile grinding wheels is at the same time the comeback of metal binders for LACH diamond and CBN grinding wheels.

Synthetic resin bond grinding wheels need up to three processing steps during the deep grinding of carbides, high-alloyed and ceramic components. The new metal bond »contour-profiled« profile grinding wheel now accomplishes this in one single step.

Almost every profile type, concave or convex, is possible, even with the smallest tolerances of up to 0.005 mm.

Costs for abrasives and wheels could be reduced by a factor of eight as one single profiled »contour-profiled« grinding wheel is sufficient for all so-far necessary set of wheels. Tool life is now up to 25 times longer, for example for solid carbide thread inserts.

The »contour-profiled« wheels achieve up to 35 to 60 percent time savings through higher feed rates per workpiece.

Compared to other machining methods, the LACH DIAMANT technology guarantees an almost 100 percent restoration of the original profile. Profile deviations are also excluded during service.



Three in one: »contour-profiled« diamond and CBN profile grinding wheels, the new technology for drastic cost cuttings during serial production

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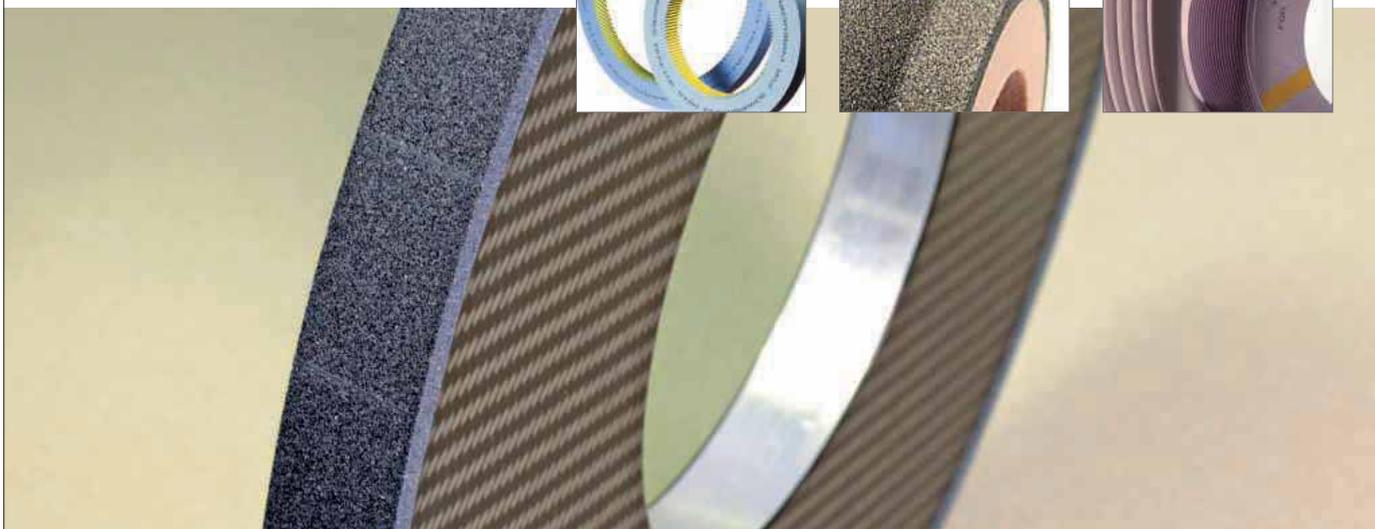
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Rebranded surface technology show extends international reach

SurfaceTechnology GERMANY 2018 5th to 7th June, Messe Stuttgart



Leveraging established strengths to create fresh opportunities: that's the formula for SurfaceTechnology GERMANY, the international trade fair for surface treatment solutions, as it heads into its 2018 season.

SurfaceTechnology GERMANY is the new incarnation of the long-running and highly successful O&S. Organisers, Deutsche Messe, took the decision to rebrand the show earlier this year. The show dates, location and display categories will remain unchanged, but it's more than merely a name change. The move from "O&S" to "SurfaceTechnology GERMANY" is a bold bid to extend the show's international reach.

"The name 'SurfaceTechnology' instantly conveys to our international target markets what the show is about," explains Olaf Daebler, director SurfaceTechnology at Deutsche Messe. "For many years now, it has been about a lot more than just surface finishing and coatings. As the new name suggests, SurfaceTechnology GERMANY will feature all materials, sectors and industry associations that are relevant to surface technology. What's more, the brand is already very well known, thanks to the SurfaceTechnology Area showcase at the Hannover Messe and our various SurfaceTechnology events abroad, such as our shows in Turkey and North America. This gives us a great foundation on which to launch our promotional campaigns aimed at attracting exhibitors and visitors to the show."

Part of the reason for the name change is to pitch the show to new categories of technology users. Chief among these new target groups are companies engaged in

pre-coating treatment, such as solutions for mechanical pre-treatment and adapting material surface structures to particular coatings. This change in focus is a response to requests by the show's exhibitors, who would like to see even more trade visitors from other countries, particularly neighbouring European countries, given the show's favourable location in Stuttgart. The other advantage of Stuttgart is that it is very close to key surface technology users from the automotive and mechanical and plant engineering industries, all of which are extremely well represented in the industrial heartland of southern Germany.

In terms of display categories, SurfaceTechnology GERMANY encompasses surface technology in all its various shapes and forms. This includes electroplating, shot-blasting, nano and micro technology, thermal spraying, industrial plasma and laser surface technology, coating materials, surface treatment, environmental engineering and supply systems, related services, pre-treatment, cleaning systems and measuring, testing and analysis equipment.

International focus and high numbers of decision-makers

The previous show, held in 2016 under the old 'O&S' branding, was already highly international, with 23 percent of the exhibitors and 21 percent of the trade visitors coming from outside Germany, mainly from neighbouring European countries. The trade visitors came from a mix of industries, primarily mechanical and plant engineering, automotive, metal, plastics, rubber, subcontracting, electronics and electrical. The show was likewise popular with skilled tradespeople and providers of custom coatings, who took full advantage of the networking and business development opportunities on offer. The 2016 show was



also very strong on quality visitors. An impressive 83 percent of all attendees play a major role in purchasing decisions and 80 percent had come with buying intent. Supporting program features forum, Guided Tours and themed display areas.

The organisers have announced that SurfaceTechnology GERMANY 2018 will carry over another tried-and-proven O&S tradition, a quality supporting program. Thus, professionals seeking to compare notes with their peers and keep up with the latest R&D findings will still be able to go to the SurfaceTechnology Forum (bilingual, German/English). The Guided Tours will also be back. They are a great way for visitors to get a quick overview of the content areas they're interested in, not to mention an excellent opportunity for exhibitors to pitch their products and innovations directly to relevant visitors.

Meanwhile, the keynote theme of intelligent water and waste water systems will feature strongly at another mainstay event, the Waste Water & Environment display area. Another long-running in-show highlight is the Surface Technologies Process Chain special display: a showcase dedicated to current solutions and future trends in custom coatings. Then there's the Nano/Micro showcase, with its focus on nano, micro and laser technologies. Highlights here include solutions for self-cleaning and scratch-resistant surfaces.

Well-established group pavilions will also be among the mainstays of SurfaceTechnology GERMANY. For

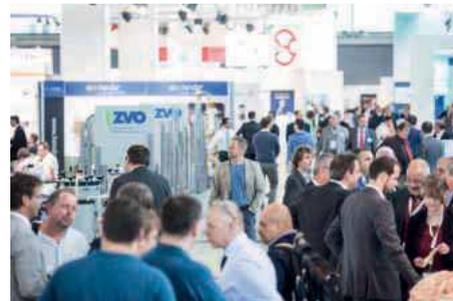
instance, the German Surface Treatment Association (ZVO) will again be staging its World of Surface Treatment pavilion, a leading platform for the latest solutions in electroplating and allied technologies. Contract processing specialists and suppliers of surface technology processes, plant and accessories will use the pavilion to present their market-ready products and innovative research projects.

The German Engineering Federation (VDMA) will stage a pavilion where its members will present solutions for maximising efficiency in industrial processes and achieving sustainable, cost-optimised production. Similarly, the German Enamel Association will run a pavilion featuring advanced processing technologies and new application scenarios from the enamel industry. Last, but not least, the German Federal Ministry of Economic Affairs and Industry (BMWi) will be running a pavilion that will provide subsidised exposure for young enterprises and startups from Germany.

Deutsche Messe AG

2017 marks the 70th anniversary of Deutsche Messe AG, which was founded in

1947 with the staging of Germany's first-ever Export Fair. Seven decades later, Deutsche Messe has taken its place among the world's top organizers of investment goods trade fairs, sporting a rich portfolio of events held in Germany and around the globe. With 2016 revenue of 302 million euros, the company ranks among the five biggest trade show companies in Germany. Its portfolio includes such world-class events as CEBIT (business festival for innovation and digitisation), CeMAT (intralogistics and supply chain management), didacta (education), DOMOTEX (carpets and other floor coverings), HANNOVER MESSE (industrial technology), INTERSCHUTZ (fire prevention, disaster relief, rescue, safety and security), LABVOLUTION (lab technology) and LIGNA (woodworking, wood processing, forestry). The company also regularly hosts a number of internationally renowned events by third parties, among which are AGRITECHNICA (agricultural machinery) and EuroTier (animal production), both of which are staged by the German Agricultural Society (DLG), EMO Hannover (machine tools - staged by the German Machine Tool Builders' Association, VDW), EuroBLECH



(sheet metal working - staged by MackBrooks) and IAA Commercial Vehicles (transport, logistics and mobility - staged by the German Association of the Automotive Industry, VDA).

With more than 1,200 employees and a network of 58 sales partners, Deutsche Messe is present in about 100 countries.

To register, visit:

www.surface-finishing-germany.de/en/register or telephone: **0049 711 18560 2200**

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Metal finishing fully covered by Ellesco at MACH

Visitors to MACH 2018 will benefit from the vast experience in the world of metal finishing on offer from Ellesco. In addition to being able to tap into the knowledge available from Ellesco's team, visitors will also see a wide range of market-leading equipment from the world's biggest manufacturers of deburring, grinding and polishing systems.

Ellesco has built its business on long-term partnerships with its suppliers, not least Netherlands-based Timesavers, the world's largest manufacturer of deburring and flat surface finishing systems. There will be four Timesavers machines on show, ranging from the entry-level 10 series manual grinder, a cost-effective and low vibration alternative to conventional grinding and deburring, through to the new 32 series 1100 WRB machine equipped with a combination of abrasive belt and rotary brushes for optimum automated deburring. Managing director, Vincent Simonis says: "We have a long and successful relationship with Timesavers, which has seen Ellesco install deburring systems across the manufacturing spectrum. As a world leader in this technology, Timesavers continue to lead the way in terms of productivity, efficiency and quality. We are proud to be able to



The Timesaver 32 Series can be configured with belt and brush materials

associate with the best and biggest in the world."

In brief, the Timesavers 10 Series machine features a moveable/tiltable head onto which a grinding disc and flap brush are fitted. Simply rotating the head through 180 degrees allows both aggregate materials to

be simply accessed. Ease-of-use for the operator is facilitated by the arm, which supports the weight of the head without any input from the operator, who simply moves it over the workpiece as required to generate a uniformly rounded edge on the part being processed. Parts are located on a vacuum assisted anti-slip mat on the machine's 1,300 mm by 800 mm work surface, with the distance between table and head facilitating the processing of parts up to 960 mm high.

Larger still is the new Timesavers 22 Series metal finishing and deburring machine. The display machine has been updated to the new 'house style' of design to tie in with the Red Dot design award winning 42 series machines. This new style creates cleaner lines to the machine and improved man/machine interface, including visual inspection capability for the abrasive medium. Available in three widths of 900 mm, 1,100 mm and 1,300 mm, the 22 Series can also be equipped with between one and three heads, combining contact roller style abrasive and rotary brush heads for metal finishing or deburring. The result is a cost-effective solution for the deburring of punched and laser cut metals as well as being capable of edge rounding and processing coated parts. Other features of the 22 Series machines are the robust, rigid table design, mounted on four synchronised



The Timesavers 10 Series manual deburring machine

spindles, dial-in digital thickness setting and read-out, frequency-controlled conveyor motor giving feed rates of 2.5-14 m/min. and motorised table height adjustment of between 1 and 125 mm.

The largest machine on show is the Timesavers 32 series, which provides an ideal solution for deburring, edge rounding, edge deburring, smoothing and/or finishing flat metal parts from stainless steel, mild steel, and aluminium. The featured 32-1100-WRB benefits from an 1,100 mm wide working area, allowing large workpieces to pass through a combination of belt and multi-disc or rotary brush abrasive material. The 32 Series delivers an efficient package thanks to its easy-to-use Siemens man/machine control interface, which is presented to the operator at a comfortable and convenient angle, ensuring a good view of the entire deburring process. Timesavers' quick exchange slide and easy lock disc system means that brushes and grinding media can be changed quickly and easily, while a wide range of rotary brush types are available. The use of multiple heads and media also allows pre-grinding of heavy burrs and optimum surface finishing to be completed in a single pass through the machine, improving efficiency considerably.

Additionally, for 3D components inside and out, Ellesco will continue the deburring focus by featuring the capabilities of WMS-Engineering, a world-leader in automated and robotic deburring systems. With over 40 years' experience in automation of the deburring process WMS has provided customers with stand-alone machines through to fully automated and production line systems. WMS will be on the Ellesco stand at MACH highlighting the

processes implemented and high-quality surface finishes achieved with WMS technology; including sample parts, controls, robots and tooling that go to make up an automated deburring cell.

While deburring takes centre stage, Ellesco will also exhibit machines suitable for weld dressing, re-finishing and polishing in the form of a KBM long-belt grinding machine for weld dressing and an Autopulit CNC polishing cell, which will highlight the level of surface finish that can be achieved using automated systems.

Exhibited for the first time in the UK, the KBM machines are the most popular and straightforward among Ellesco's weld dressing options. Generating negligible HAV, they are ideal for many different weld dressing processes, including preparation and removal, blending and shaping of seam welds and smoothing spot and puddle welds particularly on sheet metal fabrications, profiles and small housings.

In their basic configuration, they feature a flat machine table with twin offset supports, which can be adjusted for height via a chain and gear motorised system and have variable belt speed with belt widths of 100 or 150 mm. A higher specification with a 3-axis table and integrated handling mechanism makes holding, rotating and pivoting workpieces much easier. The component is secured by vacuum suction cups and the handling system is then operated via a foot switch, allowing the workpiece to be positioned relative to the



An Autopulit CNC polishing machine

grinding belt in three planes, which are pneumatically locked by the locking disc (infinitely) and/or via grid holes for added precision. The KBM machines can be supplied in a range of sizes to handle workpieces up to 4,000 mm in length and 1,500 mm wide.

Autopulit, a partner of Ellesco for 37 years, produces a wide range of polishing machines encompassing rotary transfer-style machines, gantry-style machines and fully automated robotic cells. This range will be represented at MACH by a CNC polishing cell. This CNC-controlled brush and mop machine features a universal head for satin finishing and high gloss finishing of components in five axes. This head can be equipped with a variety of rotary consumables and compounds to suit specific applications. Then, under full CNC control the consumable is manipulated over the workpiece at pre-set speeds and pressures to deliver either a polished, ground, or satin finish, the machine can also be used for deburring as well. Application areas are varied from aerospace and automotive to household goods and appliances. These CNC machines from Autopulit are just part of an extensive product portfolio that encompasses fully robotic cells, rotary transfer-style machines, gantry-style machines, reciprocating platforms and throughfeed systems. Bring your finishing and deburring problems to the Ellesco stand for expert advice.

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A KBM Long-Belt grinder



Clever, compact, polished

Swiss company, René Gerber AG, CH-Lyss is one of the world's leading specialists in micro-preparation of the cutting edges of cutting and punching tools. Its experience and comprehensive know-how in brush deburring and polishing is reflected in the new compact face-polishing machine, named CompactPolish and developed by the company.

Polishing, smoothing and finishing with the new CompactPolish

The demand from the industry for a compact design that still meets complex machining cycles with variable polishing forces has led to the innovation of the CompactPolish. The machine offers a clever solution for the machining of small parts in the Haute Horlogerie coin and medical technology and can be used to polish to a certain thickness and also ultra-fine polishing.

The CompactPolish is a consequent development face polishing machine enabling the best polishes and clean work. The new dispenser function distributes the polishing agent in drop form as a spray mist or as an aqueous emulsion in the machine, depending on the task. Due to the programmable panel, the machine is user friendly and the result is completely independent of the operator. The CompactPolish fulfils all these requirements and proves its efficiency at well-known companies in the coin industry.



The new CompactPolish surface polishing machine

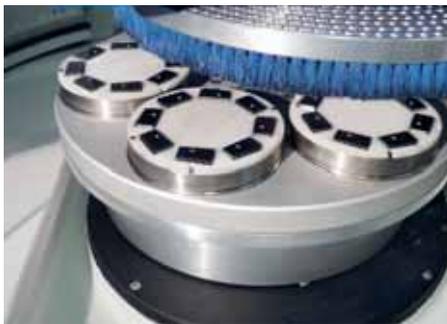
Reflective surfaces with the CompactPolish

When compactness redefines the process, polishing is taken into a new future: BeCompact is the credo for companies with the highest demands on surface quality and the finish of high-precision components. It is not only compact, it is also cleverly constructed and equipped with modern control technology. However, it is still the polish that convinces. The new CompactPolish is used for the machining of a wide variety of materials such as stainless steel, brass, ceramics, hard metal, plastics and composite materials.

The range of machinery at René Gerber AG includes machines for precise deburring, edge rounding and polishing. It is one of the world's leading specialists in the field of micro preparation of the cutting edges of machining and stamping tools. The many years of expertise in the area of brush deburring and polishing is particularly apparent in the new CompactPolish, presented at the recent GrindTec exhibition.

Cutting edge preparation of machine tools

Gerber brush polishing technology is recognised worldwide as a cost-effective, process-safe and proven process for the defined cutting-edge preparation of turning plates, profile cutting plates, drilling and milling tools, punching dies, dies and other tools. This technology not only produces defined radii in the micro range but also reduces the cutting-edge surface by a factor of three and polishes the clamping surfaces/grooves. The proven BP-MX system makes this possible.



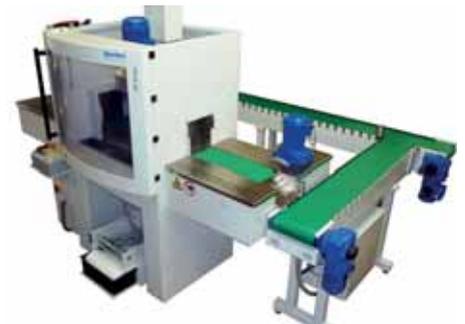
The BP-MX for cutting-edge preparation

In combination with the new DIAFLEX diamond brush technology, completely new possibilities for cutting edge preparation are opened up and symmetrical and

asymmetrical radii are reliably generated. The new technology generation has already been introduced at some tool manufacturers and delivers excellent results in rounding HM, CBN and PKD inserts.

Universal use with the BP-Smart

Gerber's proven BP-Smart brush polishing machine was also shown at GrindTec. This machine is universally applicable to being used profitably in research and development departments as well as in the production of parts. It brushes sharp edges and burrs, brushes defined radii or contours on edges and simultaneously polished the surface. It reproduces experimentally determined results with consistent accuracy and is therefore definitely worth looking at.



The BP-Smart brush polishing machine

The BP-Smart PBK is a cost-effective, stable and precisely constructed transfer brush deburring machine. High performance is provided by a stable planetary head, which makes it possible to deburr and round flat contours with complete precision. This makes the machine ideal for machining punched and fine blanked parts, planetary and pump wheels and even lapped and precision-ground parts on a larger number of pieces.

The BP-Smart PBK transfer deburring machine rounded off the offering at GrindTec, which demonstrated the full competence of Gerber as a manufacturer of precision machines for deburring, honing and polishing of small to large production batches in the field of metal and hard material processing.

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ARKU

Fine parts production with the EdgeBreaker 4000 Plus

KTS GmbH – Technologiepark Stahl specialises in flame cutting and CNC milling with subsequent parts refinement for customers from the mechanical engineering and commercial vehicle industry

For a long time, employees with angle grinders handled the deburring, a process that plays a key role in the parts quality. An automated deburring solution had become essential to maintain efficiency with large order volumes.

In 2015, ARKU offered the company a trial run at the expanded Leveling and Deburring Center in Baden-Baden. Here customers can use the newly developed EdgeBreaker® series for deburring tests or order contract work. KTS brought along especially complex parts for its machine test. The underlying idea is that if the EdgeBreaker can cleanly deburr these pieces, then it is without a doubt the right system. The strategy was a success, as Mario Koch, managing director of KTS, explains: "The EdgeBreaker 4000 Plus not only deburred the parts effortlessly. It also removed large burrs from both sides. That was the deciding factor for us."

KTS specialises in the welding and CNC milling of steel with subsequent part refinement. To increase its efficiency for larger orders from mechanical engineering and the commercial vehicle industry, KTS utilises the automated deburring solution from ARKU.

The EdgeBreaker 4000 Plus not only made KTS' processes more flexible, the



company manufactures with lower costs, faster and achieves better results, which constantly fulfil the 1090 DIN standard that has been in force for a number of years. Employees who were previously needed for manual deburring are now free to handle other tasks and with the deburring machine, the company benefits from a clear market advantage. "With the machine, we can deliver more quickly and react to customer requests rapidly. This strengthens our position as a high-quality supplier," emphasises Mario Koch.

"The EdgeBreaker 4000 Plus removes burrs from our parts within only a few minutes. This enables us to safeguard the high quality which we are well-known for among our customers."

The ARKU deburring and edge-rounding machines process punched, laser, plasma and oxyfuel cut parts. They ensure increased cost-effectiveness thanks to dual-sided and rapid processing, additionally with extremely low consumable costs. These machines offer efficient deburring and edge-rounding, whether for smooth or



coarse sheets/parts and with either small or large burrs. ARKU offers the right machine for your individual needs and processes. Even burrs with a thickness of more than three millimetres and parts up to 80 mm thick are efficiently processed and prepared for smooth downstream processing - leveling and deburring from a single source.



Innovation and precision.

With 90 years of experience in sheet metal processing, ARKU is one of the leading experts for sheet metal processing machines. As the technology and market leader in leveling technology, the company offers the world's broadest spectrum of high-performance precision levelers. These range from levelers for thin or complex parts to straighteners for thick plates and even AHSS materials. All these systems ensure perfectly flat, stress-relieved sheets and parts.

ARKU also integrates its coil straighteners into finished press feeding lines, cut-to-length lines and stamping systems for coil materials along with coil preparation systems for roll forming lines.

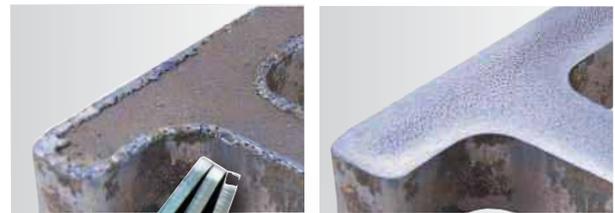
As an innovation leader, it has expanded its range of expertise to include deburring, edge-rounding and oxide layer removal with a line of deburring machines. Leveling and deburring are perfect complements for sheet metal processing and ensure outstanding results.

Two fundamental steps in sheet metal processing are now available from a single source- from the experts in leveling and deburring technology.

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How to gain that all important competitive edge and a superior surface finish



Costa offers one of the widest ranges of machines for the rapid and efficient deburring, grinding and polishing of ferrous and non-ferrous metal parts, sheets and coils.

Uniform grinding pressure is applied to the inside and outside contours of the components to deliver the highest standards of finish required for parts up to a thickness of 120 mm.

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Costa consistently sets the benchmark for deburring and surface finishing machines - offering users a faster payback, higher productivity, lower labour costs with reduced abrasive consumption.



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Deburring experts for over 40 years

The history of the patented FLADDER® denibbing, finishing and deburring system goes back to 1974, when the Hansen & Hundebøl Development Centre was established. The idea was to develop a solution to manufacturers with a need for automation or rationalise their production process. Hansen & Hundebøl developed a variety of industrial machine solutions for various industries.

From the end of the 70s to 1995 the production was aimed at the woodworking industry, but due to an increasing demand the products were also being used by the metal industry and are sold to a wide range of industries.

To support the brand internationally and create a relation between the company name and the brand FLADDER, the company name was changed from Hansen & Hundebøl to Fladder Danmark A/S.

The 1970s saw the FLADDER Abrasive disc Development and patenting of a special, flexible abrasive tool to be used for lacquer sanding by the furniture industry. In 1981, the company participating in the first exhibition in Stockholm, Sweden and abrasive tools were exhibited together with a machine for sanding edges. At this time, FLADDER was introduced as a trademark. Shortly after, manual machines were



developed and the first automatic feedthrough machine for denibbing of, for example, kitchen cabinet doors was presented at the LIGNA exhibition in Germany:

Further developments in the 1980s included the FLADDER 300/FINI, an economy machine with two counter spindles and the FLADDER 300/RT, a machine with a carousel-shaped bed for finishing non-flat workpieces.

Other additions to the range included the 300/US, a machine with two counter rotating spindles for denibbling the back

side of workpieces, the 300/US with two counter rotating spindles for denibbing the back side of workpieces, the Historie 300 LS for long, straight workpieces like mouldings, skirtings, window profiles etc., built section- and modulewise to meet customers' specifications, the FLADDER 300/VS for vertical processing of workpieces, used by manufacturers of i.e. doors and windows and built for workpieces up to a height of 3,500 mm.

More innovation followed with the 300/GYRO, the next generation of feedthrough machines for flat workpieces, with increased sanding and integration in automatic lines plus new gearhead technology with six counter rotating spindles and multiple movements offered a unique surface and the next generation FLADDER AUT 1000 VAC and FLADDER SC for non-flat workpieces.

The new hand-held machine FLADDER 150/MICRO replaced the old model, while the FLADDER GYRO-SC with GYRO technology was produced as a special machine for polishing car panels. Meanwhile, the 3rd generation of the FLADDER AUT 1000 VAC featured an oscillating sanding movement and a new type of shield for better supervision.

Recent developments include the FLADDER 400 to meet the aircraft industries' demand for deburring their machined parts. The new lock-it™ spindle system has been introduced and has become an important part of the FLADDER machines.

The lock-it™ spindles make it faster and uncomplicated to change tools. The fixing is



done by means of the elastic bands that also centres the tools better.

The 2nd generation of LS is built with a cylindrical body. The more flexible construction that makes it possible to position the modules 360 degrees in relation to the workpieces.

The model AUT has been replaced by the 4th generation FLADDER 200/GYRO, equipped with the latest technology from the GYRO series.

The FLADDER 300/GYRO is equipped with a powerful gear head mounted with six cone spindles on which different kind of spindles can be used. The spindles are in pairs counter rotating while the complete gearhead is performing an oscillating and rotating movement over the surface of the workpiece.

Uniform finishing of workpieces and uniform wear of the tools is carried out in four movements. To simplify the operation of the machine the four movements are synchronised two by two.

Features include: the central head carrying the tools is an extremely strong and compact unit; the gear head is mounted in an ingenious, unique scissor-type suspension system; by means of a powerful

vacuum system, even small workpieces are held safely during the process. The width of the vacuum belt is 1,300 mm; the control panel includes a touchscreen to ensure an easy and manageable operation of the machine; the machine body is powder coated and solid built with strong shields that offers a perfect view of the process through the large windows.

The gear head is a very solid construction, while the housing of aluminium has outside cooling ribs and inside room for the special cut toothed wheels in chrome vanadium steel. The force from the main motor is transferred directly to the six spindles.

The gear head with the main motor and rotating motor is mounted on a scissor suspension frame. The scissor is equipped with special hardened, grinded wheels, making it possible to create the linear, oscillating movement across the conveyor belt. This, combined with the pair of counter rotating spindles, results in uniform workpieces and uniform wear of the tools.

The pressure towards the workpieces are created by means of the centrifugal force, specifically through regulation of the rpm.

As an option the vacuum motor can be controlled by a frequency inverter. When



processing large pieces, the vacuum effect can then be set to only the half and thereby save energy. The other motors in the machine are as standard controlled by frequency inverters.

Another option is an energy saving system, that works by means of a laser beam that detects the flow of workpieces in the machine. If the flow of work pieces stops the machine will stepwise be shut down. This saves energy and avoid unnecessary wear of the tools and the machine.

Fladder Danmark A/S
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www.fladder.dk

MACH • Stand: H6-702

Branding refresh and new brochure for Master carbide burrs

After many decades of providing industry with high quality carbide burrs, supported by technical application advice, Master Abrasives has released a new carbide burr brochure in line with its plans to increase stock levels in 2018.

The new brochure is designed with the Master® brand's updated look and contains a cut selection guide on Master cut types for use on materials such as aluminium, cast iron and unhardened steel. A table for each burr shape, from cylindrical to cone, provides a list of standard burr sizes and a code relating to each item's dimensions.

Managing director Paul Batson says: "Improving competitiveness through better productivity is a major factor driving business in the UK. Our message is that we will work with customers to find the best solution to their application, whether that's a standard stock item or a specially developed design for the application.

"We have a team of experienced technical sales representatives that can help assess the application requirements and a manufacturing team that works on

developing the most cost-efficient production method for carbide burrs."

All tungsten carbide rotary burrs from Master Abrasives are CNC machine ground from carefully selected grades of tungsten carbide designed to produce high stock removal rates together with long life. The bespoke fully automated manufacturing process and subsequent rigorous burr quality testing ensures a reliable product that on many occasions exceeds the customers' expectations.

Master tungsten carbide burrs are produced in a wide range of shapes and sizes, mounted on 3 mm or 6 mm shanks as standard or 8 mm shanks on request. The company is reviewing its stock levels with the plan to increase availability of standard burr sizes to meet demand in 2018.

Special shapes, sizes and flute cuts can also be supplied to customer specifications with the help of Master Abrasives' technical applications team. This includes a range of long shank and double ended burrs which allow access to hard-to-reach areas and solve long reach application problems.



Master kits of carbide burrs include a set of five double cut burrs on a 6 mm shank and a set of ten double cut burrs on a 3 mm shank, both in a Master branded presentation box which provides storage and protection. The selection of burrs in each kit provides a range of shapes which allows customers to try the different types for their applications.

Contact Master Abrasives or your local distributor for your hard copy of the new Master carbide burr brochure:

Master Abrasives
Tel: 01327 703813
Email: sales@master-abrasives.co.uk
www.master-abrasives.co.uk

Threading tools – customised processes for different requirements

During the manufacturing of metal workpieces, very often it is necessary to machine threads. Mainly when the workpieces have to be mounted or assembled to other parts, screw connections are unavoidable. Generally, there are two different ways to create threads: cutting ('taps') which is the most popular one and forming ('forming tools').

Thread forming has the advantage that the microstructure is just deformed. In this way the fibre flow is not broken, which is increasing the material strength and extraction force. As different as the processes for thread cutting and thread forming are, as different are the requirements to the tools.

During the manufacture of taps, the grinding process creates burrs between the thread profile and the chip flute. Burr-free grinding is simply not possible, so extensive finishing is absolutely essential. If the taps are not deburred, then adverse effects on the geometry of the cutting edge cannot be excluded. What is more, burrs on uncoated tools can interfere with the cutting edge during chip removal or break off and damage the cutting edge and thereby considerably reduce tool life, impair the quality of the surface and degrade dimensional stability.

Even in the case of thread formers, the conventional production process leaves grinding ridges, which have a negative influence on the friction between the tool and the material to be deformed. The ridges

Processing of taps

Conventional process:



Stream finishing with pulse drive system (Pulsfinish):



Comparison of production processes: With the OTEC Pulsfinish, production steps can be saved

also favour the fixing of the material in the forming grooves.

OTEC has developed several surface finishing processes of threading tools. In stream finishing machines with pulse drive (Pulsfinish), the tools can be processed reliably, quickly and economically according to the requirements. The principle of pulse finishing system is based on the precisely defined and rapidly repeating relative movement between media and workpiece. Here the clamped workpiece is immersed in the media stream of the rotating drum where it is quickly accelerated to a speed of over 2,000 rpm, then it is decelerated again and accelerated once more. The differing speeds resulting from the inertia of the media in the drum and the rapid change of workpiece speed give rise to an extremely intense and precisely controllable abrasive effect.

Compared to conventional processing methods, several production steps can be saved using the pulse finishing process. Deburring, smoothing and rounding of the

edges in one operation enable time and cost savings. A surface which has been treated with the OTEC process also improves the adhesion of the subsequent coatings and extends the tool life.

Cutting tools - deburring of taps

Taps in general need a deburring process after the tool grinding. With the conventional brushing method, never all burrs can be removed, which affects the later coating negatively. Non-removed burrs break off and create uncoated areas that wear more quickly. In OTEC's stream finishing machines with pulse drive (Pulsfinish) workpieces can be deburred within several seconds up to some minutes.

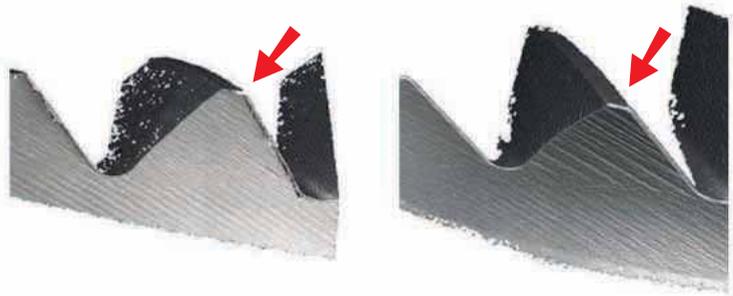
Defined rounding of taps

Cutting edges can be rounded to a defined measurement. By setting the parameters container and workpiece rotation speed as well as the immersion angles the geometry of the taps can be modified in order to match the requested and optimal shape.

Defined smoothing of forming tools

The requirement is mainly to flatten the surface. The main task when machining thread formers is to evenly smoothen the entire tool surface. A smooth surface reduces the formation of material in the forming grooves and reduces the friction between the tool and the material to be deformed. Depending on the requirements, the defined rounding of certain functional edges is also necessary. By using a surface finishing process by OTEC it is possible to match such requirements. Compared to competing processes, for example shot blasting, the OTEC process is pricewise very





Tap unprocessed (left) and processed (right) in OTEC machines

interesting and at the same time quite flexible, as it adapts to different workpiece shapes. By this finishing process, the deformation forces can be reduced by about 60 percent.

The use of the stream finishing machines with pulse drive (Pulsfinish) is giving the possibility to work with high energy and small and abrasive media. The finishing target is achieved in about 1 to 2 minutes, depending on the size of the tap and the requested result. The media used is also smoothing the surface of the tools which is giving advantages in the coating behavior and tool life. The process is very flexible and adapts to every dimension and shape of taps. At the same time, the wearing of the media is low, what makes the process quite

economical. In addition, stream finishing machines from OTEC are highly economical, since a single machine can process a large number of workpieces at the same time, depending on the requirements of the job in hand. Workpieces can be changed quickly with automatic door or even automatically by robot.

OTEC GmbH offers precise technology for perfect surface finish. OTEC machines for deburring, grinding, smoothing and polishing guarantee an efficient and perfect surface finish of tools and products. Operating a worldwide distribution network comprising over 60 agencies, OTEC is represented locally for international customers from various industries.



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OUR PARTNERS





Rainford puts component finishing in a Finespin

To complement the new Finecut micro abrasive waterjet cutting machine, Rainford Precision has now added the Finespin® polishing and deburring machine to its product range. Available exclusively in the UK from Rainford Precision, the new Finespin machine was initially developed to finish micron-precision components produced on the Finecut micro abrasive waterjet cutting machine.

The benefits of the new Finespin machine make it the complete polishing, deburring and component washing system for small and medium sized components up to 8 kg. Suitable for processing machined, die cast, waterjet, stamped and wire EDM manufactured parts with complex geometries, the new Finespin range is ideal for manufacturers in the medical device, aerospace, jewellery and small component sectors.



The Finespin polishing and deburring range is available in four models, the F28, F35, F45 and F50. Powered with a single phase 240 V supply, the compact machines have a maximum component capacity of 1, 3, 5 and 8 kg respectively. The smallest F28 model has a 280 mm by 280 mm work table, while the largest F50 can support parts up to 600 mm by 540 mm.

Best described as impact polishing, the Finespin series operates with extremely small rotating steel pins and a polishing fluid which combine to remove burrs, round sharp edges and clean components in a single operation. The pins are supplied in a variety of sizes down to 0.2 mm and this supports the polishing and processing of the most finite details on small components. This particularly fine polishing media prevents components from receiving surface damage and distortion whilst the dimensional tolerances of parts remain unaffected.

Operation of the new Finespin range of machines is extremely simple and operator-friendly, with an intuitive interface

that allows the operator to load the machine with pins, parts and polishing fluid and then just press start. Furthermore, the machine has particularly low consumable and operational costs. Polishing cycles are fully programmable and the process is often complete within 10-20 minutes. For manufacturers of particularly small or delicate components, this meticulous process eliminates the potential for over enthusiastic or heavy-handed manual finishing that could result in component scrapage.

For further details, contact Rainford Precision, the experts in micro-manufacturing.

Rainford Precision Machines Ltd
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The Science behind

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Engis (UK) brings two new polishing products to Optatec

Superabrasives specialist, Engis (UK) Ltd is bringing two newly developed polishing slurries to its stand at Optatec: En-Sapp and En-Cer.

En-Sapp, a polishing slurry for C-plane sapphire, has an ultimate crystal size of 0.3 - 0.5 um and can produce high quality surfaces to 0.2nm Ra. The product's high percentage of solids means that it can be diluted with water to reduce processing costs, while its high stock removal rate makes it many times faster than colloidal silica. Furthermore, its non-crystallising formulation results in reduced machine down-time and maintenance, so increasing efficiency and extending machine life.

En-Cer glass polishing slurry is a versatile product which can be used on both pitch and pad polishers and has a 0.8 - 1.0 um soft particle size, offering reduced polishing times while producing high-end surface quality (0.2 nm Rq BK7 & Fused Silica). This product also has a high solids content and can be diluted to achieve optimum performance on different types of glass and, in addition, suffers from no freezing

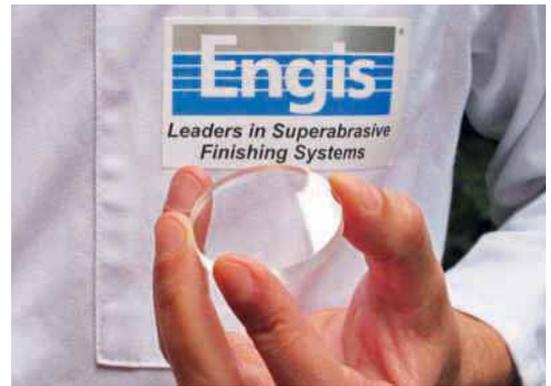
restrictions, so can be supplied over winter months, so reducing inventory and costs.

Both En-Cer and En-Sapp can be re-circulated, so reducing processing costs and increasing efficiency.

Engis has developed a complete range of diamond slurries, as well as complementary micro-graded alumina and colloidal slurries, for every precision lapping application. These slurries excel in the lapping of ceramics, metals, sapphire, silicon carbide, gallium nitride, and mechanical seals.

The diamond slurries deliver to you a faster, greener and more cost-effective process over lapping with conventional abrasives. In addition to the aggressive cutting ability of diamond, formulations provide you with superior surface finishes, faster part clean up, greater efficiencies and significantly less waste to dispose of.

Engis is a diamond microniser, giving it 100 percent control over the Particle Size Distribution (PSD) of the diamond abrasive



used in its slurries. Thanks to the stringent controls it has over the PSD, it can eliminate stray coarse and fine particles providing you with a slurry formulation that cuts faster and finishes better than other products in the same nominal micron size.

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OPTATEC Hall 3.00 Stand G53

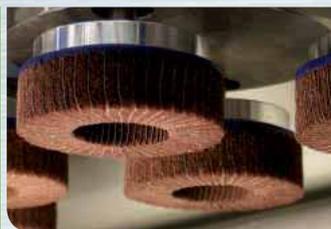
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Simple, effective crosshole deburring of complex metal parts

By integrating flexible hones in the machining process, complex parts with cross-drilled holes and other difficult-to-access features can be deburred in house, at less cost

In automated machining, removal of burrs and sharp edges in cross-drilled holes and other difficult-to-access areas such as undercuts, grooves, slots, or internal holes can be tedious and time consuming. One particular challenge is deburring the intersection of cross-drilled holes frequently found in engine and transmission components.

Despite the challenges, the removal of burrs from the production process is an absolute must for high quality, precision parts. In many applications, cross-drilled holes act as conduits for fluids, lubricants and gases. Failing to remove burrs can cause blockage of these critical passages or create turbulence in the flow. Burrs can also lead to part misalignments, affect dimensional tolerances, and limit the overall efficiency of machined components.

"Getting rid of burrs is really important because if there is any loose material that gets dislodged when the product is in use, it can cause major problems," says Anthony Scott, lead machinist at Orange Vise Company, a manufacturer of machine vices and quick-change fixturing components.

Although there are many techniques for deburring internal passages at cross-holes, the majority require sending out parts or investing in equipment to complete the work in-house that can cost tens of thousands of dollars.

These options, which include thermal, abrasive flow, electrochemical, and



Needs deburring

high-pressure water, effectively remove excess material but they also build time into the manufacturing process and add to costs.

The more ideal option for many machining operations, however, is to integrate deburring into the automated process with a simple, effective crosshole deburring tool such as the Flex-Hone from Brush Research Manufacturing. By doing so, operators can speed up the manufacturing process and ensure uniform quality for precision parts.

According to Anthony Scott, flexible hones are ideal because it is a cost-effective solution to smooth edges and produce a

blended radius for crosshole deburring:

"It is really about accessibility, because there aren't really any other tools that can do what a Flex-Hone can. Whether it is internal grooves or multiple cross holes, there is really no way to reach those areas with any sort of other tool."

For engineers in the automotive, aerospace, manufacturing and machining industries, the ball-style hone is a highly specialised abrasive tool that is instantly recognisable by its unique appearance.

Characterised by the small, abrasive globules that are permanently mounted to flexible filaments, the product is a flexible, low cost tool utilised for sophisticated surfacing, deburring and edge-blending.

Available in sizes ranging from very small 4 mm diameter hones to those up to 36 in or more in diameter (a size appropriate for large engine cylinder bores), these deburring tools can be custom designed to the size, shape and abrasive grit to fit any application's needs.

"I used the Flex-Hone quite a bit when I was working in aerospace," explains Ken Spaulding of Zodiac Engineering, a contract manufacturer in California. "We did a lot of parts that involved tubes with multiple crossholes and slots. Getting inside there to



Before and after

reach the burrs, particularly if the walls were thick, is extremely difficult.”

With a background in aerospace parts as well as mould making, Ken Spaulding is currently focused on creating products of his own design, such as high-end pocket knives and cycling components for BMX, road and mountain bikes. He also continues to perform contract manufacturing work.

He particularly appreciates how the flexible hone’s abrasive globules each have independent suspension that is self-centring, self-aligning to the bore, and self-compensating for wear, all of which facilitate close-tolerance finishing work.

“The hone conforms to whatever you are working with, even if it’s irregular. For example, if the back side of the part is not flat or not on consistent level plane in Z, the tool is flexible enough to still remove any burrs.”



Metalworking

For best results, the deburring tool is typically rotated into the main bore into which the crossholes break. After a few clockwise strokes, the tool is removed and the spindle reversed to rotate and stroke the flexible hone in a counterclockwise direction for a few more strokes.

The forward and reverse rotation creates a symmetrical deburring pattern. Coolant should be used to keep metal cuttings and deburred metal in suspension.

According to Anthony Scott, although the Flex-Hone is often used with automated production equipment it can also be used for secondary deburring options offline as needed:

“The tool can be used in CNC machines as well as with a cordless drill. So, if you manage to deburr 90 percent of the holes in a machine but have a few left you can’t access easily, you can use it with a handheld drill and maintain the uniformity in surface finish and process.”

Additional customisation from Brush Research in a variety of shapes is also possible to meet the requirements of non-traditional applications. This includes spherical-end configurations, stepped or multi-diameter configurations for double



Cross hole deburring

diameters and counter-bores, tapered or cone shapes, segmented shapes, or combining Flex-Hone globules with other filament materials.

For more information, contact:

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Your partner in precision honing and grinding equipment



SSP Technology Ltd is the exclusive UK agent for the world’s finest honing and manual NC and CNC controlled grinding machines, as well as filtration and cooling systems, air filtration systems, honing and lapping consumables and lubrication fluids and much more.

The main brands represented include Pemamo, Schneeberger, Palmary, Dama, Joen-Lih, Wimmer, Dedtru, Schilling and Farman. SSP can also provide technical project management and organise and oversee customer trials if required.

A purpose-built demonstration and training facility houses a constantly updated range of products. Currently these include a Schneeberger NGP tool and cutter grinder,

a Palmary centreless grinder, a Joen-Lih NC surface grinder and a Wimmer cut-off machine. SSP can also advise on and act as consultants for any honing, grinding, lapping or part marking project you may have and is a Rolls-Royce approved supplier.

SSP Technology regularly attends and exhibits at national and international trade shows, recently at GrindTec 2018 in Augsburg and in the future EMO 2019 in Hannover. The exciting news is that SSP has also booked a stand at MACH 2018. The stand will showcase the Pemamo MVRL160 precision honing machine, a Schneeberger Aries NGP 5-axis CNC tool and cutter grinder and a Palmary PC12S NC centreless grinder.

The company has grown over the last five years to position itself as one of the UK’s leading honing and grinding machine suppliers, supporting customers with sales, a dedicated demonstration facility and service department. The personnel have more than 50 years of honing, grinding and lapping experience.

SSP provides a full consultancy service on



every aspect of honing, grinding, lapping or part-marking projects, as well as supplying the world’s finest machines for these tasks. It can meet your exacting needs for general honing and lapping consumables, with impartial, straight forward technical advice from the honing and grinding experts.

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High-end honing technology

The best process for exact bores

Honing is the most precise metal cutting process for the economical high-precision machining of bores. It offers the highest precision in dimension, shape and surface.

KADIA develops high-end honing technology for small to medium-sized bore diameters. With the Smart Dynamic concept, the company offers the most advanced procedures for honing of precision components.

Honing procedure - a glance inside

Honing or long-stroke honing is a machining process with a geometrically undefined cutting edge for the high-precision finishing of bores. The achieved dimensional, geometrical and surface tolerances are less than 1 µm. Typical characteristics of the honing process include: simultaneous overlaying of rotation, oscillation and tool feed; surface contact between the abrasives and the bore lining surface; surface cross-hatch finish as a result of kinematics; coaxial alignment of tool and bore by defined degrees of freedom.

Honing procedure at KADIA

KADIA's honing processes are ultra-precise when it comes to fine machining of small to medium-sized bores. This is a worldwide unique feature. Whether for stock removal and target dimension honing, plateau or match honing, the process relies on KADIA's know-how, cutting-edge software and high-tech equipment.

In order to meet the highest quality demands of its customers, the company only develops vertical honing processes for directly driven honing spindles with expanding honing tools.

Finest industrial manufacturing applications

This honing technology is indispensable wherever there is a need to improve the functional sliding, guiding or sealing properties of contact surfaces in bores. Typical applications include injection systems, vehicle transmission, turbochargers, hydraulic components, small engines and functionally critical components of the aerospace industry. Advantages of KADIA honing technology include: accurate diameter control; high-precision bore geometries; production of almost any desired surface; nominal diameters starting from 1 mm; cost-efficient production process.



Smart dynamic honing technology

High-precision surfaces and tightest shape tolerances: this is a challenge that KADIA is ready to face on a daily basis in its development work. As part of its innovative honing technology, it coordinates the process steps in a precise, reliable and economical manner. The only way to achieve a result worthy of the name KADIA is to optimally interlink all parameters involved in the honing procedure.

Less complexity and more efficiency – this is what KADIA Smart Dynamic honing technology stands for. The concept is based on two main components: the intelligent HMC100 honing controller and the highly-dynamic LH honing spindles.

HMC100 honing controller - intelligence meets intuition

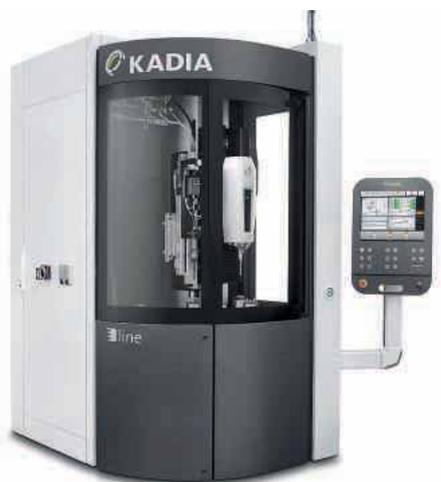
The model number HMC100 defines the honing controller of the future. KADIA is setting new standards in the operation of honing machines. In order to reduce complexity and to make honing even easier, it is continuously developing intelligent software. The advantages of a simple navigation structure are transparency and operating safety.

Highlights include: state-of-the-art honing and measuring programs; user-friendly 19" touch display; statistics module for process control; latest generation of hardware with SSD drive; greatest possible flexibility for future options.

LH honing spindles

Dynamic, highly productive and patented, KADIA's patented innovation, the Lean High-speed honing spindles work on the basis of an advanced direct drive technology. Both LH2 and LH3 variants are consistently targeted on dynamics, precision and long service life.

Highlights comprise: compact and modular design; ultra-precise radial spindle runout; stroke drive with 5-year warranty; internal coolant supply to the tool; extremely high material removal rate achievable.



KADIA Produktion GmbH + Co Tel: 0049 7022 60060

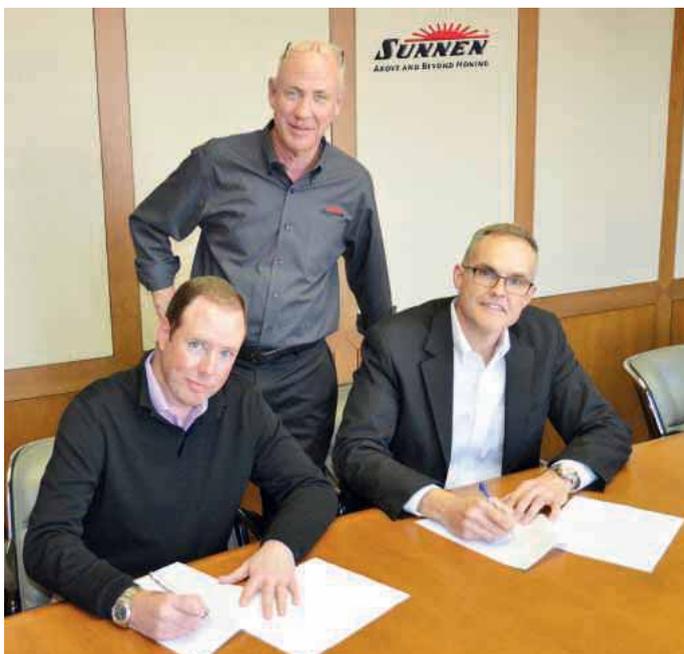
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Sunnen Products Company acquires BTA Heller

US-based honing systems manufacturer acquires premiere deep hole tooling and systems manufacturer to provide complete bore creation and finishing solutions

Sunnen Products Company has acquired BTA Heller Incorporated, the US-based manufacturer of deep hole tooling and systems for primary hole generation. This move aims to expand Sunnen's industry leading honing expertise to include tooling for initial hole creation and other complementary bore sizing and finishing processes. The company will retain the BTA Heller name as a wholly owned subsidiary of Sunnen Products Company, as the companies build on natural synergies to offer complete bore creation and finishing solutions.

Sunnen is the world's largest vertically integrated manufacturer of honing systems for precision bore sizing and finishing. Core technical competencies include automated and manual honing systems, custom system development and integration, abrasives, tooling, lubricants, and gaging. The company recently introduced the new SHD series skiving and roller burnishing system with tooling supplied by BTA Heller.



"BTA Heller is a natural fit for Sunnen. Our companies complement each other very well and BTA Heller's reputation in the industry for deep hole drilling expertise is unsurpassed," says Chris Miltenberger, president and COO of Sunnen Products Company. "The transfer of knowledge between the two companies will create a unique value proposition for our customers. And, with this acquisition, no other deep hole/BTA company will have Sunnen's global presence for technical and post-sale support."

The Heller roots trace back to Germany more than 100 years ago. BTA Heller started in 1952 in Troy, MI as American Heller. In 2007, the company name changed to BTA Heller and it has continued to produce unique tooling and processes for gun drilling, single tube, BTA, and double tube/ejector drilling systems, among others.

"We have developed various tools and systems for creating intricate internal profiled deep hole drilling from 0.5 in. to 36 in. diameter," says Mark Sollich, president and CEO of BTA Heller. "To combine forces with Sunnen and its bore geometry expertise creates a company not found anywhere else in our industry. No one company can provide a total bore solution from the creation of the primary hole to the final bore finish specifications like we can."

Mark Sollich will continue at the helm of BTA Heller after the acquisition, under the Sunnen Products Company umbrella.

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Integrated measurement solution for tool, die and component manufacturer

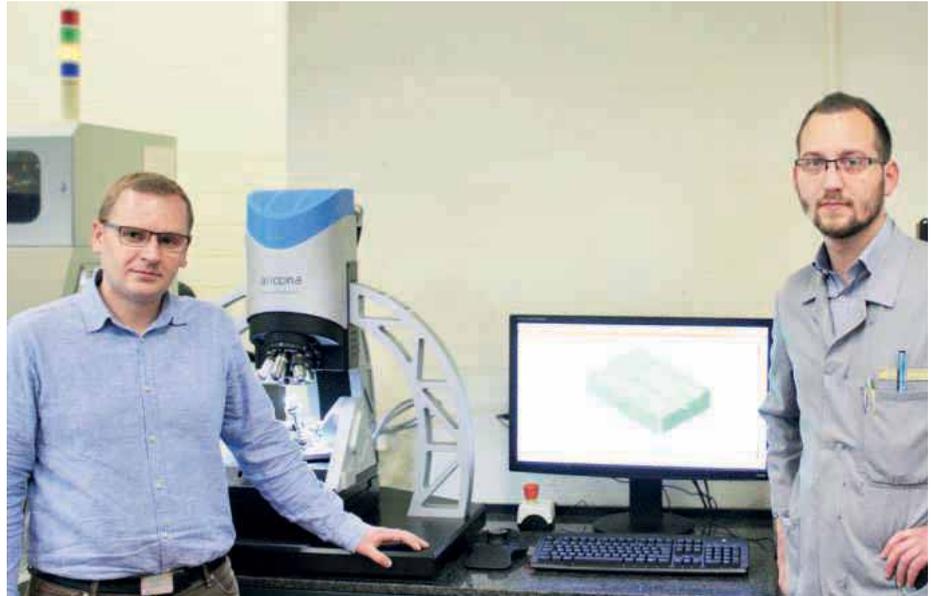
Fritz Stepper GmbH & Co.KG is a technology leader in the stamping sector and is known worldwide for its introduction of modular stamping tool construction. It produces several billion contact parts per year. In the area of quality assurance, the company has relied on Alicona, the provider of 3D optical measuring technology, for many years. Now Stepper is expanding its automation in the production environment to include Alicona measuring systems. These measuring instruments operate automatically and are in use 24 hours a day seven days a week.

When a stamping tool is used to make seven plug connections simultaneously it produces 16,100 contact parts every minute. The head of laser ablation and high-speed cutting at Stepper, Marcel Heisler comments that the one thing that applies, above all, to this throughput is "We have to measure, measure, measure."

Its customers, who come mainly from the automotive industry, have high demands for precision, accuracy and productivity. This is true for all high volume production for industry.

To achieve this level of productivity, accuracy and surface finish the stamping tool has to be of a very high quality in terms of material, surface quality and geometric shape. It is only when the tool is 100 percent correct can this be achieved.

In order to ensure the quality of its pressing and bending dies, Stepper has been relying for many years on Alicona, one of the leading manufacturers of high-resolution optical 3D measuring



systems for form and roughness measurement of micro-precision dies and parts.

3D measurement technology for final inspection and development of high-performance punching tools

In Fritz Stepper GmbH, Alicona is used for both continuous quality assurance of the manufactured parts in addition to the continuous development of the stamping tools with regard to material, surface quality and accuracy. As this is only possible with completely reliable measurement results, the Pforzheim-based toolmaker has been using Alicona optical 3D surface measurement technology since 2010. Marcel Heisler says: "Before Alicona measurement was introduced, we had massive difficulties measuring our tools with steep flanks, smooth surfaces and different reflection properties. The knowledge we've gained from Alicona from the beginning has brought us incredible progress and is the reason that we have invested in the automation of our Alicona 5-axis measurement system."

Another reason is that Alicona provides a wide range of measurement applications in only a single measuring system. This allows both dimensional tolerances and surface quality measurement on different component types, shapes and sizes, plus it can measure the difference between the tool and component.

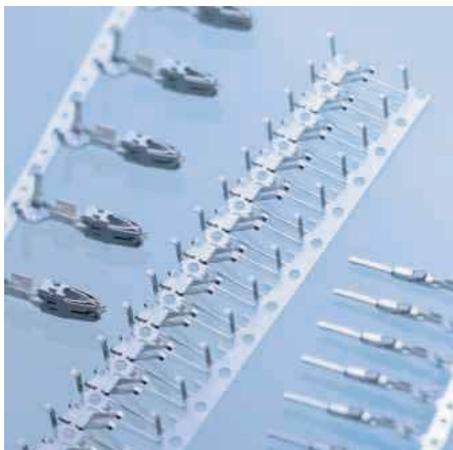
Marcel Heisler says: "We do not know of any other system on the market that offers such a wide range of applications. We can measure just about anything."

Automation from design to measurement technology

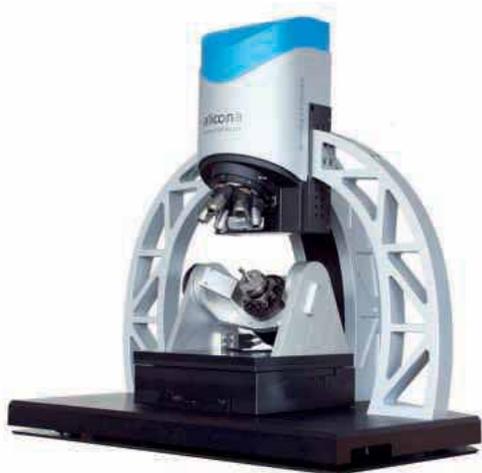
Precision and innovation are demands that both Stepper and Alicona has in common. Both companies are regarded as pioneers and drivers of their industry. This is being proved once again with the implementation of the latest Alicona technology into the Stepper production process that allows unattended automation of the measurement process.

Digitisation, networking and communication of all production systems are becoming increasingly important in high-volume production. Part of the modern production strategy is also to place measurement technology as an integral part of production. This is different to having an inspection process at the end of a manufacturing cycle, as, by placing this in production it ensures that the finished product is right every time. This can be readily achieved with the optical metrology systems offered by Alicona.

A further requirement with these integrated automatic measuring systems is that they can be operated by multiple users without any previous knowledge of measuring technology, this allows Stepper



to have flexibility across manufacturing shifts ensuring measurements are not affected by user influence. Alicona offers this automation with the "automation manager" interface. This software interface enables the user-defined configuration of a measurement series for form and roughness measurement to be set by an administrator on a reference component, this series is started by an operator, in production, at the push of a button. Control and evaluation are fully automatic, taught-in parameters are



measured and measurement reports directly created with "go-no-go" results.

Stepper is currently introducing the "automation manager" in its production. Marcel Heisler says: "Components of new batches/products only have to be taught-in once on a reference part, each additional component is automatically checked without the need to retrain. This will increase our efficiency many times over."

In terms of increasing efficiency through automation, Stepper has further plans with Alicona. The optional connection of the automation interface, to an existing CAD/CAM program, allows the integration of measurement technology in the design phase by defining a measurement series in the CAD data set of a component.

A simulation provides a preview of the measurement process to be carried out, providing reliable measurement planning and ensuring that the design allows measurement to be made.

The virtual operation of the Alicona measuring system covers the entire handling process, from the positioning of a component to

the determination of the measuring range in 3D. For Stepper, the advantage is obvious: Marcel Heisler says: "We expect a massive time saving. With the CAD/CAM connection, I no longer need the measuring system to teach-in my measurement series, this can be transferred to another workstation. This means that we will be able to use the measuring device 24 hours a day, seven days a week without interruption in production and fully utilise it."

With the implementation of measurement technology in production and design, Stepper is implementing its strategy of integrating the best technologies into its production with suitable partners.

Marcel Heisler confirms: "As a high-tech company, we are looking for partners who share our passion for precision. We found this in Alicona."

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SmartDENT 3D, a powerful aircraft surface inspection software

New surface damage analysis software combined with the HandySCAN 3D helps aerospace companies cut downtime and slash aircraft maintenance costs

Creaform, a leader in portable and highly accurate 3D measurement solutions, has announced the launch of its aircraft surface inspection software for non-destructive testing (NDT) designed especially for aerospace applications. The damage assessment software paired with the HandySCAN 3D scanner represents a safe, cost-effective and time-saving solution for airlines and maintenance, repair and overhaul (MRO) service companies.

Steeves Roy, NDT product manager at Creaform, says: "Following our operator-friendly design thinking and with deep consideration of user requests, we have developed a software that streamlines data processing from a 3D scanner for easy and reliable assessment and characterisation of surface defects on aircraft. As predictive maintenance becomes more prominent, aviation maintenance professionals and MRO providers are increasingly on the lookout for innovative methods that allow quicker and

safer decisions to be made on part defects outcome."

Unlike generic MRO software, SmartDENT 3D provides a guided workflow with an intuitive graphic interface to bridge the gap between data acquisition and report production. The software is designed to simplify measurement extraction of 3D scanning data to get exactly the dimensions required for in-service aircraft assessment. SmartDENT 3D eliminates the need for advanced knowledge in metrology software or otherwise complex 3D data handling. Users can feel confident about their results while saving time and money with no compromise on safety to return aircraft in service as fast as possible.

Creaform develops, manufactures, and sells 3D portable measurement technologies and specialises in engineering services. The company offers innovative solutions, such as 3D scanning, reverse engineering, quality control, non-destructive testing, product



development, and numerical simulation (FEA/CFD). Its products and services cater to a variety of industries, including automotive, aerospace, consumer products, heavy industries, healthcare, manufacturing, oil and gas, power generation, and research and education.

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Smart measuring technology from Klingelberg

The best of everything in one machine

Whether turning blanks, ground workpieces, circular blades, spacers for circular blades, or ball bearings, the new P 16 G precision measuring centre is purpose-designed, not to measure gear teeth, but rather specifically for use in manufacturing axially symmetrical components. It is the only machine in Klingelberg's P series to be equipped with software for dimension, form, and position measurement as standard. The software records diameter and cylindrical form/conicity, measures axial runout, evenness and angularity, and delivers a wealth of information for quality management, as required. Hence, with this precision measuring centre, there's no need for gauges. In terms of quality assurance, this universal solution for axially symmetrical components provides new opportunities to make a vital contribution to success, particularly in times of highly accelerated innovation cycles and growing requirements. Measuring and testing technology has become an essential pillar of smart production concepts.

Complete measurement of complex components

Accuracy requirements for gear measurements and, increasingly complex drive components, demand the best measuring technology available and a machine and software concept that is optimised for these applications. That's why leading manufacturers put their trust in Klingelberg precision measuring centres, which represent the most widely-used standard in the industry, while also serving as the reference for metrology institutes. Klingelberg precision measuring centres (P-series) are ideally suited to handle most measurement tasks in a wide range of sectors. They are used in the automotive and commercial vehicle industries as well as the aerospace and aeronautical engineering industries. This technology replaces up to four conventional measuring devices. This allows the following measurement tasks to be fully automated in a single setting: gear measurement, general coordinate measurement, form and position measurement, roughness measurement.

Stringent precision requirements in series production and increasing component complexity demands the best available measuring technology. The P 16 G is optimally designed for the production process, suitable for direct shop floor use and can be employed along the entire production chain. After each manufacturing step, every feature can be immediately displayed graphically or in table format, analysed, and statistically evaluated. This enables efficient process control and reliable management of production processes. The basic software also includes storage of statistical data for further evaluation, such as warning limit specifications, and the P 16 G is incredibly easy to operate.

Today Klingelberg operates engineering and manufacturing facilities in Zurich, Switzerland, Hueckeswagen and Ettlingen, Germany, and Győr, Hungary. The company maintains a global presence with sales and service offices in Italy, France, Spain, Russia, Japan, India, China, Brazil, the United States, and Mexico.

The company's declared aim is to continue to provide highly-efficient, competitive products for customers and partners from a range of industries, including the automotive, commercial vehicle and aircraft industries, shipbuilding, the wind-power industry, and general gear manufacturing. In all its dealings, Klingelberg is respectful of the environment. This is evidenced by



its ISO 14001 certification and participation in the Blue Competence Initiative by the German Engineering Federation (VDMA).

UK agent, Wright Manufacturing Services Ltd (WMS), established in 1983, has always focused on its core business of gear manufacturing related products and processes. The company operates as a machine tool agency, with sole representative agreements in the UK & Eire for some of Europe's premier equipment manufacturers, which includes many of the world leaders in both product technology and equipment in the respective fields of application. WMS is also continuing to grow to satisfy the requirements of its already extensive customer base. This continuous growth only reinforces its long-established position as a high-profile representative of the best European machine tool and equipment manufacturers offering all levels of support and service from a single source.

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Skids and probes for surface finish

By George Schuetz, director of precision gauges for Mahr Federal Inc.

The most commonly used, and perhaps the simplest measure of surface finish, is the Ra parameter, or roughness average. However, like ordering a coffee at one of today's deluxe cafes, it's not exactly simple. There are other things to consider to ensure the best results. For example, Ra can be measured with two types of contact gauges, which are distinguished by the nature of the probe or contact that traverses the part's surface. In "skidded" gauges, the sensitive, diamond-tipped contact, or stylus, is contained within a probe, which has a metal skid that rests on the workpiece. These skidded gauges use the workpiece itself as the reference surface. This is a relatively simple, inexpensive approach to surface measurement.

More complex skidless gauges use an internal precision surface as a reference. This enables skidless gauges to be used for the measurement of waviness and form parameters, in addition to surface roughness.

With skidded gauges, it is important to understand how the design of the skid itself may affect your measurements. Some probes have a simple button-like skid, which may be located in front of, or behind, the stylus. Others have a donut-shaped skid, with the stylus extending through the hole in the middle. In most applications, both types perform equally well, but occasionally, one or the other may be required to obtain accurate results.

Under high magnification, some workpieces appear to have wavy surfaces of very short wavelength; this is especially so of EDM parts. While the inclination may be to

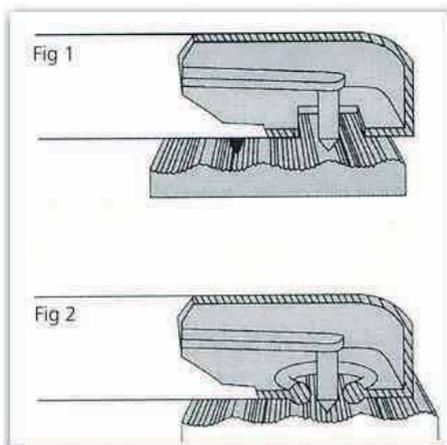
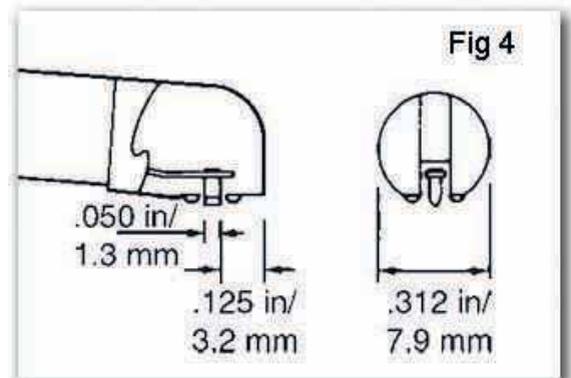
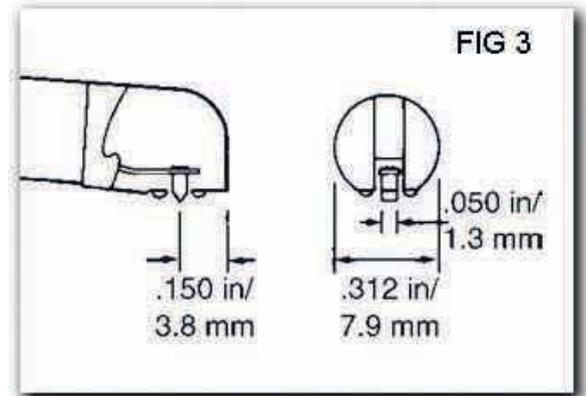
measure these surfaces using a waviness parameter, the pattern is really a tool mark, so a roughness parameter like Ra is better suited. But surfaces of this type can cause problems for gauges with button type skids which can "ride" the waves. As shown in Figure 1, if the distance between the skid and the contact is roughly half the wavelength of the surface waviness, then the skid and contact will trade places at the tops and bottoms of the waves as the probe traverses the surface. This has the effect of nearly doubling the vertical travel of the contact relative to the reference, which produces results that may be unreliable or non-repeatable.

The donut-type skid avoids this problem, because it remains at or near the tops of the waves as it traverses, as shown in Figure 2.

On the other hand, because probes with donut-type skids require substantial structure ahead of the stylus, they cannot reach certain features, such as surfaces next to shoulders. For this reason, there are a number of specifically designed probes to meet virtually every application.

It is also important to decide which probe to use, or more specifically, which radii for the diamond stylus that is used on the probe itself. Basically, there are three different radii that are commonly available today: $2\ \mu\text{m}/80\ \mu\text{m}$, $5\ \mu\text{m}/0.0002\text{ inch}$ or $10\ \mu\text{m}/0.0004\text{ inch}$, all on a 90° conical cone. In Europe and throughout much of the world, the $2\ \mu\text{m}/80\ \mu\text{m}$ probe is the most common. In the U.S., many applications call for the $5\ \mu\text{m}/0.0002\text{ inch}$ probe, although for rougher surfaces a $10\ \mu\text{m}/0.0004\text{ inch}$ probe may also be specified.

Probe radius is a big determinant of contact force. The smaller the radius of the probe, the lighter gauging force required. Too much probe force with a small radius probe can scratch the surface. For a $2\ \mu\text{m}/80\ \mu\text{m}$ probe, a $0.7\ \text{mN}$ force is typically used. For a $5\ \mu\text{m}/0.0002\text{ inch}$ or a



$10\ \mu\text{m}/0.0004\text{ inch}$ radius, a $15\ \text{mN}$ force is standard.

For gauging sharp edges such as knife/razor edges, or small ODs where the probe is aligned with the axis of traverse, in 180° , or closed position, a "chisel" probe is used, as shown in Figure 3. This incorporates a 90° sapphire chisel having a $10\ \mu\text{m}/0.0004\text{ inch}$ radius. The chisel is $1.3\ \text{mm}/0.050\text{ inch}$ wide to allow for easy alignment to the fine edge or small diameter being measured.

A similar stylus, Figure 4, uses the same chisel but is designed for probes that are being used perpendicular, either at 90° or 270° to the part.

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Major milling machine and cutter tool management centre order

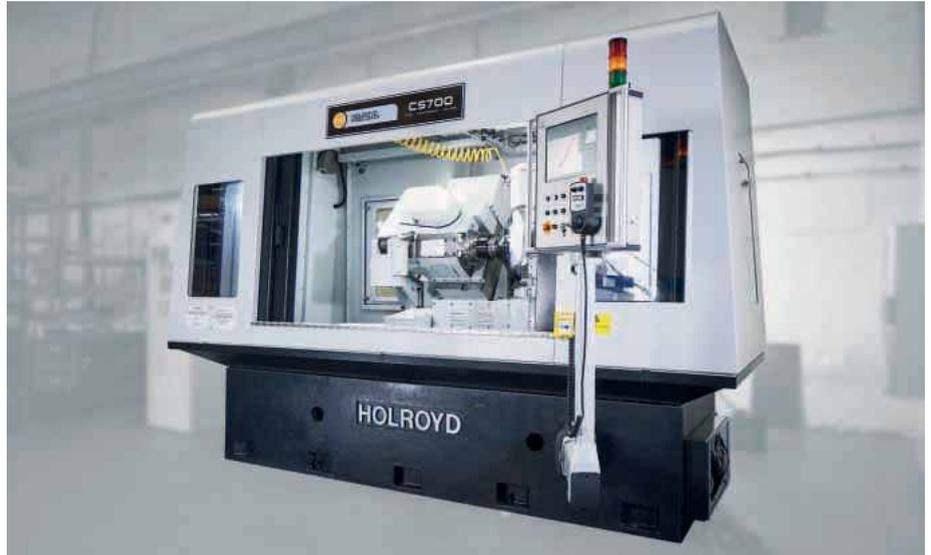
Only last year, a leading Chinese screw compressor specialist invested in a Holroyd Precision's industry leading Zenith 400 helical profile grinders. Now, just over 12 months later, the business has returned to Holroyd for an 8EX rotor milling machine and a CS700E tool management centre. Newly developed, the CS700E machines have been designed especially for the grinding of high accuracy profile forms on finish milling cutters of up to 700 mm in diameter. Scheduled for shipping in March 2019, the combined order is valued at several million pounds.

"Our EX Series rotor milling machines have earned global acclaim for their high speed, high levels of precision and unrivalled build quality.

"The 8EX model, as chosen by this customer, represents a new generation in high capacity rotor milling," comments Holroyd Precision's regional sales director, Steven Benn. "Offering precision milling of particularly deep helical profiles, it brings exciting opportunities to organisations that wish to machine highly accurate, large diameter compressor rotors. By also purchasing the CS700E, the customer will benefit from unprecedented control of the profile forms they use."

Delivering class-leading reliability and performance, Holroyd's 'standard' EX range of rotor milling machines begins with the 1EX, a machine capable of milling helical components of as little as 30 mm OD, offering stepped increases in capability, right up to the 8EX, an 850 mm OD rotor miller. A 'special order' 10EX machine is also available for components exceeding one metre OD. In addition, various bespoke EX models are offered. These include a recently introduced machine with a specially extended drum rotation for milling compressors for Roots-type (positive displacement lobe pump) superchargers, and the EX-HS Series – machines designed to operate at much higher speeds than standard models.

All Holroyd EX Series rotor milling machines are designed with the ability to maximise the high surface speeds demanded by the very latest cutting technologies. Surface speeds in excess of



The Holroyd CS700E tool management centre: newly developed for the grinding of high accuracy profile forms on finish milling cutters of up to 700 mm in diameter

200 m/min, for example, are often used when cutting rotor profile forms in a single pass, to leave only the allowance of 0.3mm stock for the finishing operation. EX-HS Series machines provide an even higher speed solution for machining profiles in aluminium supercharger or fuel cell rotors, the latter being developed extensively for hydrogen-powered electric vehicles.

EX machines cut a full-depth groove by traversing the cutting tool through the material at the relevant helix angle, while at the same time rotating the component in the C-axis. Accurate synchronisation between the axes is maintained via CNC, with digital drive technology controlling all axis movements. The cutting head is able to remove so much material in one step because the majority of heat generated is transferred to the swarf chips. These are then removed from inside the machine by means of a conveyor system.

Holroyd's newly developed CS700E tool management centre has been designed to grind high-accuracy profile forms on finish milling cutters of up to 700 mm in diameter. The machine provides a larger diameter alternative to Holroyd's highly successful CS500E (500 mm max. diameter) model that was introduced in 1990.

The CS700E tool management centre incorporates automatic dressing stations to ensure optimum integrity of the grinding

wheel at all times. The stations are equipped to condition CBN and diamond grinding wheels, while the use of HSK-A160 arbors (as fitted to 8EX rotor milling machines), enables rapid wheel changeover times and further enhances accuracy.

At the heart of the CS700E is Holroyd's user-friendly touch screen programming system, which provides complete control over production accuracies. Automatic scanning of the tool profile during the grinding cycle is another major benefit offered by the CS700E. Following probing, the tool profile is graphically superimposed over the theoretical profile and displayed within user-defined tolerance bands to ensure that all cutter blades are ground within tightly controlled limits.

Multi-bladed cutters can be sharpened on the Holroyd CS700E. The cutter indexing process is carried out automatically. The cutter is located on an HSK-A160 arbor for precise positioning on the 8EX rotor milling machine, or on other rotor millers employing the same arbor. The maximum profile height is 120 mm.

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Haas grinding centre for large components

Unveiled at GrindTec 2018, Haas Schleifmaschinen has introduced the new Multigrind® CB XL 5-axis CNC grinding machine for full-sequence machining of workpieces with a length of up to 3,200 mm. Features include: machine table over three meters long and extended axle travel range; high-precision grinding operation thanks to stable, symmetrical structure; extremely high power rating of 12, 30, and 50 kW; modular design: grinding machine or stand-alone production unit. The target market is tool manufacturers and the aerospace industry.



The Multigrind CB XL is designed for the full-sequence machining of large workpieces up to 3,200 mm in length

Designed for full-sequence machining of large workpieces, the grinding centre stands out thanks to its unparalleled precision and stability and comes in four models of different lengths to machine workpieces 1,400 to 3,200 mm long. In addition, the machine's modular design allows it to be equipped with different tool magazines and table extensions.

"For the past several years, we have witnessed a trend in the market toward machining larger workpieces in a single clamping. The advantage of machining large components from one piece is that it eliminates joints and, as a result, imprecision," says Thomas Bader, CEO of Haas. "Based on our flagship the Multigrind CB, we have developed a new high-tech grinding centre for these challenging grinding jobs with a machine table over three metres long. This has opened up to our customers completely new areas of application with Haas machines."

The new Multigrind CB XL is particularly suitable for manufacturers of large tools, such as hobs, racks, or gear cutting tools. In



The new Multigrind CB XL is particularly suitable for manufacturers of large tools and the aerospace industry

addition, the high-tech grinding centre is perfect for machining long, thin parts for the aerospace industry, like chassis parts for aircraft, turbine components, ball screws, and guide rails for machines.

Precision and stability

Haas' latest grinding center gets its stability and rigidity from an absolutely symmetrical structure: the grinding unit is always located in the centre of the machine, even in the event of thermal expansion. In addition, the axes are also symmetrically aligned and reduce undesired transitions or vibrations. The solid mineral composite base, multiple special rests to support the workpiece, as well as a high-accuracy Haas linear actuator in the machine table guarantee stable processes and repeatable grinding results. The machine table is safely enclosed, and four sliding doors make it easy to load, unload, and equip the machine.

Haas offers the Multigrind CB XL in four X-axis variations: Multigrind CB 1400, CB 2000, CB 2600, and CB 3200. As a result, it covers workpieces with lengths from 1,400 to 3,200 millimeters. The ability to machine larger components is possible thanks to the axes' long travel ranges (Z-axis: 500 mm; Y-axis: 410/850 mm; C-axis +70°/-250°).

The grinding and dressing spindles, also developed in-house by Haas, significantly impact the machine's power and precision. They are direct-drive, water-cooled, and perfect for grinding, milling, and drilling. A

new feature is the high spindle power rating of 50 kW at maximum speeds of 12,000 rotations per minute (HSK 80 E interface), which makes it possible to rapidly grind components without pre-machining.

A stand-alone grinding machine or with robot automation

Depending on the respective grinding job, the Multigrind CB XL can be operated either as a high-tech grinding machine or a stand-alone, unmanned production unit. Customers can choose from either an integrated standard magazine with up to 15 tools or a newly-developed, rack-type magazine with a gripper and space for up to 65 grinding wheels with diameters of 300 mm. To ensure the machine is being operated at full capacity, the grinding system can be used with a double-table system for grinding and simultaneously loading and unloading during grinding operation.



The Multigrind CB XL can be operated either as a high-tech grinding machine or a stand-alone, unmanned production unit

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Sharpening for mutual success

At GrindTec 2018, VOLLMER, the specialist in grinding and eroding machines demonstrated how it has successfully enhanced technologies and services for its sharpening and machine tools in close communication with customers and partners.

The Swabian expert showcased current innovations, including the new grinding machine CHX 840 for machining tooth faces and the top of circular saw blades in a single clamping process. Variants of the VGrind 360 tool grinding machine for manufacturing carbide tools was also on the stand, as well as the VPulse 500 wire erosion machine and the QXD 250 eroding machine for the machining of diamond tools.

VOLLMER also presented its current sharpening machines as well as automation solutions for machining tools and circular saw blades. The portfolio of the machine builder was also complemented by services related to training, financing, maintenance and repair. As a global partner of tool production as well as sharpening services, VOLLMER is represented worldwide with its local service teams and provides maintenance and repair of the machines.

HW circular saws: shortening the setup time

The CHX 840 grinding machine sharpens carbide-tipped circular saw blades with a diameter up to 840 mm. Thanks to a double grinding wheel, the machining of tooth face and top is optimised with a single clamping process, ensuring a significant reduction in setup time. In addition, the machine is adapted to the individual needs of the customer by different automation levels, thus ensuring further time savings. One option is the automatic setup procedure, which consists of saw insertion, diameter detection and acoustic sensor for touching. Automatic loading can be added, whereby an autonomy time of up to 7 hours is possible.

Carbide tools: sharpening around the clock

The VGrind 360, which VOLLMER designed for the development of carbide tools such as drills, milling cutters or reamers is available in two versions: one with two vertical spindles for grinding wheel packages and the other with one grinding wheel spindle



The Vgrind 360 with automatic change of coolant nozzles included as well as grinding wheel sets for both spindles

and one high-frequency spindle (HF spindle), plus an automatic tool changer. The high-frequency spindle allows the grinding of special pocket seats for PCD plates. One of VOLLMER's latest solutions, the HC 4, is a compact machine that comprises a chain magazine with 39 spaces for standardised HSK 63-A (hollow shank tapers) or it can also optionally hold up to 158 shank workpieces.

For the first time, VOLLMER showed an optional roughing unit for the VGrind 360 in Augsburg. It enables the automatic opening of the abrasive coating, i.e. the removal of grinding residues on the diamond-tipped grinding wheel. This process helps maintain the sharpness of the grinding wheel for longer. It is now also possible to automatically change the grinding wheel sets and their coolant nozzles on the VGrind 360. Thanks to this option for both spindles, tool manufacturers can reduce the setup times and use the VGrind 360 even more efficiently for production.

Diamond tools: precise machining

VOLLMER's faithful QWD series is now making way for the new VPulse 500 wire erosion machine for the machining of PCD tools. With a new erosion generator and advanced technology, it can produce large batches of high-quality PCD tools. Modern



The new optional roughing unit for the Vgrind 360 enables automatic opening of the abrasive coating during production

machine kinematics ensure high profile accuracy in both production and maintenance. With the VPulse 500 operating concept, the touch-screen allows you to easily programme and control the tool for quick, error-free work.

The QXD 250-disc erosion machine can also be used to precisely machine a variety of PCD tools. Added programme functionality means that tool manufacturers can use the current QXD 250 to speed up their sharpening processes. With the HC 5 pallet circulation magazine, the erosion machine can be expanded by up to 28 workpiece positions. At GrindTec, VOLLMER also presented new software updates and available software options to increase process reliability, precision and flexibility.

Circular saws: sharpening around the clock

In the sector of circular saw machining, visitors could obtain information from VOLLMER on another four innovative machines: the CC 355 production line for complete sharpening of circular saws for cutting wood, including all tooth faces, tooth tops and side angles in a single working cycle. With the VOLLMER CHD 270, the entire grinding unit is robustly mounted on a central main structure, forming a

compact assembly. This monoblock construction ensures the precise and smooth sharpening process for carbide tipped circular saw blades. Together with an ND 230 handling system and corresponding loading carriage for automatic loading, the machine can operate around the clock. VOLLMER presented the sharpening machines for the carbide-tipped circular saws CHP 840 and CHF 840 with a multifunction hand-wheel for intuitive machine operation.

VOLLMER subsidiary Loroch, was also represented at GrindTec. Loroch showed its product portfolio of automatic saw blade sharpening machines, including the CNBS 100 band saw sharpening machine as well as the PowerStar 850 CNC-controlled sharpening machine.

With its comprehensive range of machinery, the VOLLMER Group, which has sites in Germany, Austria, Great Britain, France, Italy, Poland, Spain, Sweden, the USA, Brazil, Japan, China, South Korea, India and Russia, enjoys global success as a tool machining specialist in terms of both production and service. The technological leader's range of products contains the most advanced grinding, eroding and machine tools for rotary tools, circular saws and band saws in the wood- and metalworking industries. In offering this, VOLLMER relies heavily on tradition and the company's strengths: Local branches, quick decisions and rapid action by a family-run company.

The VOLLMER Group currently employs approximately 750 workers worldwide, with around 550 of these at the main headquarters in Biberach alone, including more than 50 trainees. The company invests around eight to ten percent of its turnover in the research and development of new technologies and products.



The QXD Disc erosion machine for PCD tipped tools

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ANCA helps Indian toolmaker increase productivity by 30 percent

Aayudh Tools, based in Aurangabad, India, achieves high accuracy and repeatability and a web centrality controlled within 10 microns

Situated at the manufacturing hub of western India Aurangabad in Maharashtra, Aayudh Tools has been engaged in cutting tool manufacturing since 1990. Driven by a passionate and experienced professional Hemant Dadhe, the company has carved a niche for itself in the competitive Indian cutting tool market with its tailor-made solutions and highly reliable tools.

After working with companies like TATA Motors (then TELCO) and Sandvik, Hemant Dadhe started Aayudh Tools with a vision to become the most trusted cutting tool supplier in the domestic market.

"We started manufacturing HSS tools in 1990. From 1995 onwards, the group progressed further by manufacturing brazed carbide cutting tools. In 2003, we started manufacturing solid carbide cutting tools to cater to the growing needs of the manufacturing industry," says Hemant Dadhe, founder and director of Aayudh Tools.

Indian manufacturing industry was scaling new heights and witnessed huge demand from automotive and infrastructure sectors. It also prompted several global OEMs to set shop in India. As the FDI was increasing in the country, the demand for high precision tools was also in constant demand.



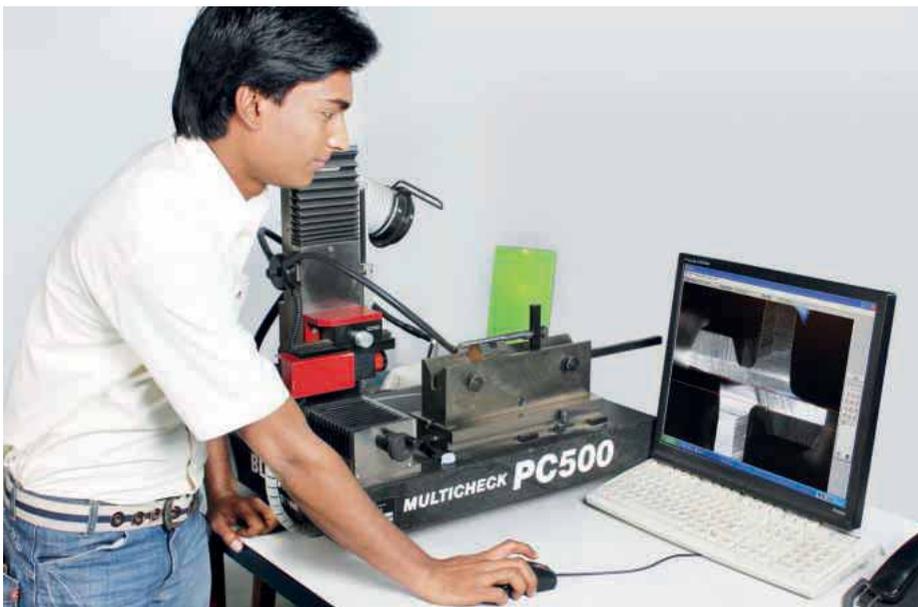
"During 2009-10, we were catering to some global automotive OEMs and their expectations from the cutting tool supplier were very high. We wanted to give our best, but finding the right machine was increasingly becoming a challenge. There was a requirement for a machine that could provide us high repeatability and micron level accuracy, which our then setup was not able to meet. That is when we came across ANCA and made our first ANCA Purchase, the TX7 high-end CNC grinding machine," adds Hemant Dadhe.

"ANCA helped us to achieve the much-needed web-centrality. It means at the centre point of the tool there is a kind of web which is maintained at about 0.1 mm. The centrality of that web compared to the X and Y-axis needs to be controlled within 10 microns. When it's controlled at the said parameter, the performance of the tool improves. This was something we were not able to achieve earlier. ANCA was able to deliver us the perfect geometry."

One of the most important aspects when it comes to cutting tool business is repeatability of the performance, i.e. the first tool and the last tool should have the same kind of accuracy, with exactly the same geometries.

"It might seem there is hardly any difference between the finish of mid-range machine and high-end machine, but the difference can be seen in the micron level. ANCA machines helped us to achieve high accuracy and repeatability. The minute difference in the geometries improves the life and reliability of the tool and reliability, which is very important for us," he adds.

Aayudh Tools boasts about 350 customers and manufactures tools as per the customer's demand. The company has developed over 40,000 varieties of tools to date and the long list of happy customers includes large domestic and foreign automotive OEMs.





Hemant Dahde adds: "As the Government of India has taken several initiatives to promote electric vehicles, we are aware that there will be a significant drop in the demand for machining activities in the automotive industry. At the same time, we see great opportunity for the mould and die and aerospace industries in the country and we are prepared to face the change in demand."

Backed by technologies from ANCA, Aayudh Tools is well-equipped to meet these challenges.

"Since 2011, the market was stagnant and there were too many players. This made us focus on the development of new tools and geometries and invest in the right technologies. ANCA has helped us stay ahead of the competition," concludes Hemant Dahde.

With the help of ANCA's MX5 and TX7, Aayudh Tools has increased productivity by about 30 percent and is looking to enter new and challenging sectors like aerospace.

"The software team at ANCA is very experienced and has always helped us in design activities. Their open-ended software is helpful in designing new tools especially for companies like us who make only customised tools. Our suggestions were

also implemented in the next version. We couldn't be happier," adds Hemant Dahde.

The ANCA control system is also equipped with a CAM feature, which can be used to export data into Unigraphics. It helps to make the necessary changes in the design of the tools. ANCA is also trying to develop post processor that will allow 3D model geometry to create CAM programme in the machine itself.

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New from the ground up

Walter Helitronic grinding/eroding machine now also for tools up to 380 mm long

Two new multi-axis Walter Helitronic tool grinding/eroding machines for processing long tools have been announced by Walter Ewag UK, a member of the United Grinding Group, and shown for the first time at GrindTec.

Both the Power 400 grinder and the two-in-one Power Diamond 400 grinding-eroding machine for the production of carbide as well as PCD tooling have extended traverses to enable tools up to 380 mm long to be processed: an increase of more than 35 percent compared to the previous limit of 280 mm.

The new machines also offer more than just longer workpiece lengths. Both have been completely redesigned in line with the Walter Vision models and feature, for example, a very rigid bed to ensure improved damping characteristics, which in turn facilitates greater precision and higher surface quality.

In addition, the machines' C-axis (on standard versions) is driven by a worm drive and a low-maintenance, extremely accurate torque motor is an option.

Walter engineers have also replicated the Vision machines' pneumatically-driven steady rests and tailstocks, devices that are less prone to leaks, require less maintenance and are much cleaner. They also absorb less heat than components that use hydraulic oil, thus ensuring even greater precision.

In addition to having a grinding wheel/electrode changer, for increased automation and unmanned operation both new machines can utilise a Top Loader for up to 500 tools, a Robot Loader for up to 7,500 tools or a Robot Loader 25 which has a capacity for 25 kg including grippers.

The new machines incorporate the Helitronic Tool Studio grinding and eroding software with integrated wizard technology for fast tool production simulation, parameter changes and machine operation. The latest Version Three of the software includes an erosion function for the fast and easy programming of 'what you see you can grind and erode'.

The new erosion functionality allows: the design and programming of complex tool geometries, including individual tooth geometries and tool parameter scaling; fast 3D live simulation routines; automatic



collision control. The system offers a simulation mode where parameters can be quickly and easily changed before tool production starts. Tool Studio 3 also has a grinding wheel data interface for the Heliset tool measuring machine, to measure wheel/wheelsets then send/import that data to Tool Studio.

Like all of Walter's two-in-one grinding-eroding machines, the new Helitronic Power Diamond 400 uses Fine Pulse Technology, a Walter innovation that sets new standards in terms of PCD tool surface and cutting-edge quality, as well as process reliability.

Fine Pulse Technology is the result of progressive improvements to the machines' generator as well as the erosion software.

Marked differences to PCD tools of 10

microns grain type that have been eroded by other machines can be seen with the naked eye: the surface finish is like that of a polished (ground) tool and even coarse-grained PCD types can be fine-finished with perfect surface qualities.

With such super-fine finishes achievable with Fine Pulse Technology, PCD tool providers can achieve superb levels of tool surface quality and cutting edge within similar processing times as before. Also, subsequent steps in production can even be eliminated because no re-sharpening or polishing is required.

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NUM Flexium+ CNC maximises productivity

Ultra-precise CNC system facilitates exceptionally accurate grinding of small machine tools

NUM's latest-generation CNC systems are helping US manufacturer Star Cutter Company to maintain its position as a world leader in cutting tool machines. Star Cutter's new 5-axis tool and cutter grinding machine, the NTG 6RL, is based entirely on NUM's Flexium+ CNC platform and fully automates the high-speed production and reconditioning of complex cutting tools.

Star Cutter Company specialises in carbide and preform manufacturing, cutting tools and CNC machines for tool/cutter grinding and hob sharpening. Founded in Detroit back in 1927, the company nowadays operates six manufacturing facilities at strategic locations throughout Michigan.

Since 1998, Star Cutter has partnered with NUM for cooperative development of application-specific CNC hardware and software. During this nearly 20-year collaboration, the two companies have advanced cutting tool machine technology significantly. Star Cutter currently manufactures seven highly specialised lines of machine tools, six of which are based on NUM's CNC systems.

Star Cutter originally used FANUC controllers for its machines. However, with a goal to bring its customers even more capability and ease in realising complex tool forms, as well as to gain more flexibility and speed in integration of third-party motors and simplify the development of control software, the company sought to transition from a proprietary control scheme to a more open CNC platform.

Bradley Lawton, chairman of Star Cutter Company, says: "NUM was an obvious choice. The company is renowned for the open architecture nature of its CNC solutions, and has done much to remove the 'black box' mystique that is endemic to many of the competitive CNC products on the market. The quality and reliability of NUM's products is excellent, which is extremely important to us. Over 99 percent of the machines that we have produced in the past 20 years are still in everyday use. On top of that, NUM's customer support is superb and we enjoy very responsive and helpful technical help".

NUM and Star Cutter's partnership has created dividends for both companies, and



for their customers and machine end-users. Starting with its ETG and PTG series of tool and cutter grinders, which now have an installed base of more than 200, Star Cutter has steadily migrated nearly all of its CNC machines across to NUM's CNC hardware and NUMROTOplus software.

Star Cutter's latest NTG 6RL full linear 5-axis tool and cutter grinder machine can handle fluting, tertiary grinding, relief grinding and automated wheel change. It is based entirely on NUM's powerful Flexium+ CNC platform. The NUMDrive X modules that form part of this high-end CNC solution provide the drive flexibility that is needed to accommodate a variety of third-party linear and direct drive torque motors, as well as high frequency grinding spindle motors. As a consequence, the machines are capable of very high grinding and surface finish accuracies, combined with unprecedented grinding speeds, and promise to be the most productive that Star Cutter has ever produced.

Another key attribute of the Flexium+ platform is that it can run grinding programs as large as 40 MB directly from the NCK memory. Also, for very complex grinding cycles, the CNC system can execute cycles directly from the system's disk drive, via a high speed data transfer protocol. This increased capacity and speed helps Star

Cutter's customers to expand their CAD/CAM grinding operations. Application areas include the processing of advanced materials and aerospace components, in addition to medical devices and tools.

Star Cutter's new grinding machine also features a novel servo-assisted popup mechanical steady rest. This makes full use of the 'detachable axes' facility of Flexium+ systems equipped with NUMDrive X modules. It enables end-users to simply place the rest into the machine for the production of longer parts and to quickly remove the full motor/mechanical assembly when it is not needed.

Focusing on an intuitive user experience, the operator station features an entirely new design which reduces button pushing, significantly simplifying machine setups and daily operations. The optional 6-axis robotic part loader essentially programs itself from the NUMroto tool files, requiring minimal user inputs. Notifications can be set to alert shop personnel of process completion or of issues encountered during unattended production.

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New professional GTL grinding oils combine impressive performance characteristics with innovation and safety

Lubricant manufacturer Rhenus Lub has introduced rhenus EHM 12 and rhenus EU 12, two new grinding oils based on future-proof GTL technology. These new oils fulfil all requirements and look set to become the preferred lubricants in modern manufacturing facilities in the long-term.

The new products are particularly suitable for demanding processes such as grinding hard metals, gearing components and tools. It offers an effective combination of performance, innovation, and safety. With excellent process stability, high lubrication performance and optimised foaming behaviour, the new professional GTL oils from Rhenus Lub offer an ideal alternative to traditional products based on mineral oils, hydrocracked oils and polyalphaolefins (PAOs). The aromatic-free GTL base oil means these oils are also highly recommended from a health perspective.

Switching to the professional GTL oils is easy with the Rhenus Lub conversion service. The lubricant manufacturer keeps the process stable during replacement and enables a simple, no-risk changeover.

A powerful complete package

The professional GTL oils, rhenus EHM 12 and rhenus EU 12, will take customers' manufacturing to a new level. Users will not only benefit from optimised process costs compared to conventional comparator products, thanks to a symbiosis of the new GTL technology and an intelligent additive combination, they are also able to improve performance in the long-term.

One crucial factor for this is the special formulation used in the new rhenus products and its properties. The rhenus professional GTL oils have an extremely high flash point of over 200°C and favourable anti-fog properties, thereby increasing operational safety and eliminating the risk of fire. They have excellent separation and enable greater, more effective cooling of the workpiece, while machinery remains clean thanks to excellent rinsing behaviour. The extremely low evaporation loss of the new products leads to reduced consumption,



which in turn has a positive impact on costs. At the same time, the excellent foaming properties help to reduce wear on machining tools. Users can enjoy a considerably prolonged tool service life and additional cost savings.

Conversion service for a smooth switchover

The conversion service helps eliminate risk for customers switching to the professional GTL oils by providing support from the experts at Rhenus Lub. This service ensures the required level of safety during process adjustments, as Meinhard Kiehl, director of marketing for product management at Rhenus Lub, explains: "We have close links with industry and understand that companies need simplicity and safety in their manufacturing processes more than ever. If the process has run with stability once, operators are often unwilling to change. As a result, they may be using oils for which the new and powerful professional GTL oils would be a preferable alternative."

As a process expert, Rhenus Lub provides consultancy support for the switchover to GTL technology.

Meinhard Kiehl adds: "We work closely alongside customers during their switchover

to our modern GTL products, thereby ensuring that there are no risks to our customers' production process throughout."

rhenus professional GTL oils set new standards in health and safety

In addition to cost savings and improved process reliability, the professional GTL oils are also setting new standards in environmental, fire, and health protection.



For Daniele Kleinmann, product manager for Coolants at Rhenus Lub, this is a particularly defining feature.

Daniele Kleinmann says: "For employers, it is more important than ever today, and in the future, to not only uphold their duty of care towards employees, but to also actively protect the health of machine operators. Our rhenus EHM 12 and rhenus EU 12 professional GTL oils therefore not only features impressive lubrication performance and excellent foaming characteristics, but also offer optimised health and safety protection. Their low volatility and evaporation rate mean that less oil vapours end up in the lungs of the machine operator, while the higher flashpoint also increases operational safety. As the professional GTL oils are free from aromatics, heavy metals, and any zinc or chlorine compounds, the risk of skin diseases is also reduced."

Innovative process for future-proof products

GTL oils are produced from a chemical process in which natural gas is converted into a synthetic and therefore particularly pure oil. The absence of mineral oil makes the new professional GTL oils from Rhenus

Lub especially future-proof. In addition to the grinding oils rhenus EHM 12 and rhenus EU 12 that are already available, Rhenus Lub is currently developing additional products based on the innovative GTL technology. Rhenus Lub is an international system provider of special lubricants, application support and process solutions for metal working and metal processing.

The company, which was founded in Mönchengladbach, Germany, in 1882, develops and manufactures water-miscible coolants and neat oils for demanding machining applications, special products for forming operations, special greases and special oils. Its customers include leading companies in the mechanical engineering industry, the automotive and automotive supply industries, as well as in the roller bearing, food and aerospace industries.

As an innovation leader, Rhenus Lub invests an above-average amount in



research and development, with over 20 percent of all employees working in this area. Through its subsidiary companies and other representative partners abroad, Rhenus Lub has a presence in 31 countries around the world.

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Sustainability in tool grinding - clean oil means cost savings

Optimally cleaned lubricants play a decisive role in tool grinding, since chips, wheel abrasion and other particles can negatively impact the grinding process. Capable and energy-efficient filtration is becoming more and more important, especially when considering today's tightly defined tolerances for tools and micro tools in particular. Excellent filtration can also save money by extending coolant life and reducing non-productive time, which cuts the cost of purchasing, storage, recycling and energy consumption.

Clean coolant in carbide and HSS tool grinding is important in creating a safe work environment and is partly responsible for the quality of the end product. VOMAT GmbH from Germany provides fine filtration systems that separate dirty and clean oil 100 percent with full flow filtration process. The filter throughput and backwash cycles are automatically adjusted as needed. This extends the life of the filter elements and saves energy and costs.

Save money while filtering

Steffen Strobel, technical sales manager at VOMAT, states: "Many filtration systems on the market filter permanently at full capacity, even if this is not necessary. In contrast, VOMAT systems adapt to the production process. For example, if grinding machines operate slowly, only the required amount of cooling lubricant is filtered."

Another example is when a VOMAT system filters coolant from several grinding machines. If some grinders are not in operation, the filter capacity of the VOMAT machine automatically adapts to the production volume. At the same time, less heat is transferred to the coolant, which in turn reduces the need for cooling. This ultimately minimises the energy expenditure.

On-demand back-flushing

With full-flow filtration, VOMAT filtration systems permanently provide clean oil meeting NAS 7 quality (3-5 µm). The on-demand back-flushing system offers further benefits: the filter and machine components are less stressed and in turn the energy consumption is reduced. According to VOMAT, conventional systems operating in bypass mode do not produce any clean oil during the back-flushing cycle and, as a result, dirty oil will remain circulating in the system. On VOMAT filtration systems, the backwash cycles are controlled by the degree of filter cartridge contamination. Once those levels are reached, the back-flushing process begins by cleaning each filter cartridge individually. The filters which are not being back-flushed remain in service to ensure a continuous supply of clean oil. In the disposal unit, the back-flushed oil is separated from most of the sludge and conveyed into the dirty oil tank. As a result, VOMAT claims the service life of each individual filter element increases significantly and the coolant can remain in the system for longer periods of time while saving energy at the same time.

Steffen Strobel says: "The decision to use an efficient and energy-efficient filtration system will affect the production costs directly. VOMAT has developed this innovative technology to optimally adapt to any production situation through on-demand filtering and back-flushing which automatically minimises energy consumption. Altogether this can save a lot of production costs."



While in full-flow filtration, VOMAT filtration systems permanently provide clean oil in NAS 7 quality. On-demand filtration and back-flushing reduce stress on filter and machine components while reducing energy consumption

Why VOMAT filtration systems?

There is no blockage of the cartridges when water, slideway or hydraulic oils are getting into the filtration systems. Prevention of break downs via Remote Control via the internet prevents breakdowns and production stops. Filtered particles > 3µm, usable with oils up to 15 cSt, 104°F and no back flushing with compressed air. There is a one-year warranty on the filter cartridges and very low maintenance costs on spare parts and easy exchange of the filter cartridges.

Originally established by parent company Oelheld GMBH in 1998 to provide high quality EDM oil and grinding fluids to the UK manufacturing base, Oelheld UK has expanded its product range to include filtration systems and the associated consumable products. Its complete portfolio has one common goal: to enhance the performance of its customer's capital investments by reducing down time, reducing consumable costs and increasing the amount of hours that are available for productive manufacturing.

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Cooling lubricants

Cooling lubricants are used in most applications in metalworking. This type of lubricant must perform a lubricating and cooling function at the same time. Moreover, the fluid is supposed to remove the metal shavings created during the process. These lubricants must possess particularly strong corrosion protection characteristics to prevent contamination of the processed parts, tools and machine surfaces. Furthermore, the cooling lubricants need to contain special additives that prevent excess wear and tear on the tool or premature tool damage. Chemische Werke Kluthe GmbH is a specialist manufacturer and supplier of cooling lubricants and products for the cleaning of metal components.

Kluthe cooling lubricants are divided into two major groups:

Water miscible:

HAKUFORM A – water miscible, mineral oil-containing cooling lubricants: emulsions for machining and forming

HAKUFLUID – water soluble, mineral oil-free, fully synthetic cooling lubricants: clear solutions for metal cutting

Non-water miscible:

HAKUFORM L – non-water miscible cooling lubricants i.e. cutting oil, drawing oil and grinding oil: for machining and forming



The HAKUFORM A water-miscible series of cooling lubricants are free of plant-based oils that tend to become resinous and do not contain any volatile or odour-intensive amines. They are mainly boron-free and meet all TRGS 611 requirements. HAKUFORM A cooling lubricants are characterised by their superior pH and bio stability as well as their proper corrosion protection properties. The emulsions in these cooling lubricants can achieve very long tool life. The separate addition of corrective chemicals such as biocides is usually unnecessary.

HAKUFLUID cooling lubricants are water-based boron, formaldehyde and oil-free metalworking fluids. They combine the advantages of non-water miscible processing materials with those of water-miscible processing materials, thus providing optimal cooling and lubrication. Thanks to the characteristics of HAKUFLUID cooling lubricant, personnel and the environment around the processing machines are not negatively impacted by oil vapour and oil mist.

When switching from emulsion to HAKUFLUID, the quantity consumed can be reduced by up to 30 percent. When switching from processing oil to HAKUFLUID, consumption can be reduced by up to 90 percent.

HAKUFLUID is suitable for various processing operations and is successfully used in many different industrial sectors.

HAKUFORM L non-water miscible cooling lubricants contain natural gas-derived base fluids (GTL oils). Due to this, the lubricants produce exceptionally low vaporisation and fogging as well as very high flash points. In

addition, HAKUFORM L oils contain special additive combinations which will yield long tool life.

In addition, the Kluthe product range also includes other water-miscible and non-water miscible cooling lubricants for forming processes, including the production of beverage cans. Volatile stamping oils, minimum quantity cooling lubricants, cold extrusion and drawing oils are also represented.

Meanwhile, the CUSTOS series of emulsifiable corrosion protection oils are usually processed in a 5-15 percent emulsion at 50-60° C in a spraying process. Metal components can be cleaned and simultaneously protected against corrosion in one step. The immediately applicable corrosion protection emulsions are free of organic solvents and are applied in an immersion or spraying process. After the emulsion has dried, a protective film will remain on the component, which protects the treated metal surfaces against corrosion for up to 12 months.

Founded in 1950 in Heidelberg, Germany, Chemische Werke Kluthe GmbH operates under the banner "Harmony in Chemistry." With an annual turnover of 220 million euros, the company operates from 14 production sites and has 600 employees. It has 15,000 customers and has 30 licensed partners and sales offices worldwide.

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Safer cleaning choices replace nPB for solvent cleaning

By Mike Jones, vice president of MicroCare Corp

Engineers are always looking for alternatives to chemicals that might have health concerns or cause environmental damage. Regulations and guidelines can be bewildering, especially with the laws continually changing and redefining the choices companies can and can't use.

With this in mind, choices on cleaning fluids can be very limited and this lack of choice sometimes leads engineers towards using the same product even if it is fraught with potential problems. This situation is apparent with companies who are using aerosol cleaners packaged with a chemical called normal propyl bromide (nPB). These products are highly-effective precision cleaners with very attractive prices. However, the toxicity standards for these products are being tightened and their use will become problematic.

nPB up close

Normal propyl bromide is a nonflammable organic solvent based on the element bromine. It is often used as a replacement for methylene chloride, perchloroethane ("perc") and trichloroethylene. Bromine is



As a solvent, nPB is a powerful degreaser that removes oil and grime quickly. Notice the over-spray from the high-pressure aerosol; this increases worker exposures

used in a wide variety of industrial applications such as fire retardants, water purification, pesticides and drugs, as well as sedatives and antihistamines.

A subset of the bromine product range is 'n-propyl bromide' found in the solvent version of bromine. To determine if you are using nPB, examine the aerosol can or on the safety data sheet. Specifically, look for an ingredient with the Chemical Abstract Number (CAS #) 106-94-5.

Due to a lack of clinical toxicology studies, the original toxicity level for nPB was thought to be around 100 ppm, but the solvent was rarely used because other alternatives were available. After the completion of preliminary exposure studies in 2004, the toxicity rating of nPB was lowered to 25, which is low but manageable. Proper storage and handling, along with protective equipment, can manage the risks of short-term overexposure.

Later, toxicology studies found that nPB seriously damaged the nervous system and in 2004 n-propyl bromide was found to alter human DNA and have harmful effects on fertility. Based on these reports, The European Chemicals Agency (ECHA) listed nPB as a 'substance of very high concern' in December 2012. To this effect, REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) can place a complete ban in the future on any products containing the substance.

In short, while nPB has been an acceptable choice for precision cleaning in tightly sealed cleaning systems for years, the use of nPB in aerosols is still proposed to be unacceptable, but a final ruling has not been published. This means the chemical can still legally be packaged within an aerosol.

MicroCare does not package nPB into aerosol canisters. It is almost impossible to use any fluid in an aerosol package and keep exposures below 10 ppm. Testing at MicroCare years ago determined that, under the best of circumstances, exposures for workers using aerosol cans are in the 10-20 ppm and one could expect uncontrolled, high-pressure aerosols to generate substantially higher exposures.



Here the operator cleans a similar gear to excellent results using an HFC-based formulation with a much safer toxicity rating

But here's the key questions: Are the intended replacements for nPB up to the job? Can customers stop using nPB and switch to newer and safer cleaning products? For that answer, a simple field test seems well-justified.

Field tests

The criteria for which customers should be searching is clear and all-encompassing, a nonflammable, fast-drying, highly aggressive solvent that cleans well, doesn't damage the environment and has acceptable toxicity ratings.

Most companies using aerosol degreasers use a simple 'visual inspection' to confirm the parts are clean enough. Conversations with operators confirm they are looking for fast, safe, convenient "good enough" cleaning. A suitable location to test cleaning results was at a local auto transmission repair shop, that opened its workshop to cleaners and photographers from MicroCare.

Auto parts heavily contaminated with dirty lubricating oils can be considered typical of the industrial cleaning applications found in almost every factory around the

world. Gears, levers, push-rods, conveyor systems and actuators of all sorts become covered in dirt, dust and debris over time, and these must be cleaned before repair.

In this real-world field test, a wide variety of transmission parts were cleaned with two different nPB aerosol cleaners and one HFC-based aerosol cleaner. Cleaning was enhanced by scrubbing the parts with a stiff brush. Operators judged the cleaning effectiveness to be very good on all three products, even when the residues were baked into place. When the parts were placed side-by-side after cleaning, operators could not detect a difference between the parts cleaned with nPB and the parts cleaned with HFC-trans blends.

Both types of chemistry are definitely not 'plastic-safe'. As a side-by-side test of their cleaning strength, the sprays were aimed at a soft plastic foam product. Both destroyed the foam instantly. This suggests that in terms of cleaning strength the materials operate in a highly similar manner.

Operators observed a few interesting differences. The nPB-filled aerosols were packaged at higher pressures than the HFC-based cleaner, so those cleaning fluids came out faster and with more 'scrubbing' power. This obviously is a function of the packaging and not the cleaners themselves.

The operators also commented on how the HFC-based cleaner evaporated faster than the nPB-based cleaners. Since nPB boils at 70°C, about 40°C higher than HFC blends, it should evaporate more slowly. This observation caused some divergent opinions. One operator thought fast-drying was convenient and allowed him to work



The air quality monitoring badge



There are a wide variety of cleaning options on the market today that don't require compromise or sacrifice of safety

more efficiently. The other operator felt he used more solvent, because it evaporated so quickly.

Both operators noticed the HFC-based cleaner had far less aroma than the nPB-based cleaners and both felt this was a significant improvement. Nobody, it seems, likes malodorous chemicals even when they work really well.

MicroCare provides air monitoring badges to clients using nPB purchased from MicroCare, so during the tests one tech wore a badge. This unobtrusive device 'sniffs' the air and provides insights into the environment surrounding the operator. After cleaning, the badge was sealed and sent to the lab for testing.

Results indicated that the operator had been exposed to approximately 20 ppm of nPB during the two-hour test session. This suggests the exposures from even this simple test put operators over the latest exposure limits and puts employers using nPB at substantial liability. Savvy companies will use the badges to make changes in processes, like better training, better ventilation, or other steps, if worker exposures change.

Making the right choice

Many industrial customers need a strong, nonflammable aerosol degreaser. However, it is clear there is no longer a need to use nPB-based aerosols. While these tests were not rigorously scientific and were conducted with a very small sample, these admittedly anecdotal conclusions strongly suggest that today there are viable choices on the market that are substantially safer than nPB.

It seems reasonable that any well-informed company buying aerosols containing nPB should be looking to change as soon as possible. Furthermore, any distributor selling aerosols filled with nPB aerosol should be concerned about product liability. Everybody should be helping their operators select and procure a newer, safer cleaning fluid.

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Not all that glitters is gold - sometimes it's oil

Moving a business into new premises to promote and demonstrate a solvent-based parts cleaning system is not a simple decision or process. However, continuously developing customer experiences in order to set Kumi Solutions apart from its competitors has always been a motivation. Its showroom in the UK is the first to feature multiple machines and solvents, the first OEM supported UK spares, and the first OEM trained, supported and approved service capability based in the UK.

To improve customer experience and create space for additional staff for its growth plans, a move into new premises was the next logical step.

Kumi director, Jeni Graham says: "Building on the previous setup of a high-quality, private demonstration facility, where customers can see and clean their parts in advanced parts cleaning systems from Pero Germany, Kumi Solutions set out to include new and essential experiences that help customers make sound decisions about the future of parts cleaning within their businesses".

The remit for the new building was to introduce customers to three core services that help control the final quality of products, the consistency of results and optimising the process for easy maintenance and potential cost reductions to controls.

New to Kumi Solutions, are engineered fluids from Oest, a 350 million Euro turnover business, that has optimised its oils to give maximum benefits at the cutting/forming stages of production and, as importantly, at the cleaning stage of production while at the same time being more environmentally and people friendly. Simon Graham, director of Kumi, says: "Most oil producers largely ignored the vital production step of cleaning. Oest recognised, some years back as the REACH process was developing a



head of steam, many chemical registrations would not take place due to the low industry volumes used and the high cost of registration. Using optimised chemistry eliminates the challenges faced by elevated temperatures and low pressures found in modern solvent degreasing equipment".

With foresight, Pero realised that cleaning systems must become significantly more efficient and incorporate far better automation to meet ever more demanding production needs of the modern business. So in 1978, while the UK continued to embrace open top style degreasers, Pero invented and produced the first horizontally loaded sealed solvent degreasing system on the market, the 2500-series machine. Moreover, with that single design step, Pero reduced average solvent consumption down from eight metric tonnes per year, as seen with open top technology, to 300 kg per annum. In the following 30 years of Pero expertise, know-how and significant investment into R&D, the current class-leading R-series machines solvent consumption has fallen to less than 50 litres a year for most users, even 24/7 operations. Most of this is accounted for in the waste via another Pero award-winning development from 1985, the integrated distillation system.

In creating the new showroom, Kumi Solutions enables customers to experience operating the Pero R-series technology, along with SAFECHEM's Dowclene 1601 or DOWPER MC solvents to prove both

perform to required standards with their parts. Customers gain real insight into the tangible benefits of the cleaning processes, such as high product throughput with parts loaded, washed, dried and unloaded in as little as three minutes. Even long washing cycles involving ultrasonic cleaning, rotation and multiple flooding cycles take a mere eight minutes.

With increasing frequency, customers are seeking to understand how clean is clean? Many subcontract suppliers are being asked to deliver product to a cleanliness standard such the ISO-16232/VDA19 automotive standards. The MicroQuick particle scanner from RJL Micro & Analytic is the perfect device for engineers and laboratory staff to understand the levels of particulate residues left on parts after cleaning. Unlike light microscopes, MicroQuick takes just a few minutes to perform the complex task of scanning the 48 mm diameter membrane. MicroQuick can count, size and produce an entirely documented report.

Kumi Solutions, therefore, represents a business that not only sells and services some of the most advanced parts cleaning systems in the world but is also committed to the pre- and post-production challenges faced by customers.

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Reliable final cleaning with DOWCLENE and MAXISTAB SD-5

VIA Oberflächentechnik relies on modified alcohol with stabiliser for final cleaning

If industrial parts cleaning is offered as a service, this confronts the cleaning service provider with special challenges. The enormous variety of oils and residues on the parts to be cleaned can lead to the creation of organic acids or sulphur compounds and as a result to odour nuisances, corrosion and other possible damage to the cleaning system and items to be cleaned. The new MAXISTAB SD-5™ sump stabiliser, which is added directly to the distillation unit in the system, acts both preventively as well as reactively with regard to such challenges. VIA Oberflächentechnik has been using the stabiliser for about a year and since then has a significantly improved cleaning process.

VIA Oberflächentechnik, based in Lennestadt, has been providing industrial parts cleaning for absolute product cleanliness since 1996. VIA is a specialist when it comes to the degreasing, cleaning and polishing of industrial workpieces. From filigree small parts to massive parts weighing a tonne, the company cleans all parts of industrial production in programmes specially adapted to the component. The company generates an annual turnover of approximately eleven million euros in three plants in Germany and one subsidiary in Poland.

Parts cleaning to the highest standards

At the Lennestadt location, the company meets the cleaning requirements of the customer in a total of ten different systems with different processing features.

"We have been catering to the wishes and concerns of our customers for twenty years, with high standards for our own services. Our goal is to find the optimal cleaning process for each workpiece," explains VIA Oberflächentechnik's Kai Lechner.

Final cleaning in DOWCLENE 1601

For many customers with high demands on the cleanliness of the parts, an optimal cleaning process also includes final cleaning. When it bought a new system in 2008, the decisive factor for VIA was also to be able to work with modified alcohols during final cleaning. It chose a machine from Dürr

Ecoclean (today SBS Ecoclean Group). Since 2008, the company has been using the DOWCLENE™ 1601 solvent from SAFECHEM in the system. While the cleaning results were always outstanding, the periodic bath monitoring revealed that acid had been produced in the system. The highest value measured was about 5,000 ppm. Consequently, VIA changed the solvent in the distillation unit up to four times a year and had to subject it to an elaborate cleaning process. Including the time needed for the machine to cool off, this meant a downtime of the system of about two shifts in each case. Additional standstill times arose due to the need to change gaskets.

Process reliability with MAXISTAB SD-5

VIA contacted the solvent manufacturer SAFECHEM for the troubleshooting. The stabilisers of the MAXISTAB S-series proved to be the ideal solution. Developed to act without contact against organic acids and when using sulphurised oil, MAXISTAB SD-5 is the ideal sump stabiliser for the challenges faced by VIA. After a renewed bath change in October 2016, VIA Oberflächentechnik used MAXISTAB SD-5 for the first time. The

stabiliser proved effective immediately. Since then, the problem of over-acidification has been completely eradicated and the acidic values have remained consistent in a reliable range, thanks to the admixture of MAXISTAB SD-5. The stabiliser MAXISTAB SD-5 acts efficiently to prevent the production of sulphur and acids in the system.

The admixture of MAXISTAB SD-5 at VIA occurs at regular intervals through the distillation unit. It is filled in during ongoing operation: the stabiliser is drawn into the vacuum distillation, where it remains. This mode of action ensures that neither sensitive gaskets, flaps and similar parts of the system come into contact with the stabiliser or the workpieces to be cleaned. The stabiliser prevents the formation of organic acids, which can lead to problems like corrosion or shortened service life of gaskets and extends the bath service life. The cleaning process is stable and efficient.

The process reliability achievable with MAXISTAB SD-5 can also be measured in euros and cents at VIA Oberflächentechnik: "Since the end of October 2016, i.e. for about 11 months, we have not made any more bath changes and not cleaned the distillation either. Compared to the quarterly bath changes, this is naturally a huge saving in effort, costs and downtimes. Since the system runs continually in two-shift mode, we are talking about big savings here," reveals Kai Lechner.

No more odour on parts

Another effect of the stabiliser is evident at VIA as a positive side effect: "Our customers, 90 percent of which come from the automotive industry, only contact us occasionally if something isn't running ideally. Occasionally, customers used to complain that there was an unpleasant odour of sulphur on the cleaned parts," explains Kai Lechner. "But since we started working with the stabiliser, no customer has called us anymore."

VIA owes this fact to the active operation of MAXISTAB SD-5 against the formation of sulphur and organic acids in the system.





The cleaning system from Dürr Ecoclean (today SBS Ecoclean) installed in the final cleaning room at VIA

Other service elements for outstanding cleaning results

To facilitate a reliable process, regular checks of the solvent are indispensable. SAFECHEM provides a MAXICHECK test case with all the accessories needed, specially adapted to the solvent and stabiliser system, for regular measurement of the alkalinity. The results of the analyses are recorded in an operating diary and forwarded to SAFECHEM. The view from

outside of the processes at the customer and on the use and consumption of solvents provides the latter with important information that contributes significantly to the great process reliability and economic efficiency.

"The operating diary has always been a great assistance to us, because we can detect the condition of the solvent and any harmful developments with easy measurements. We fill it out regularly and

send it to SAFECHEM. As a result, we feel very sure about our cleaning process," concludes Kai Lechner.

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New ultrasonic lines for meticulous cleaning

Turbex will launch its ProLine 2 range of automated cleaning lines at MACH, intended for applications where a very high level of precision cleaning is needed. There are four variants in the modular, fine and ultra-fine cleaning line range: Easy, Auto, Semi and Auto+. Available in five tank sizes, they offer different levels of capability including semi-automatic handling and also cater for various component weights and production quantities. The Auto+ model includes a noise reduction enclosure that doubles as a clean room interface.

A hallmark of these machines is multi-frequency ultrasonics, enabling a single transducer to generate two different ultrasonic frequencies. Cycle times can be significantly shorter and there is the added advantage that dis-similar components and materials can be processed in the same tank. An additional feature of ProLine 2 is the option of side-mounted ultrasonic technology for special component geometries.

All products, which range from bespoke, multi-tank cleaning and drying lines down to small bench-top units, are aimed primarily at high-end manufacturers in the optics, medical, and precision manufacturing industries. However, the aerospace, automotive, nuclear, electronics and general engineering sectors are also target markets.

Global and targeted cleaning in a single process

To be promoted for the first time in the UK will be targeted cleaning, rinsing and drying technology in a single chamber machine. It works alongside global spray-flood action, coupled with highly controllable kinematics

and rotatable ultrasonic transducers. The targeted / global tandem process is intended for efficient and reliable removal of swarf, oil and other contaminants from difficult-to-reach areas such as undercuts, blind bores and intricate channels.

Aimed in particular at manufacturers in the hydraulics and diecasting industries, it addresses the problem of accessible surfaces of complex components being over-cleaned before the cleanliness of interior contours meets the required specification.

Central to the new process is a tool positioning system into which the parts to be cleaned are fixtured. Via integrated nozzles in specific locations to suit the components, water or air is guided directly to bores, channels, holes and other difficult areas to be cleaned. Newly developed central bearing kinematics with dual-channel rotary feedthrough assist projection of the cleaning medium, making it flow with a high degree of turbulence.

Currently, targeted cleaning is available on the JAVA and PALMA machines. Other benefits of the process include lower process temperature and hence energy savings, shorter cleaning times, reproducible quality and reduced consumption of cleaning chemicals. A video showing the principle of targeted cleaning and drying may be viewed at:

www.youtube.com/watch?v=PA4-kmbHH7U

Processing of larger components

A heavy-duty Turbex aqueous washing machine will be on the stand from the supplier's AC-range of front-loading, spray

washing and rinsing models. These have proved particularly popular in the UK for degreasing, precision cleaning, phosphating, paint removal, descaling and de-rusting. Manufactured from stainless steel, the AC programme comprises both single- and multi-stage units with options for one, two or three process tanks. Standard sizes range from one to three metres in diameter, although larger machine sizes are available.

These PLC-controlled machines provide a high level of cleaning performance due to ingenious design principles combined with high spray pressures and liquid flow rates achieved by the powerful pump. The spray system, also of stainless steel, rotates around a fixed load that can weigh several tonnes. Acoustic as well as thermal insulation protect operators from undue noise and heat.

Air blast and hot air-drying stages are optional, as is gas instead of electric heating. Other optional accessories include steam extraction, automatic refill, an oil skimmer or separator and a detergent dosing unit. A manually operated spray lance with its own impeller pump can also be supplied, allowing particularly awkward soils to be removed. Alternatively, temporary use of the equipment as a manual spray booth is possible.

Ultrasonic tanks

Completing the exhibits will be models from the Turbex range of bench-top and floor-standing ultrasonic cleaning tanks, which can be used stand-alone, as bench-mounted units or as part of an integrated modular cleaning system.



Available in a variety of sizes, they feature a welded stainless-steel tank, double lid with thermal and acoustic insulation, thermostatically controlled indirect heating in the side walls, and an electronic control with digital time/temperature display. A level guard cuts off the heating and ultrasonics if there is insufficient liquid in the tank.

A variety of options is available, such as stainless-steel work baskets, filtration, a storage tank with oil separator, and a hot air dryer.

Turbex Ltd was established in 1981 and specialises in supplying aqueous systems for component cleaning. The company offers a wide choice of batch and in-line cleaning machines of the highest quality running to over 100 standard models, backed by expert advice on cleaning agents, component handling and process specifications.

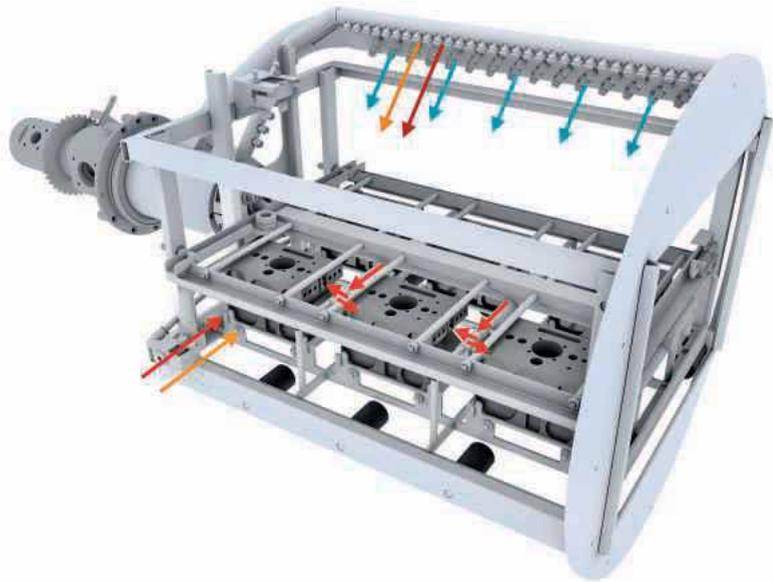
The company provides total product support for all component cleaning requirements, based on a long-term partnership approach with its customers. Turbex is the powerful force in component cleaning for the aerospace, automotive, rail,

medical, optics, electronics, manufacturing and subcontracting industries.

Turbex has extensive facilities and machines which enables it to carry out comprehensive cleaning trials for both existing and new customers. At the Alton component cleaning technology centre, it can demonstrate the latest cleaning methods including spray wash and ultrasonics with rinsing, oil separation and

filtration on both manual and automated systems.

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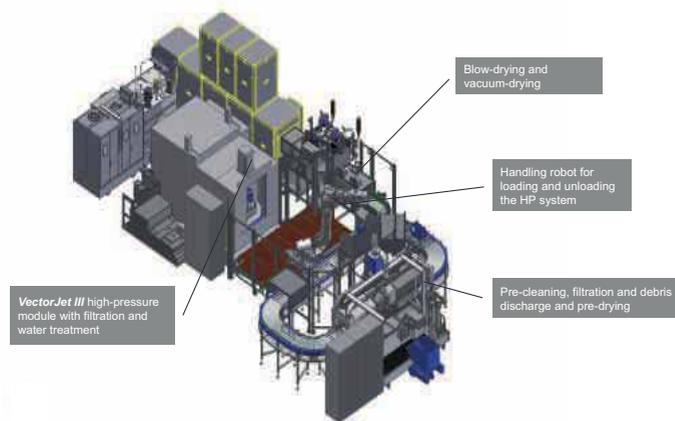
Cleanliness is more than a trend. The development that has caught on in recent years is already sustainable and has significantly changed the manufacturing structures in many foundries. There has been a considerable increase in mechanical machining immediately after the casting process. This is especially true for complex components such as crankcases and cylinder heads. The days when only risers and sprues had to be sawn off are over. Bearing faces, transport, index and mounting holes, surfaces and a lot of other machining points now often have to be machined by the casting manufacturer. This is also associated with increased demands on the delivery condition.

Automotive manufacturers' specification sheets not only include perfect casting quality, machining dimensions and surface quality, but also requirements for cleanliness and an absence of burrs and shavings. This challenge was also faced by the company NEMAK based in Dillingen in Germany. It had to produce 3- and 4-cylinder crankcases.

In addition to casting and machining, the company was tasked with cleaning the components. Several alternatives for cleaning the parts soiled with moulding sand, casting debris, shavings and cooling lubricants were investigated for this purpose. The system should be as automated as possible, flexible with regards to parts, as deliveries may be chaotic, process-reliable and energy-saving. The complex internal water and oil chambers of the crankcases were seen to pose particular difficulties.



VectorJet III from PILLER Entgrattechnik: The high-pressure system has the same degree of freedom as a 4-axis machining centre and can be automatically loaded and unloaded



NEMAK decided on the solution offered by PILLER Entgrattechnik based in Ditzingen-Heimerdingen in Germany. At the heart of the multi-stage cleaning system is the VectorJet III high-pressure water jet system, which accesses the component contours with a 4-axis movement using a wide variety of injection tools and removes debris and shavings from the crankcases. At the same time, the high-pressure water jet also eliminates machining burrs. The VectorJet III system also includes a supply module for the cleaning and treatment of the HP washing medium. This HP process is preceded by aqueous spray cleaning with filtration and debris discharge, as well as pre-drying to reduce the propagation of the first cleaning medium. The components are bolted to a workpiece carrier and transported via a roller conveyor to a handling robot. The HP process is followed by blow-drying and vacuum-drying as preparation for the leak tests.

Complete cleaning system for 3- and 4-cylinder crankcases with subcomponents

In this project, PILLER Entgrattechnik was able to draw on experience from many different automotive projects and design a cleaning system manufactured completely in-house. Particular attention was paid to two aspects: first of all to the filtration and cleaning of the two-wash media that carry a high pollution load after the casting and rough machining process; secondly to a solid design of the variety of high-pressure tools, so that the requirements for cleanliness of these very complex components can be met. The opportunity to try out individual HP parameters and tools in advance at the in-house PILLER technical centre was again advantageous. The system was installed at NEMAK in Dillingen, put into operation and now works in the full production process. The cycle time per crankcase is less than one minute.

The focus on workpiece carrier transport and the use of a VectorJet III system has yet another advantage for NEMAK. Michael Thorn, project manager for the project at NEMAK in Dillingen, explains: "The flexibility of the Piller system concept even enables us to use the system to clean and dry geometrically different components. The high-pressure spray programme can be adjusted with further high-pressure tools and freely programmable movement paths. This means we are also prepared for future projects."

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Superior cleaning efficiency through better task adaptation

Purpose-designed water based cleaning systems

The application fields of part cleaning processes using aqueous media range from coarse through intermediate to fine and ultrafine cleaning. Before an investment in suitable cleaning equipment is made, key questions regarding cleaning quality, throughput, cycle times, process stability and cost-efficiency must be answered. Ecoclean addresses these aspects via different machine concepts adapted to the respective industries and tasks.

Whether it's in automobile manufacturing or its supplier industries, medical equipment production, mechanical engineering, machining, punching, drawing or bending of components, precision mechanics or optical devices, water-based cleaning with alkaline, neutral and acidic media is the technology most frequently employed in industry. True to the principle of "like dissolves like", it enters the field whenever water-based, polar, contamination need to be removed. For water-based part cleaning processes, Ecoclean offers an extensive range of both standard cleaning systems and customer-specific designs. An optimum adaptation to the tasks and demands of distinct industries is key to superior cleaning quality, higher process reliability and plant availability, in addition to saving costs and resources.

The yardstick of cleaning quality and efficiency for robot cells

Short cycle times and high flexibility has made robot cells an indispensable item of production equipment when it comes to preliminary, intermediate and final cleaning of engine and transmission parts such as cylinder heads and crankcases in automotive



manufacturing. With its EcoCflex 3M/3L, Ecoclean sets new standards for such cleaning systems. This is due partly to the SCARA manipulator developed specifically for use in cleaning equipment, replacing the conventional adapted 6-axis articulated arm robot. Thanks to its rugged design, consisting exclusively of high-strength aluminium and high-grade steel, augmented by an IP 69 protection class rating, the unit resists high-pressure water jets and is submersible. Ecoclean has not merely adapted the robot itself; its control system too is matched to the application. The assembly can be operated conveniently via the CNC controller of the cleaning machine. The need for a separate PLC controlling the robot, which used to be a standard configuration, has thus been eliminated. Equipped with application-specific innovative process technology, the EcoCflex 3 enables the user to realise high and low pressure processes, as well as injection flood washing flexibly in one cleaning station.

Forward-looking chamber systems for water-based cleaning processes

The many and diverse tasks related to degreasing, intermediate and fine-cleaning of parts across a broad range of general industry applications are covered by

Ecoclean with a range of different water-based cleaning systems. The EcoCube, an optimum entry-level model, is suitable for a variety of functions. With installation dimensions of only 2,100 x 1,630 x 1,855 mm (L x W x H) in addition to low weight, this compact unit can be integrated into a manufacturing line easily and in minimum time. Due to the perfectly adapted size of its two standard flood tanks, it reaches its operating temperature quickly and in an energy-efficient manner. The EcoCwave, with its vacuum-tight work chamber, is designed for immersion and spray processes ranging from coarse through intermediate to ultra-fine cleaning. A genuine all-rounder, it is equipped with two or three tanks as standard depending on the application. These tanks are mounted upright and of flow-optimised design to prevent the formation of chip or dirt pockets. In addition, each tank has its own separate cleaning fluid circuit with full-flow and bypass filtration. Thanks to an optimised rollover unit in the work chamber, the fluids and mechanical cleaning devices can reach the product effectively from all sides. All this not merely helps to improve cleaning quality but also tangibly increases the fluid lifetime, thereby reducing cleaning costs. EcoCmax systems can be easily adapted to the

contamination type and specified cleanliness level by adjusting the cleaning program. A single-chamber system for three-stage cleaning processes plus drying, it features full-flow filtration in the work chamber filling and draining circuit, as well as continuous bypass filtration on all flood tanks for reconditioning the rinsing baths via an integrated evaporator with heat recovery.

High process reliability for maximum cleanliness standards

Part cleanliness specifications, limiting particulates to the single-digit micrometer range and below while also imposing ultra-exacting thresholds for film-type



contaminants, are routinely imposed in diverse industries today. Such complex tasks are the domain of UCM AG, the precision applications business unit of the SBS Ecoclean Group. Starting out from a specific part geometry, material, contamination and cleanliness requirement, the company develops made-to-measure cleaning processes and corresponding ultrafine cleaning equipment comprising ultrasound technology. These ultrasound-based ultrafine cleaning systems are built to deliver unsurpassed levels of cleanliness reliably and efficiently. To this end, they are equipped with UCM's proprietary four-sided overflow system as standard.

Another feature of these machines is that all components are of flow-optimised design to prevent accumulations of foreign matter or stagnant water. The ideal equipment and process technology, as well as process parameters for a given application, can be effectively and reliably determined through cleaning trials with authentic contaminated parts at Ecoclean's and UCM's test centres.

The SBS Ecoclean Group, formerly Dürr Ecoclean, develops, manufactures and distributes future-oriented machines,



systems and services for industrial parts cleaning and surface processing. These solutions, which are technology leaders, support companies around the world to manufacture products efficiently and sustainably in high quality.

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The turning of the screw in metal pretreatment for cold forming operations

Henkel Adhesive Technologies has sharpened the market fit of its Bonderite L-FM FL portfolio of polymeric coatings for the surface conversion of metals used in cold forming operations. The optimised Bonderite L-FM FL process reduces the number of treatment steps from as much as ten to one or two and is fast emerging as an attractive alternative in the production of high-performance automotive bolts and screws.

Medium carbon or alloy steel grades designed for cold formed threaded fasteners in property classes such as 8.8., 9.8, 10.9 and 12.9 require a prior surface conversion process to create a thin, adherent coating that will facilitate deformation and ensure the high quality of the final products. In the automotive industry, these cold formed screws and bolts are used in a wide range of engine, powertrain, suspension, wells and other demanding applications.

Traditional zinc phosphating and reactive soap processes, although well established in metal pretreatment for cold deformation, are associated with a number of potential drawbacks, including high acidity as well as high energy consumption and phosphate sludge. Moreover, they can involve up to ten individual steps, from initial degreasing and pickling to activation, phosphating and soaping with frequent intermediate rinsing.

Emilio Bucci, Henkel's business development manager for cold forming in Europe, says: "With Bonderite L-FM FL, Henkel has developed an innovative solution to all these challenges that provides a flexible one-step process with superior cost performances, reduced CO₂ impact and a much smaller water footprint."



Inherently more sustainable

Bonderite L-FM FL is a non-reactive, water-based polymeric coating that enables a sustainable surface conversion process. Since the coating adheres to the surface physically without any reaction, the only evaporates produced in the subsequent drying step prior to cold deformation are aqueous. As a one-step process, Bonderite L-FM FL eliminates all rinsing steps, which saves water, and also has a reduced energy demand with appropriately lower CO₂ emissions. Furthermore, when the cold formed screws are dephosphatised for final heat treatment, the polymeric coating is easier to remove, which permits the use of a dephosphating cleaner in much lower concentration, which means less consumption.

Significantly more cost-efficient

In addition to these environmental benefits, the Bonderite L-FM FL technology is characterised by its greatly reduced complexity over zinc phosphating. As a singlebath process, it minimises equipment footprint and maintenance. Raw material surface properties require initial sand blasting or pickling and neutralising, but the conversion cycle is essentially simplified to one single step and operates at a temperature between 40°C and 50°C, providing significant time and energy cost savings. Overall productivity is also enhanced by the excellent lubricity and

pressure resistance of Bonderite L-FM FL in comparison with traditional zinc phosphating processes, which results in longer extrusion die life and has been confirmed in numerous industrial-scale applications.



Easily integrated in any production line

Emilio Bucci says: "With its proven cost advantages and sustainability, Bonderite L-FM FL is considered the single most efficient and responsible surface pretreatment process in metal cold forming and is fast emerging as the industry's preferred technology especially in the global market segment of demanding automotive bolts. The simplicity of the process also means that it can easily be integrated in in-line as well as in batch production lines."

To help cold forming manufacturers maximise the productivity of their Bonderite processes, Henkel recommends the use of its dedicated Lineguard Automatic Line Control system. Lineguard is available in modular hardware and software configurations that enable precise and efficient bath management up to fully automated pretreatment control. It features state-of-the-art PLC, sensor and HMI technology that is seamlessly integrated by the company's specialists to provide a total system solution tailored to each customer's individual needs, including process data acquisition and comprehensive documentation.

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MANUAL PROCESS

The Aquablast 915 is the entry level machine in the Aquablast range and brings huge benefits to a wide variety of industry sectors, including aerospace, automotive, construction and specialist manufacturing. The moveable footswitch, wiper and wash adjustments make this machine ideal for production purposes.



AUTOMATED PROCESS

The Aquablast Tumbler machine batch washes small parts which are turned in the drum and simultaneously blasted. The Aquablast Front Loading Tumbler operates using a PLC controller. This controller is programmed with the various functions needed to produce a consistent finish on batches of components. Automatic wet blasting machines can free up time for customers and help improve efficiency.

ROBOTIC PROCESS

The Vixen Robotic Wash Plant has 3 robots internally and 4 wash stages. This machine was manufactured to keep up with the reducing machining times and high cleanliness levels for the automotive industry. It has been designed to meet the most stringent specifications working alongside the customer to ensure all of the requirements are met to the highest standard.



ISN'T IT TIME YOU CAME CLEAN WITH US?

Safran Landing Systems continues ascent with NHE process tank liners

Safran Landing Systems is a leader in aircraft landing and braking systems, including landing gear and system Maintenance, Repair and Overhaul (MRO) activities for civil and military aircraft. Its UK support centre in Gloucester needed an innovative approach to lining its hard chrome plating tanks, to improve plant uptime and reduce maintenance costs, and turned to NHE to deliver it.

As a specialist in the design, manufacture, installation and management of surface treatment process plant, NHE provided a tank lining solution that increased corrosion resistance and durability, while increasing efficiency for the Safran Landing Systems MRO facility.

Safran Landing Systems' maintenance, repair and overhaul facility in Gloucester uses Electrolytic Hard Chrome (EHC) plating to improve the durability and abrasion resistance of landing gear. Its process involves submerging components in tanks containing a highly carcinogenic and corrosive chemical mix. The tanks have a 9,000-litre capacity and the chemicals need to maintain a constant temperature of 50 to 55°C.

The company adheres to the Control of Major Accident Hazards (COMAH) regulations, which has strict requirements

relating to the integrity of plant used with hazardous materials. The tanks have to be tested frequently in accordance with the company's planned preventative maintenance schedule for COMAH compliance. One aspect of the smart testing process involves removing the chemical solution and checking the integrity of the tank lining.

The company found that corrosion led to conventional tank lining systems needing frequent replacement and the objective was to maximise plant availability time to support the customers.

The solution

Safran Landing Systems turned to NHE to provide a longer-lasting tank lining that was easier to replace. After a thorough site analysis, NHE recommended Koroseal® PVC lining and LFP CrossFilm™ skirts from Witt Liners. Witt Liners is a world-renowned manufacturer specialising in corrosive materials, and NHE is its exclusive UK supplier.

Ultimate corrosion resistance

Koroseal PVC lining has a proprietary compound formulation that provides high resistance for harsh corrosive environments. It has been rated either A1 or A2 for performance in the containment of chromic acid ranging in strength between 5 percent and 30 percent.

The LFP CrossFilm skirt provides a secondary line of corrosion defence. Importantly from a durability perspective, the skirts have the chemical inertness of Teflon but can be fabricated into complex shapes and sizes. This provides a distinct advantage over traditional PVC options that are essentially sacrificial and require regular replacement. NHE advised Safran to cover the Koroseal lining with the LFP skirt at the tank's upper and lower solution levels. These areas experience a high concentration of chrome vapour that attacks the tank lining, leading to a shorter service life and longer downtime. Using an LFP skirt offers greater protection to these critical interface areas, eliminating the risk of chemical exposure where the lining is most vulnerable.



Easy installation

NHE creates each liner off-site and forms it in a single piece to fit the tank perfectly, even accounting for all irregularities, outlets and flanges. Engineers then transport the lining to the tank in a seamless logistics operation and complete the installation in two to three days.

Unlike conventional liners that use traditional bonding methods, Safran Landing Systems' new solution is fabricated using Witt Lining's drop-in liner technology. This eliminates the need for shotblasting, saving time and money on installation while improving performance and corrosion resistance.

NHE honed the installation process by trying sample solutions in different operating conditions. This gives customers/manufacturers the flexibility to manage risk and react quickly in line with its Major Accident Prevention Policy (MAPP) under COMAH.

Why NHE?

Safran Landing Systems chose NHE for its track record and expertise delivering operational efficiencies, safety improvements and cost savings in highly corrosive environments.



Joanne Dunford, chemist at Safran Landing Systems Gloucester facility, says: "Over the past five years, we've been reviewing different liners that keep up with our rigorous process demands. As a result, we've had to integrate time, and resource, intensive tank maintenance into our processes to meet our high safety and quality standards.

"Thanks to NHE's expertise, we now have a better-performing, more cost-effective lining solution that puts us at the forefront of efficiency and health and safety. From consultancy to engineering to installation, NHE has added value at all stages."

Andy Shears, technical sales manager at NHE says: "Safran Landing Systems' tanks are the ideal application for Witt Linings' innovative solutions. The market-leading corrosion resistance, coupled with the easy-to-install drop-in technology, has delivered substantial value financially as well as in efficiency and greater uptime."

NHE is a leader in the design, manufacture, installation and management of process plant for surface treatment, non-destructive testing and process water recycling. Its offering includes fully automated process plant to smaller manual



lines, spares and specialist equipment. The company has more than four decades' of experience worldwide and operates through the joint expertise of Plasticraft,

Ardrox Engineering and Lancy Technology. NHE provides a full-service capability that consistently demonstrates the benefits of sourcing complementary services from a single supplier.

Norman Hay plc is a global chemical, sealants, surface coatings and engineering group with over 60 years trading history. Headquartered in the United Kingdom, the group operates four main divisions: Ultraseal, the market leader in impregnation chemicals and process equipment; Surface Technology, specialists in the development and application of surface treatments with well-known brands including Armourcote; SIFCO ASC, global leaders in selective plating; NHE, manufacturing bespoke process plant and equipment.

NHE

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See Safran Landing Systems at:



Handtmann purchases shot blasting machine from AGTOS

At the EUROGUSS exhibition, which took place from 16th to 18th January in Nuremberg, it was announced that Handtmann Leichtmetallgießerei Annaberg GmbH ordered a wire mesh conveyor shot blast machine from AGTOS.

Raffael Schaarschmidt, head of Mechanical Processing and Arndt Viertel, production manager, as well as Andrea Totzauer, purchasing/accounting and Nicole Werner, commercial director, celebrated the acquisition with Thomas Herhold from the AGTOS sales department.

The blasting machine, equipped with eight turbines, is used for the cleaning and deburring of aluminum die-casting parts. It is specially designed for the workpieces and

the blasting material is made of aluminum. The parts are processed at a belt speed of 0.5 to 2.5 m per minute. Handtmann is another leading manufacturer from the aluminum industry deciding in favour of AGTOS blasting technology.

Maintain the value of your blasting machines

Maintaining blasting machines poses particular challenges for users. The abrasive effect of the blasting media can quickly lead to severe damage to machines. It is important to AGTOS that your machines keep running. This is precisely why the company offers different services to help you with your daily work. Localised servicing with long-term partners ensures quick communication, while experienced in-house and field technicians answer questions and solve problems.

You will receive the best possible support due to the combination of knowledgeable office staff and flexible service technicians.

AGTOS service offers spare parts, modernisation, maintenance agreement,



remote maintenance, repair and inspection. Supported by highly qualified staff, a group of experts is at the heart of the AGTOS team.

AGTOS was introduced to the market begin October 2001. The most important principle of the company's philosophy is the complete satisfaction of the needs and wishes of its customers. The AGTOS team can draw on an enormous wealth of experience in the development, construction, manufacturing and marketing of turbine-wheel shot blast equipment.

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Complete reliability and lowest running costs with 2018 Tundra air dryers

Hi-line Industries, an established and reputable UK manufacturer of high-quality compressed air purification equipment, has made a number of enhancements to its already class-leading Tundra range of refrigeration dryers. Thanks to an impeccable reliability rate with zero failures from hundreds of models already sold, the 2018 series is offered with a new two-year warranty. Moreover, the latest dryers provide the lowest possible running costs and increased flow via a new Hi-Flo heat exchanger with larger ports.

Already long-established as the UK's market-leading refrigerant air dryer, the 2018 Tundra range is Hi-line's most energy efficient to date, with a robust and high-quality build standard. Minimal energy consumption is crucial in today's competitive environment and the new Tundra dryer from Hi-line will help drive down energy costs by minimising pressure drop and lowering absorbed power.

Among many proprietary innovations, Hi-line's integral Direct Expansion technology offers a constant +3°C dewpoint at all times, unlike chilled mass dryers, which can be as high as +10°C during their thermal cycle. Furthermore, the new and improved single-cell, all-aluminium heat exchanger module gives the most efficient transfer of heat at the lowest energy cost.

Another important energy-saving feature of the latest Tundra dryers is the variable-speed fan, which ensures only the required amount of energy is consumed. Moreover, by controlling the fan speed on the refrigerant circuit, Hi-line has been able to eliminate components such as fan-pressure switches, which can often become defective in this type of dryer. The fewer moving parts, the more reliable the product.

Continuing the low-energy, high-reliability theme, 2018 Tundra dryers are built with Scroll refrigerant Freon compressors, which offer the lowest possible power consumption and deliver a cost-effective, long-life performance. With reliability at the forefront, Tundra 2018 models offer multiple new design features to ensure constant dewpoint at all load levels and deliver continuous dry-air performance that satisfies ISO 7183 industry



standards. Another benefit of Tundra refrigeration dryers sees the microprocessor-based multifunctional controller linked to the condensate removal valve, thus minimising any loss of compressed air as the condensate is discharged. Full programmability ensures settings can be adjusted to suit climatic conditions. The 2018 Tundra also has the option of Hi-line's ZLD zero-loss auto drain, which is designed to eliminate accumulated contaminants from pressurised air systems. ZLD drains incorporate a level control that ensures zero air loss during the condensate discharge process.

Tundra refrigeration air dryers are proven in applications such as workshop air and machine air in general manufacturing, as well as further uses in sectors that include packaging, textile, food, beverage, medical, dairy and automotive. Dryer selection is based on factors such as maximum compressed air flow, lowest operating pressure, maximum ambient air temperature and maximum air inlet temperature. Hi-line's applications team can help apply a corrected capacity formula to ensure the optimum dryer is selected.

The 2018 Tundra series comprises 16 models spanning compressed air flows from 22 to 1,700 cfm, 37 to 2,888 m³/hr, and

operating pressure from four to 16 barg. Maximum inlet air temperature is +60°C, with ambient air temperature up to +50°C. High pressure up to 50 barg and thermal mass versions can be ordered. Hi-line's standard range is available ex-stock from the company's Burton factory for next-day delivery, with larger dryers up to 9,988 cfm available on short lead-times.

Hi-line Industries, established in 2000, has built up an enviable reputation for the innovative design, manufacture, supply and installation of energy efficient compressed air purification equipment. It is a member of the British Compressed Air Society and is ISO 9001:2008 certified.

As a UK designer and manufacturer of compressed air dryers and nitrogen generators at its site at Burton-upon-Trent, Staffordshire it is supporting the "Made in Britain" campaign which highlights the passion around British-made brands and UK manufacturing. Its equipment is designed and built to the highest standards of quality by experienced and qualified engineers.

Hi-line Industries Ltd
Telephone: 01283 533377
Email: enquiries@hilineindustries.com
www.hilineindustries.com

Hodge Clemco blast-room ensures the perfect finish

The manufacturer of two of the most iconic brands in grass-care and grounds maintenance equipment used at international sports venues around the world has upgraded production with a self-contained blast-room from Hodge Clemco.

Dennis mowers were used at stadia for the FIFA World Cups in South Africa and Brazil and will be in action again in Russia this year. Like SISIS ground-care machinery manufactured by Howardsons, Dennis mowers are also used by top sports clubs in many countries as well as local authorities and education establishments.

The durable, high-quality finish expected by customers requires effective surface preparation of the mild steel components before they are powder-coated. The company previously used subcontractors for this work but has now brought the process in-house in order to improve production flexibility and quality control and reduce damage to components in transit.

The new blast-room is designed for work on fabrications weighing from 2 kg to 50 kg,



using chilled iron abrasive. Located inside an existing building, the chamber is 6 m long x 4.5 m wide, with walls and roof manufactured from double-skinned insulated steel panels, which reduce sound transmission. The floor is lined with steel plate. Air inlet ducts and exhaust points around the chamber ensure effective dust extraction and air ventilation.

The blast machine is a high-production direct-pressure unit that feeds a 10 mm ID tungsten-carbide-lined nozzle that provides maximum blasting velocity, uniform abrasive distribution and a high work-rate. It also allows low-pressure blasting when required.

The machine is joined directly to a three-tonne storage hopper, forming a totally enclosed feed system.

The abrasive recovery system consists of a large floor hopper into which operators sweep used material and which is linked to a separator system that removes contaminants, fines and dust. Clean abrasive is returned automatically to the main storage hopper. Dust is collected on filter cartridges and automatically deposited in bins for disposal.

Hodge Clemco, incorporated in 1959, has developed into a leading company in the surface finishing industry. Part of the 100-year-old Samuel Hodge Group, Hodge Clemco is part of a diverse engineering group, founded around the marine industry.

Hodge Clemco Ltd
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Producing the gold standard in scissors

William Whiteley & Sons, the oldest scissor-maker in the western world, has chosen Wallwork to provide the Titanium Nitride PVD coating on the new EXO Gold scissor.

The EXO range has been developed with assistance from the Advanced Manufacturing Research Centre (AMRC) at the University of Sheffield, using state of the art 3D tooling, surgical grade stainless steel and advanced coating materials, including TiN from Wallwork.

With a history dating from the mid 1700's, Whiteley is adopting distinctly modern technology to launch the EXO range. Using a Kickstarter crowdfunding campaign, the company aims to bring the benefits of the advanced scissors to craftsmen and women around the world.

The scissors can cut through the toughest materials encountered by tailors and haberdashers, crafters and DIYers, boaters and interior designers. Fully functioning prototypes have been trialled in London's Savile Row with master tailor Andrew Ramroop OBE, director of Maurice Sedwell

bespoke tailors, who has praised them for being "light, precise and comfortable."

With a lifetime guarantee, the scissors can be personalised to the buyers' individual requirements. Pledges start at £55 for a striking matt stainless steel finish, to £115 for a Wallwork TiN super luxe gold ceramic coated pair with a surface harder than tungsten carbide.

The Kickstarter has already reached its funding goal, ensuring that production will begin. The campaign is contributing to the setup costs of the high-quality tooling, new machinery and innovative material finishing processes required to produce EXO at the Whiteley factory in Sheffield.

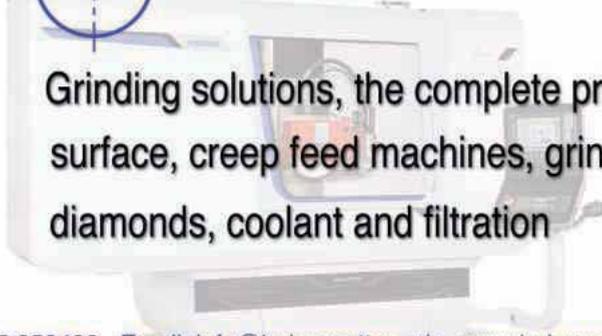
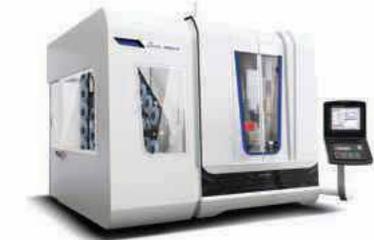
The campaign runs to December 28th and can be supported by clicking here. All supporters through Kickstarter will save 20 percent on recommended retail prices.

Founded in 1760, William Whiteley's has a vast historic legacy. Incorporating the firm of Thomas Wilkinson & Son in 1875, the company inherited the appointment of 'Manufacturers of Scissors in Ordinary to her Majesty Queen Victoria and Cutlers to



H.R.H. Prince Albert' in 1840. Both firms were awarded prize medals at the London exhibitions in 1851 and 1862, and the Paris international exhibition in 1855.

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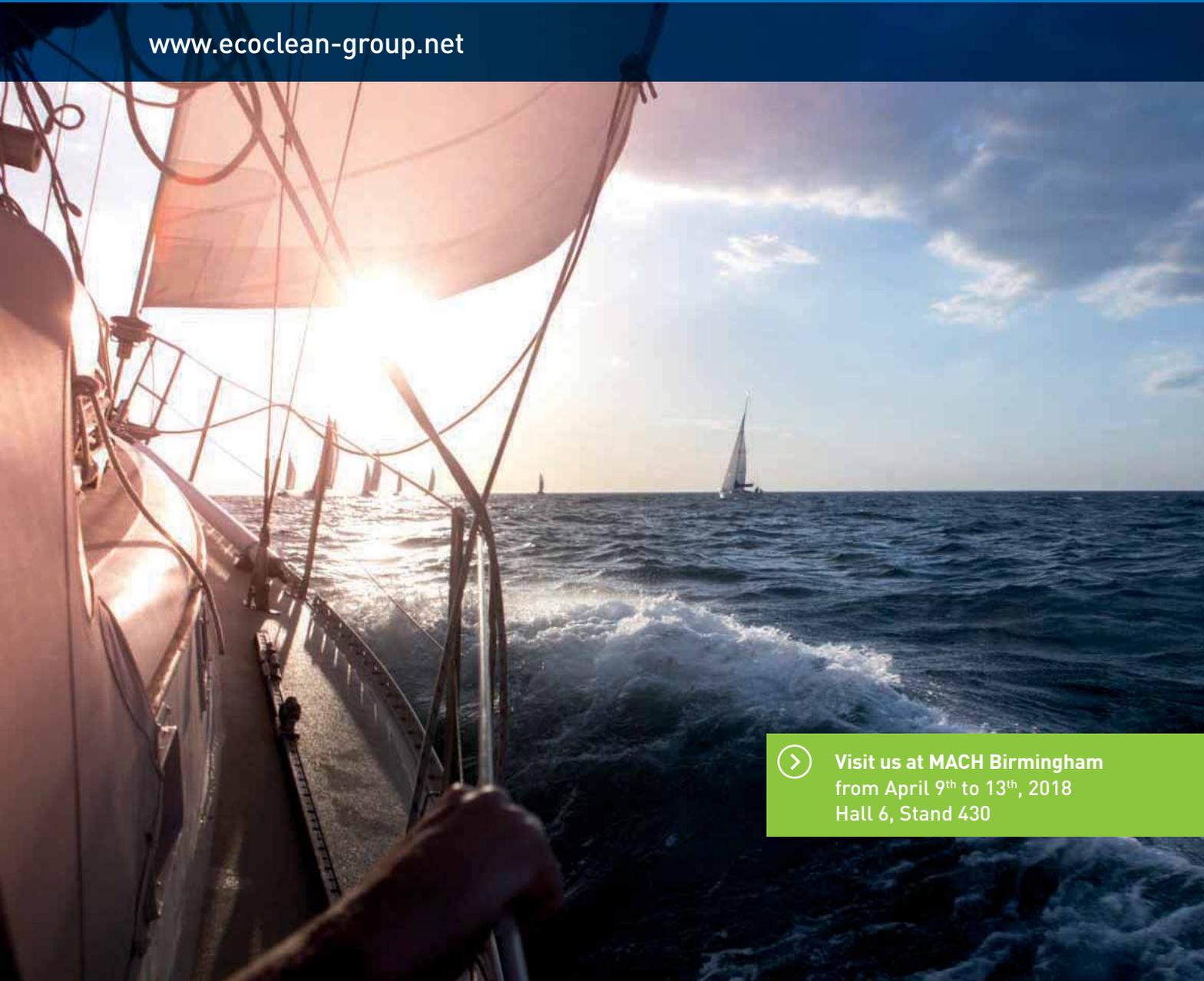


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