GRINDING & SURFACE FINISHING

SEPTEMBER 2020

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SEPTEMBER 2020
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STUDER focuses on its strengths

With its new image campaign, STUDER is focusing on its motto "The Art of Grinding" and talking about what the company does best: The art of grinding

The health crisis around COVID-19, Brexit, global trends towards trade restrictions and customs barriers, the structural change in the automotive industry: 2020 is and stays a challenging year. "Testing" is the word used by Sandro Bottazzo, managing director of Fritz Studer AG and as CSO responsible for Sales, Customer Care and Marketing. "In a situation like this a company should focus on its own strengths. We shouldn't worry about what we can't do but we should talk about our strengths."

So where do these strengths lie? "We have unparalleled knowledge in and around grinding," says Sandro Bottazzo. "Grinding is more than just machining.You have to master all the parameters. If you are in control of all those, then you have mastered "The Art of Grinding." Nothing says more about us than our company motto." That's why STUDER is refocusing on it. "Grinding is an art, which not everyone can master with this degree of precision and quality," explains the CSO.

The Art of Grinding

The new campaign also refers to the world of art. At the Motion Meeting in February 2020 STUDER presented an S31 artistically designed by Swiss artist Ata Bozaci, which will also be shown at future trade fairs and exhibitions. He has also co-designed ads and mailings. "In recent years we have concentrated increasingly on product promotion and are now consciously pursuing an image campaign, despite the current difficult economic environment," explains Sandro Bottazzo. "Ata Bozaci has designed key visuals for STUDER's three fundamental values: Quality, precision and passion.

"We want to make an impression with this campaign and show courage, even in these challenging times."

This courage naturally also stems from the company's successful history, spanning more than 100 years. But it doesn't want to rest on past successes, emphasises the CSO. A large number of projects and investments have already been pushed forward, with the aim of further improving machines and services, as well as company processes and communication.

Fritz Studer AG Tel: 0041 33439 1279
Email: info@studer.com www.studer.com

Welcome to the home of high precision

Your partners in precision
Founders Mike Duignan and Alan Fisher have a wealth of experience and an excellent track record providing specialist support on precision grinders in sales, applications and customer care.

At the heart of the Jones & Shipman Hardinge's management team for the last decade, they ensured customers received quality advice and support from the initial discussions through to the machine acceptance and ongoing services of CNC Machines from Jones and Shipman, Kellenberger, Okamoto, Hauser, Voumard, Tschudin and Hardinge Super Precision customers.

Exclusive representative in UK & Ireland for all Hardinge grinding and super precision products
Hardinge has acquired many iconic globally renowned precision grinding brands including, Kellenberger, Voumard, Hauser, Tschudin and Jones & Shipman.

DF Precision specialises in sales and aftersales support for these CNC machines thanks to its highly experienced team that is ready to support you and your team.

Exclusive distributor of OKAMOTO grinding products in the UK
Founded in Japan in 1935, Okamoto has grown into one of the most well-known global brands for quality precision grinders and CNC machines.

The manufacturer produces almost 2,000 machines a year from its three ISO 9002 and ISO 14001 certified factories. It keeps total control on the manufacturing process, with its own state of the art foundry as well as machine shop and assembly halls.

As the official supplier of **Jones & Shipman spare parts**, DF Precision offers unrivalled expertise and stock levels of mechanical, electrical or electronic parts.

Service engineers will visit your facilities to repair your machines, while repair service or exchange for reconditioned units for certain items is also offered.

Specialist support is also available for Okamoto's extensive range of grinders.

Latest Kellenberger K10 Universal Grinder with easy touch screen programming

Surface and profile grinders of all sizes are complemented by external, internal, universal, rotary table and vertical spindle grinders.

Special offer on preventative maintenance contracts
Proven to increase reliability, let DF Precision help you generate greater profits and improve your manufacturing production flow and improve your productivity and performance by allowing it to schedule preventative maintenance visits to suit your requirements.

A team you can trust
Just ask the customers they have dealt with for many years. In addition to its specialist experience as a precision grinding machinery supplier, DF Precision has a clear focus on customers' needs.

A long-standing track record in the industry with satisfied customers all over the world will be maintain as the transition is made from Jones & Shipman Hardinge to DF Precision Machinery Ltd.

Partners' support and back up is also world class
The companies it represents are global leaders in their field and have built strong reputations through their commitment to offer great products with great customer service. They select their partners carefully and work to create long lasting partnerships to benefit their global customer base.

Latest product launches
The K10, Kellenberger's latest Universal Grinder offers great value. The brand new entry level machine boasts a fantastic price v performance ratio.

The Voumard V1000 Internal Grinder sets new standards in precision and flexibility with up to five axes and new HYDROLIN hydrostatic guideways.

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www.dfpmach.com

STRIVE FOR THE BEST.

Save the date

Agathon Virtual GrindShow on 17 September 2020

Leo Peri in practice

When it comes to handling small inserts with great precision, the Leo Peri is unbeatable!

At our Virtual GrindShow, we will demonstrate a brand new application as a practical example – don't miss it!

Service offer Care 360

Service from one pro to another. The Agathon service concept for current machine models and their previous generation.

Evo Penta in top form

At our Virtual GrindShow, we will be presenting a practical example of what the Evo Penta – our 5-axis grinding center for machining tools with complex geometries – can do.

Do not miss it!
Agathon Virtual GrindShow #2
17 September 2020

AGATHON
SWITZERLAND

sales@agathon.ch | www.agathon.ch

Great news for grinding specialists

Although there has been a general cull of trade exhibitions in Germany, The organisers of GrindTec 2020 have worked extremely hard to position the show to go ahead between 11th and 13th November at the Augsburg Exhibition Centre.

In these difficult times, it is essential that manufacturers and distributors of production grinding and finishing equipment have a platform to present the latest developments to an industry hungry to stay ahead of the game as far as the latest technologies are concerned. Although the number of exhibitors has contracted slightly, there are still over 600 participating companies ready to greet visitors when the doors open on 11th November.

Professor Dr-Ing Wilfried Saxler, general manager of FDPW says: "As the leading trade fair for new technologies in grinding, honing, lapping and polishing, GrindTec will bring the sector together again after a long time. In the direct dialogue between visitors and manufacturers, new perspectives for tool grinding will open up which can lead companies out of the crisis.

"The coronavirus has clearly shown not only to the tool grinding industry that digitalisation, networking and automation are indispensable. Many new business models are currently being created which have enormous economic potential. Creating added value in production technology at the same time in different places in the world is only possible with a modern network economy. Manufacturers of machines and peripheral systems, of process and tool technology have developed answers to these questions, which they will present live on site."

Developments on show will include:
- Hybrid grinding concepts that also integrate other manufacturing technologies
- Additive manufactured flow-optimising cooling lubricant nozzle
- Direct drives in the grinding machine axes to improve dynamic stiffness and accuracy as well as to increase performance
- New 5-axis machine concepts for tool grinding
- Laser processing possibilities of diamond tools or diamond-coated tools

Tool Grinder of the Year 2020

Together with J Schneeberger GmbH and the FDPW Academy, the trade magazine fertigung is looking for the Tool Grinder of the Year at GrindTec 2020. In addition to high technical competence and great craftmanship, an eye for economic efficiency is also requires.

On 11th November in Hall 1, the five finalists will each program a workpiece on one of two Schneeberger Aries NGP grinding machines and machine it live in front of an audience. The overall winner will be announced at GrindTec.

EU lifts travel restrictions at the external borders

From 1st July 2020, travel to the EU from selected third countries is now possible again. This was announced by the EU Council on 30 June 2020. AUMA - Association of the German Trade Fair Industry expressly welcomes these first steps towards lifting travel restrictions from third countries: "This is an important signal for international exhibitors and trade visitors who come to Germany for our trade fairs and another important factor for the success of the trade fair relaunch this autumn," emphasises AUMA managing director Jörn Holtmeier.

The lifting of the travel restrictions decided by the EU affects the following countries: Algeria, Australia, Canada, Georgia, Japan, Montenegro, Morocco, New Zealand, Rwanda, Serbia, South Korea, Thailand, Tunisia, Uruguay and China. The decision is a recommendation to the EU Member States, as the opening and closing of borders remains the responsibility of each EU Member State. As a result, the Federal Government of Germany has decided, initially for eleven states, that unrestricted entry to Germany will be possible from 2nd July 2020. In the case of China, Japan and South Korea, this is subject to reciprocity. Therefore, as soon as these three countries allow EU citizens to enter, the travel restrictions will also be lifted for them without a new decision.

The list of countries for which travel restrictions to the EU can be lifted is regularly reviewed and updated regularly. The most important criterion is that the epidemiological situation in the respective countries is similar to the EU average. A domestic quarantine after entry is therefore in general not necessary.

For more information about GrindTec 2020, contact:

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Email: grindtec@afag.de
www.grindtec.de

There is much more of Ghiringhelli than you can imagine!

In many everyday products that you use, there is our small but significant contribution. We are talking about components, ground “within microns” by our centerless grinding machines. The Rettificatrici Ghiringhelli is aimed at the sectors of automotive, aereospace, motorcycle, electrical tools and tools wherever perfection is required.

GHIRINGHELLI
Centerless Solutions

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UCIMU

Follow us on:

GrindTec 2020
International Trade Fair for Grinding Technology
10 - 13 November - Messe Augsburg - Germany
Hall1 Booth 1038

Walter to unveil two new machines at GrindTec

Walter will be introducing two new machines at the forthcoming GrindTec exhibition and, while full details of the new duo will not be released until the exhibition doors open, it has been announced that one of the new arrivals will be the twin-spindle option for the Helitronic Power 400 tool grinder and for the Helitronic Power Diamond 400 'two-in-one' tool eroding and grinding machine.

The twin-spindle option machines offer 24 kW and can accommodate tools up to 520 mm long and up to 380 mm diameter.

In addition to releasing a number of other tool production and measurement innovations as part of the United Grinding Group display, Walter Ewag UK says Walter will also show the Helicheck Plus tool measuring machine with integrated robot laser marking (after cleaning), while Ewag will have the Laser Line Ultra, Compact Line and Profile Line insert production machines on show.

The Ewag Laser Line Ultra represents state-of-the-art, ultra-short pulse laser machining of all cutting materials and accommodates inserts up to 200 mm diameter and up to 250 mm long, while the Profile Line is targeted at the production of complex insert geometries, including interchangeable cutting inserts and rotationally symmetrical drilling and milling inserts of HSS, carbide, cermet and ceramic.

Meanwhile, the 6-axis Compact Line is designed for grinding (including peripheral grinding) inserts of tungsten carbide, cermet, ceramic, PCBN and PCD.

The machine's traverses in the X, Y and Z axes are 450 mm, 180 mm and 150 mm, respectively, with axis resolution of 0.0001 mm. The 5.5 kW grinding spindle produces 7,000 revs/min.

A 'three-in-one' dressing unit ensures grinding wheel concentricity and high process reproducibility, plus it offers wheel dressing, regeneration and 'crushing' in a single package. Machine usability and effectiveness is also guaranteed by the integrated ProGrind software, and the FANUC control system enables all grinding routines to be programmed quickly and easily via its user-friendly touch-screen panel.

Applying protective chamfers on the inserts' main cutting edges is ensured by the machine's optimised kinematics as well as by the new C-axis. Machine downtime is minimised by the machine's short travel distances and by the integrated 6-axis FANUC robot that offers agile handling and a high degree of flexibility for loading complex inserts.

Laser marking on the Walter Helicheck Plus

Walter Maschinenbau GmbH produces CNC machines for grinding and/or eroding metal, wood and PCD tools and rotationally symmetrical production components.

The production range is supplemented by CNC measuring machines for non-contact complete measurement of complex precision tools and rotationally symmetrical parts with documented accuracy in a single clamping.

Walter's grinding and measuring expertise is incorporated into the development of our own software. It also offers comprehensive "tool machining" services.

Together with its sister company Ewag AG and its broad product range for the production of indexable inserts, including innovative laser machines tools, Walter sees itself as a system and solution provider for tool machining. Walter and Ewag together represent the technology group for tool processing within the larger United Grinding Group.

The United Grinding stand at GrindTec will again provide a major hub of interest, with an impressive range of equipment on show, including the latest version of the Blohm PROFIMAT XT. For further information, contact:

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Tel: 01926 485047
Email: neil.whittingham@walter-machines.de
www.walter-machines.com

HALL 2 - STAND 2055

Ewag's Compact Line

ADVANCED PRODUCTION SOLUTIONS FOR TOOL GRINDING APPLICATIONS

We provide the most advanced technology to the UK's cutting tool industry, offering the best of Europe's grinding and finishing products; all from one UK partner. Our range of high precision machinery is drawn from Europe's leading machine tool manufacturers and features the very latest technological advances in machine tool design and process development.

Life at the cutting edge is never easy and for tool makers the competition is strong and to stay ahead you need to invest in the very best. Rollomatic offers class leading grinding solutions, Magnetfinish brings micron accuracy to cutting edges to improve tool life by up to 400% and Platit enables small to medium sized tool makers to coat their own tools in-house. Talk to us about your tool manufacturing needs.

ROLLOMATIC TOOL GRINDING MACHINES,

BLANK PREP GRINDING MACHINES and LASER MACHINES for PCD Tools,

MAGNETFINISH TOOL EDGE PREP MACHINES,

PLATIT COATING MACHINES and much more

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Advanced Grinding Solutions at GrindTec

Coventry-based Advanced Grinding Solutions (AGS) has eight of its principals exhibiting at this year's Grindtec show.

Comat (**Hall 7 Stand 7091**) is showcasing its range of Superfiltration Systems for all types of machine using neat cutting oil as a coolant. Today, more than 20,000 machine-tools use Comat Filtration Systems, with more than 20,000,000 litres of metalworking oil super-filtered by them every single day. Comat operates globally and has a 30-year history in developing the most advanced filtration systems that are available.

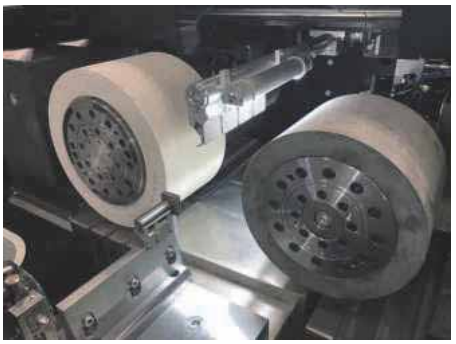
Comat's Superfiltration Technology uses continuously regenerating filtering media (diatomaceous earth, cellulose or other vegetable media), to ensure that particles larger than ≤ 3 µm are removed from cutting fluids and that the fluid is maintained at a stable desired fixed temperature. Oil that is filtered by Comat systems does not need to be replaced and many clients report that they have never changed the oil for up to 20 years, apart from top-ups due to oil loss. AGS has already supplied a number of these units into the UK for grinding applications such as those carried out on Rollomatic grinding machines.

Rollomatic (**Hall 5 Stand 5077**) will be showing its latest range of CNC tool grinding machines such as the new NP50 machine for the grinding of cutting tool blanks. The new design of the workhead, with direct drive, offers more rigidity, finer, and more precise indexing control that is especially useful for applications requiring flat surfaces as well as for non-round punches. The roughing station has been designed to enable different wheel positions with a rotation change from 0° to 10° and 90° in just a few minutes. This innovation offers both a huge savings on set-up times and positions the machine as the most flexible on the market. The two

synchronous spindles make the production process very quiet and their power is increased to 14 kW and allows roughing operations to be carried out on both axes.

Rollomatic's 6-axis 830XW machine is used for manufacturing large diameter cutting tools and has a unique combination of hydrostatic guides and linear motors giving superior surface finishes on milling cutters and drills. This concept provides an exceptionally high degree of rigidity and dampens vibrations that naturally occur during grinding, thereby increasing the life of the grinding wheels and guaranteeing surface finishes and sharp cutting edges that give users a real competitive advantage. Unattended production is an additional process that has been integrated into this machine to allow long-term manufacturing without human intervention. The use of the same oil for the hydrostatic slides, cooling of grinding spindle, and coolant during grinding, allows the machine to be kept at a constant temperature and provides a remarkably high level of thermal stability, both during setup and grinding. All Rollomatic grinding machines benefit from their industry leading three years parts and labour warranty and free software updates for life.

Tschudin (**Hall 7 Stand 7086**) is exhibiting its latest Cube 350 grinding machine, stated as being the world's most compact CNC centreless grinding machine. A feature on all Tschudin machines is their patented movable workrest axis (W-Axis) which allows for additional grinding processes such as the highly efficient multi part grinding of several parts at a time or to split up grinding processes in the same grinding cycle to have both a rough and also a finish grinding operation in one automatic setup. Thanks to the W-axis, the loading and unloading of the workpieces is always outside of the grinding zone, allowing simplified and safe automation or safe manual loading. 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. With the machine base and the spindle blocks made from natural granite, Tschudin is mastering the worst enemy of grinding which is thermal expansion due to heat variances. The Tschudin Cube machine that has a plunge grinding capacity for parts from 0.1 to 20 mm in diameter will also be a central feature on the AGS stand at the forthcoming MACH show.



New to the AGS range of finishing and deburring machines is GPA Innova (**Hall 5 Stand 5026**). GPA has introduced the world's first dry electropolishing process, DLyte, that does not use any liquid as the electrolyte. This is a patented and unique one step automated process for grinding and polishing metals by ion transport using free solid bodies.

DLyte machines are used for polishing steel and stainless-steel, cobalt chrome, titanium, aluminum, nickel and alloys for the medical, aerospace, automotive and other industries. Unlike traditional polishing methods, the DLyte system obtains consistent finishes whilst avoiding producing any marks on the surface of

components and is able to process complex geometries without generating micro scratches on the surface. DLyte respects the tolerances of the workpiece, delivering a mirror finish without affecting part geometry. Typical applications for this process include the polishing of cutting tools, all kind of medical parts such as artificial knee joints and hip joints, and aerospace parts such as aeroengine blades.

Grinding of course would not be easy without the best grinding wheels and Krebs & Riedel will be highlighting its large range of grinding wheels in **Hall 2 Stand 2031**. Krebs & Riedel is one of the leading German abrasives manufacturers with over 250 employees and an annual turnover of 33 million euros. An export share of about 45 percent shows its international orientation. The wide product range

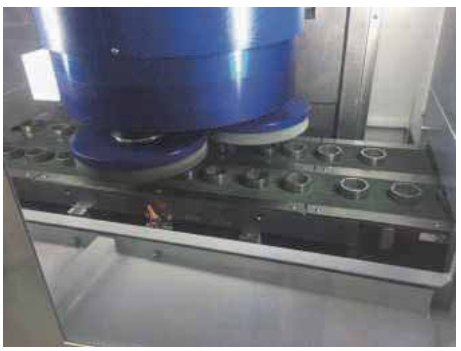
includes corundum and silicon carbide wheels in ceramic and synthetic resin bonds for most industrial grinding applications up to 900 mm outside diameter. Diamond and CBN grinding wheels in ceramic bonds with a working speed of up to 200m/s for internal, external and special grinding processes are also offered.

Such has been the success that Advanced Grinding Solutions had in the UK with the Krebs & Riedel wheels that it now holds over £75,000 worth of wheels in stock for the same day/next day delivery to key UK customers and this stockholding is growing as more and more engineering companies discover the advantages in improved part quality and the cost savings that the Krebs wheels brings to them.

In **Hall 4 Stand 4037**, FLP will be exhibiting several fine grinding and lapping machines whose range includes both twin-wheel double-sided CNC lapping machines and also single-sided lapping machines. The size of machines ranges from the most basic of 400 mm in diameter having three working stations up to the world's largest 100 tonne 4 m diameter monsters. FLP holds over £2.5 million worth of lapping consumables in stock and offers

end users of all types of lapping machine the largest range of wear parts and consumables. The range is vast and includes items such as: lapping and polishing oils; fine classified silicon carbide; boron carbide; special fused aluminium lapping powders; lapping and polishing fluids in water-derived concentrates with integrated rust protection; honing oils for machining steel, non-ferrous metals, hard metals and ceramic; diamond sprays, suspensions, powders and pastes with micro-grains of various specifications and grades from 0.25 µm up to 45 µm.

Gerber is showing four deburring machines in **Hall 1 Stand 1020**: the BP Smart, BS Power, BP MX and the new CompactPolish machine. The technique of brush honing hard materials has been pioneered by Gerber for more than 40



years. The Gerber BP-M machines use advanced part dedicated brushes which result in a repeatable material erosion during the honing/polishing process. For simple shapes, nylon brushes impregnated with abrasive grit are used. A different approach is used for parts with more complicated shapes or with higher requirements on the quality of the surface polishing. Here brushes are made from natural materials and a special diamond paste is applied. Both single-sided and double-sided deburring is catered for from simple stand-alone machines to ones with full automation.

In **Hall 3 Stand 3094** you will find Platit, a leading manufacturer of highly advanced coating machines that are based on plasma generating PVD technology (Physical Vapour Deposition). One of the main applications for Platit coating machines is the coating (usually TiN, TiCN, CrTin, etc) of cutting tools (end mills, form tools, and drills), also inserts, saw blades, hobs and broaches. Here Platit leads the way in offering cost-effective solutions that means that tool manufacturers can now easily coat their own tools and cutters instead of relying

upon expensive subcontract solutions. Platit does much more than just building coating machines, however. It is constantly developing new coatings for its customers' needs and offers a full consultancy service for end users to ensure that they are using the optimum coating for their application. The machines themselves are very user friendly and are extremely versatile.

AGS will have staff on hand throughout the Grindtec show to meet UK engineers and more information is available at **www.advancedgrindingsolutions.co.uk**

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From conventional to high speed grinding, in one solution

by Claudio Tacchella

The Italian company Rettificatrici Ghiringhelli - headquarters in Luino (VA) - presents at the GrindTec exhibition - Stand 1038 – Hall 1, a special machine configuration of the famous APG range which was designed for the ideal use of the centerless grinding process at high cutting speed up to 120 m/s with CBN wheels for companies and industries with requirements for medium or large production volumes.

"Our centerless grinding machines, - says Mrs. Patrizia Ghiringhelli, Joint Managing Director of the Rettificatrici Ghiringhelli -, are customized according to the customer's "technical requirements", with a wide and varied range of components and production problems to solve. In this context the grinding process at high cutting speed finds countless areas of application where the investment into suitable machines can turn out to be extremely profitable. Until recently the market was showing a certain skepticism towards the high-speed grinding. Today the approach to this technology is quite different, as it is a tried and tested process. Following these analyses, we felt the time had come for us as well to make it available. This new machine configuration was created to complete the actual APG series, by expanding the range of modern and technologically advanced centerless grinding solutions."

On the new machine the grinding wheel head is equipped with electrospindle on super precision bearings, developed in partnership with the Italian company Capellini srl based in Podenzano (PC). Drive by integrated coaxial asynchronous motor with 55 kW power and torque of 240 Nm and liquid cooling in autonomous circuit. Wheels up to 500 mm Ø x 250 mm width with a peripheral speed of 120 m/s can be mounted. The wheel balancing is automatic and integrated into the spindle through a balancing unit accomplished by the Italian company Balance System in Pessano con Bornago (MI). In particular the balancing head has integrated rotation sensors, AE acoustic emission for wheel-piece contact and wheel-diamond and allows a wheel pre-balancing through a guided procedure. The engineers in Ghiringhelli have designed the lubrication cooling system with particular attention to the feeding nozzles of the liquid in the area wheel-piece. The control wheel head with spindle on super precision bearings accomodates wheels of Ø 305 mm x L 250 mm for a torque of 11 Nm. The control wheel head can be inclined by +/- 5°. The grinding wheel dressing is through CNC with a dressing orthogonal group (axes X/Y), as well as for the control wheel (axes X1/Y1). The machine dynamics develops with 6 basic axes CNC controlled and the whole architecture is based on a solid mineral casting frame, 100% recyclable, designed with CAD 3D and FEM engineered. In this configuration the machine can grind pieces from Ø 1,5 to 70 mm. The CNC is equipped with Siemens 840D SL and, as an option, the brand new digital native Sinumerik-ONE which allows the creation of a Siemens digital twin (Digital Twin).

The new Ghiringhelli APG is designed for the optimal use of the centerless grinding process at high cutting speed up to 120 m/s

"The new CNC Sinumerik-ONE, digital-native – continues Patrizia Ghiringhelli -, allows to plan identical solutions to those to be physically accomplished and to simulate their functioning. The users of the grinding machine can this way optimize the set-up and improve the performances during production, maintenance, piece programming, automation and all technological cycles by becoming more flexible and by reducing the time-to-market".

The new APG adopts the innovative communication protocol Siemens IO-Link and all the software functions, automation included, are joined to those of the machine through the exclusive CNC interface which belongs to Ghiringhelli.

"The high speed wheel structure, - concludes Patrizia Ghiringhelli -, is not only available for new supplies, but also for those who already have a conventional APG centerless grinding machine at their disposal and wish to evaluate its possible transformation with us. This big opportunity is feasible thanks to the careful planning developed according to our principles of modularity and standardisation that we adopt on all our creations."

A potential which offers the user the transition to a technogical segment of higher level. The new APG allows high customization for very precise "turnkey" grinding solutions. It can find application in various fields such as automotive, bicycles/motorcycle, aerospace, power tools/tooling, bearings, electrical motors, textile and precision mechanics.

Rettificatrici Ghiringhelli S.p.A Tel 0039 033254 3411
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HALL 1 - STAND 1038

The Ghiringhelli centerless grinding machines can be equipped with automatic piece feeding systems and with post-process measuring systems used for machine correction

A clear vision for the future

Haas Schleifmaschinen has once again launched a whole series of highlights and innovations this year. Marie-Sophie Maier-Wember points out: "At Haas Schleifmaschinen we not only have a clear vision of the future of manufacturing complex workpieces, we have a concrete plan. This makes the future a calculable, strategically useful factor for us. Along the way, we define milestones that we can adapt promptly, so that we always remain open and flexible for the demanding needs of our customers."

"The focus here is on changing process control through an automated compensation process. Thus, systematic and machine-specific deviations are determined by tactile measurement on the workpiece, on a coordinate measuring machine during the running process and constantly transmitted to the Multigrind® Horizon software. Our software has a large number of compensation functions that complement each other perfectly. In this way, all dimensional deviations can be compensated with µm-accuracy. Without compensation of all process factors, the achievable tolerance would be 4 - 5 µm. With compensation grinding, 0.6 µm can achieved.

"Basically, we do not actually sell grinding machines, we provide our customers with a turnkey solution tailored to their requirements. This typically includes a Haas Multigrind grinding machine. The Multigrind Horizon software is always part of the solution. The highly flexible grinding machines from the Multigrind series are transformed into high-tech tools by the software solutions. Only through this unique combination, are we in the position to offer our customers maximum added value," says Marie-Sophie Maier-Wember, describing the benefits that the Trossingen-based company offers every customer.

A range of selected applications can be viewed at the company's WebExpo at **www.multigrind.com** including the following:

Skiving tool: own calculation model for maximum precision

The question: "What characteristics should the gear have?" becomes the starting point of the manufacturing strategy. The motion sequences in the gear and the relative speed of the flanks define the future geometry. Haas calculates the exact path resulting from the movement of the gear wheel. To generate this precision, the alignment of the grinding wheel must be accurate to a ten thousandth of a degree. The results of the permanent re-measurement with subsequent compensation of errors are the basis for the finest correction of the grinding path. This automatic process carried out completely in the sense of a closed loop.

Femoral implants: saving costs through precision finishing

For manufacturers of box implants, this is doubly interesting: firstly, because Haas has made complete machining possible in one clamping on the ultra-compact Multigrind CU. Secondly, because the finishing of the plane-parallel side walls in the box is done by machine for the first time with finishing quality and without any manual finishing. The function of the artificial knee joint is significantly improved.

Profile dressing roll: the splitting of the µm

A ½-µm tolerance on the workpiece - that is record-breaking. The more precise the profile dressing roll, the more accurate the grinding wheel and the more accurate the work piece. Compensation grinding compensates all form deviations to the nearest µm. Haas Schleifmaschinen set new standards for the entire grinding industry in the unmanned production of profile rolls in one clamping.

Rotors: the future today for more efficiency

"Showing what works" - Haas presents a maximum complex rotor that no one else dares to grind. Produced fully automated and in the spirit of industry 4.0, it is a real proof of performance for complex compressors, vacuum pumps, hydraulic pumps, etc. The Haas Multigrind CB handles the large volume removal without any problems, even with extremely robust materials.

Bevel gear: prospects for small series and special products

Thanks to gear and cylindrical grinding in just one work step, maximum flexibility and precision is possible, with short throughput times, lower tool costs and minimum setup time. Suitable for circular arc or cycloid geometries, bevel gears from 10 mm to 150 mm in quality two and one produced in

a closed loop, this is ideal for very small series from batch size one to 100 and for special products, prototypes or test setups.

Another new product that Haas Schleifmaschinen has successfully introduced to the market this year is the Multigrind Styx visualisation software. "Haas Schleifmaschinen is the first machine manufacturer ever to use ray tracing to display complex workpieces with unlimited precision," explains Marie-Sophie Maier-Wember.

Haas Schleifmaschinen has once again gone its own way here, because standard market simulations based on triangulation, which is associated with resolution-related deficits, among other things.

"Simulation results based on such approaches are associated with corresponding inaccuracies, which is not a satisfactory situation for a manufacturer of universal grinding machines capable of splitting the µm," continues Marie-Sophie Maier-Wember "This is why Haas Schleifmaschinen's visualisation software is designed for use in the high-precision sector. After all, what the Multigrind Styx shows before the machine is started is what the blank looks like after the various machining operations in the machine.

"We are getting unreservedly positive feedback from our customers," says Marie-Sophie Maier-Wember. "The central advantages of Multigrind Styx have been clearly recognised by our customers. By showing the machining processes in advance, i.e. looking to the future, the costs for downstream finishing are reduced considerably, as deficiencies in the surface finish become visible before the blank is ground."

All these innovations allow a first foretaste of the upcoming GrindTec in November.

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HALL 2 - STAND 2002

The best landing gear grinding solutions

by Claudio Tacchella

Although the Covid-19 health emergency tests the entire sector, the international aviation industry, direct and indirect EOM and certified subcontractors, continues the important technological developments with innovations for all components and manufacturing processes used for the construction of increasingly efficient aircraft.

For machine tool suppliers, in particular for finishing machines such as grinding machines, aerospace also means working very expensive single pieces, following strict production procedures with special work cycles that guarantee traceability and above all "zero defects" on the final pieces; the aerospace does not admit errors!

In this context, among the manufacturers of cylindrical grinders accredited for the aerospace industry, the Italian AZ SpA of Thiene (VI) has been able to achieve worldwide leadership success thanks to the high quality and performance levels of its products, the result of a high professionalism and engineering creativity able to grasp and often anticipate market demands. The aeronautics and aerospace sector have AZ SpA, a technological partner capable of offering numerous specific and very flexible grinding solutions with a high innovative content.

AZ has an impressive range of grinding solutions designed specifically for the aerospace industry called "AZ Aerospace" for the manufacture and maintenance of components of aircraft engines and landing gear. AZ grinding machines are all customizable, energy efficient, safe, reliable and comply with Industry 4.0 requirements.

The GSB range for internal landing gear grinding

The numerous lines available are developed with the range AKP for external landing gear grinding machines with gap bed, GSB for internal landing gear grinding machines, LBC for landing gear orbital grinding machines for external and internal diameters, RU and RUG for universal grinding machines for external and internal diameters.

Among the numerous high-precision grinding solutions of AZ SpA, the new AKP and GSB ranges have recently been renewed and made even more flexible and performing.

The AKP range for external grinding and GSB range for internal grinding have been designed as specific grinding machines for the landing gear of aircraft of various sizes and types.

On the AKP range, the presence of the gap bed on the base of the machine allows the complete machining of the components that require a large rotation diameter.

In fact, the gap bed allows a max

The AZ-Aerospace line is a range of special grinding machines for the aerospace industry

swing on the gap up to 3,600 mm with a swing over table up to 1,200 mm for workpiece length up to 5,000 mm.

On the GSB range the grinding wheel moves on base by ball screw system and linear guideway allowing internal grinding process, face grinding and taper grinding.

The maximum internal grinding diameter is up to 350 mm for workpiece length up to 3,000 mm. Common to both range, the machine base has been designed with FEM analysis and is made of thermally stabilized cast iron that guarantee an exceptional absorption of vibrations, great machine rigidity, stiffness and high dynamic performance.

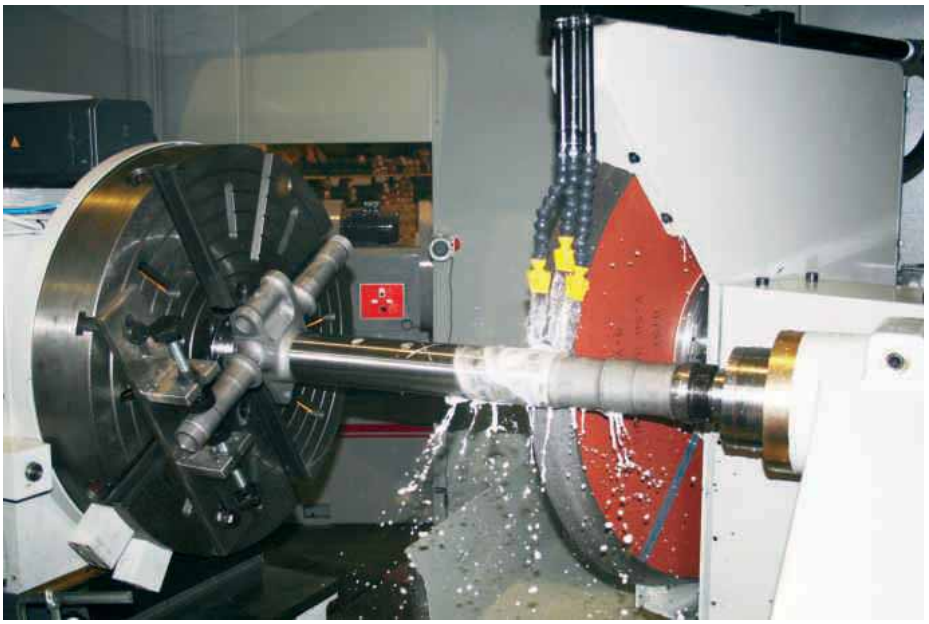
The grinding wheelhead, mounted on a rigid structure, is available in different configurations, straight, angular with manual or automatic B-Axis rotation which is driven by an integrated torque motor and can be equipped with a plurality of spindles for external and internal grinding processes. Silicon carbide, corundum, CBN and diamond grinding wheels can be used which allow to grind all aerospace materials, metals and their alloys including chromium and in particular those subjected to the most innovative systems for thermal spray techniques, such us H.V.O.F. (High Velocity Oxygen Fuel).

Based on the type of machine chosen, the headstock is designed to use different clamping systems in accordance with the specific workpiece. The headstock can swivel manually or automatically and uses Morse cone or Asa centering system. The tailstock is equipped with conicity (taper) adjustment with continuous control of the force between centers. Numerous integrated grinding wheel dresser systems are available with diamond flarin cup wheel, diamond electroplated wheel and automatic fixed points or with single point diamond for internal wheel dresser.

The grinding process has some functions to give to the operator few automatic and safe working cycle such us Electronically variable spindle speed, GAP control, Dressing control, CRASH control and control of diameters from CNC. There are also innovative solutions for factory integration. Wikicam is a monitoring system that allows to control remotely some parameters of the CNC machine. There is also a live video streaming solution built-in, to monitor what the machine is doing in real-time.

The connection to the builder's headquarter is made by a high-strength secure encryption algorithm, using a VPN. The machine can be supplied with different measurement systems like absolute in-process measuring, in-process diameter measuring with fork and external measuring with double touch. Also motors, drives, as well as machine mechanisms and applied CNCs, are selected among the best brands in the world.

The design creativity of AZ allows the creation of product lines, like the new AKP and GSB grinding machines, among the most sophisticated on the market today. AZ SpA is exhibitng at the German Grindtec fair in Augsburg, November 10-13 in Hall 5 Stand 5094 where AZ engineers are available to illustrate all the technical characteristics and provide all information on the new AZ-Aerospace range.



AZ-Aerospace range. The machines produced by AZ perform the most advanced mechatronics solutions for landing gear grinding

The GSB machine is designed for internal grinding process, face grinding and taper grinding

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GrindTec: HALL 5 - STAND 5094

FARO provides precision 'when the heat is on'

Alloy Heat Treatment (AHT) was established in 1974, becoming the first UK company dedicated to the heat treatment of aluminium alloys. To satisfy ever increasing demands for its wide range of services, the Dudley, West Midlands-based subcontractor has continuously expanded its facilities, invested in the best available heat treatment plant and increased its skilled workforce.

Regarded as a technical leader in its chosen field, the busy company now operates 19 furnaces that provide the capacity to keep pace with customer demand. AHT offers heat treatment of a wide variety of aluminium products, from sheet metal to large sand castings, ranging in weight from just a few grams to over 2.5 tonnes.

The NADCAP, AS 9100 accredited business, has achieved preferred supplier status with many aerospace primes and enjoys long term relationships with companies such as Rolls Royce, BAe and Airbus. In addition, AHT has assisted many automotive tier one and sub-tier suppliers in their adoption of aluminium in areas such as the integration of lightweight engine and suspension components. The company also enjoys a strong presence within the challenging motorsport sector and works with teams such as Mercedes and McLaren.

To complement its heat-treatment processes, AHT offers services such as solvent degreasing and dye-penetrant flaw detection. Also, as unwanted distortions can occur in intricate aluminium products due to the rapid heat transfer from the quenching process the business operates a setting department that removes distortion in the treated condition whilst products remain ductile. To help further increase AHT's setting department precision capabilities and to speed up the throughput of its important work, an advanced Quantum E ScanArm was recently purchased from FARO UK.

Alloy Heat Treatment director, Ian Perks explains: "Although all at AHT are committed to providing an efficient service to our clients and to remaining commercially competitive, the quality of the services that we provide and the premium standard of the heat treated components we deliver to our customers, are of paramount importance to us.

"As a vital aspect of our strict quality regime, we perform regular internal audits to ensure that we continually comply with the requirements of AS 9100: Rev D (BS EN 9100:2018) incorporating BS EN ISO 9001:2015. We also use the data generated by our audits as the basis for making improvement to our quality management system.

"In addition to frequently investing in the best possible heat treatment plant, given the nature of our customers and the challenging technical demands they place on us, we also believe in regularly updating

our important material testing and dimensional quality control equipment.

"Owing to the speed and precision a ScanArm type device could provide, for many years we have felt that such an advanced inspection aid had a part to play in our organisation. Therefore, as our workload grew, recently we finally committed to placing an order. As we were aware of FARO's reputation for innovation and for being the market leader in this technology, we didn't consider purchasing any other brand of laser scanner.

"After considering several FARO models, due to its speed, ease of use and impressive accuracy specification, we chose the Quantum E ScanArm. Given that it will be used in a working environment, it helped our decision that the Quantum E has an impressive IP rating and is resistant to the ingress of dust and fluids.

"As this is our first FARO ScanArm, we sent two of our operators on a FARO course which enabled them to quickly pick-up the fundamental of the FARO Quantum E and its related software. As our new FaroArm is now in daily use, our two trained staff members have become competent in the ScanArm's use, and they will soon be training a further five members of staff in its use.

"A vitally important aspect of our services is our first-class setting department, here, our skilled operators remove distortion from components following the quenching process. In addition to improving our precision capabilities in this area, our new Quantum E has considerably speeded-up these processes. The scans made by our new FARO equipment enables precise corrections to be made to components, then by re-scanning components, our staff are able to ensure that they adhere to customers' requirements. Also, as our setting fixtures are unable to detect the distortions that occur in a few of our parts, through use of our new FARO ScanArm we can now guarantee that these parts will machine successfully."

When a FARO Laser Line Probe option is attached to a FaroArm, it becomes a super-efficient ScanArm, capable of delivering up to a remarkable 600K metrology points per second. AHT specified a FARO Quantum E ScanArm fitted with a Prizm Colour Laser Line Probe, the world's only colour laser line probe designed for use with portable measurement arms. When

used in combination with the Prizm Laser Line Probe, the Quantum E delivers outstanding levels of performance across all applications that require accurate colour point cloud data capture.

Matching the Quantum E's impressive speed of operation, the ScanArm's sophisticated new electronic design guarantees optimal wireless operation for scanning and probing, allowing gathered data to be transmitted via high-speed wireless methods across the entire manufacturing floor.

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How to get up to six times faster production - even from a dinosaur

In-process gauging increases the profitability of your old grinder

When it comes to machining, efficiency is a recurrent topic in workshops, industrial magazines and at exhibitions. Many technology providers in the machine tool industry are constantly investing to help the optimisation of machining processes and every year there is always something new to look at. However, these technical 'advances' are sometimes minimal, and with a questionable return on investment (ROI).

Francesco D'Alessandro is a business manager with over two decades of experience in industrial machines with a specific focus on spindle monitoring systems for machine tools and process control systems for grinders. Here he talks about one of the most effective ways to increase the profitability of your machine:

"As we know, grinding is often one of the final steps of the machining process for a large variety of workpieces. In fact, by the time a production part reaches a grinding machine, generally speaking that part has already been subject to significant machining and therefore has added value. The workpiece that goes to a cylindrical grinder, for instance, has likely previously spent time on a lathe and on a machining centre too. If something should happen during the grinding process that results in the part being scrapped, then the entirety of the prior machining investment is lost, alongside the grinding time. Consequently, a critical requirement of grinding is to safeguard the value that has already been added to the part."

This is how Francesco starts the discussion, by looking at the big picture of a typical journey of a part in the metal cutting sector. Being a former mechanical design engineer for 13 years before transitioning into business development roles in 2012, he provides a down-to-earth view on just how high the stakes are with today's grinding processes. Manufacturers of machines know this trend very well when delivering new equipment. Yet, the problem is that, although many 'legacy' machines operating for 20 plus years are still running and are in good shape, they might not be able to achieve the new key performance indicators (KPI). Now the fundamental challenging question is not only how to maintain high production rates no matter what, but by what means can we optimise the grinding stage with existing machine tools so that useful seconds per part may be gained, without compromising the quality.

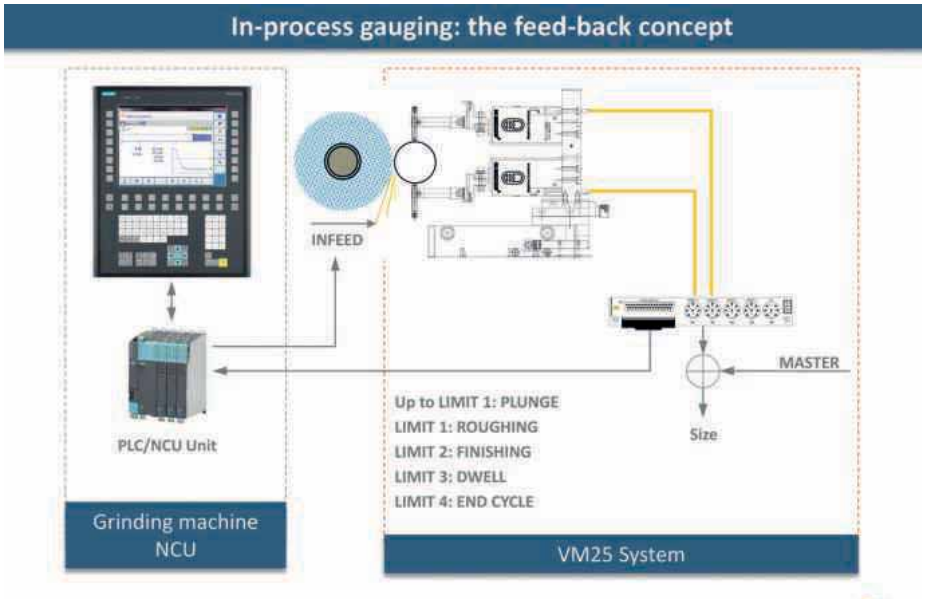
As he explains: "In grinding, small details can have a huge impact on the overall performance of the machining process, whether we are talking about the cycle time, dimensional tolerance, or roughness of parts. Everything depends on microns, which in turn rely on both the machine and the operators. There are processes where technology can help and others that rely solely on manual operations. Here, mistakes can be made and there is a compelling argument to install an in-process gauging system."

Francesco W D'Alessandro, expert in spindle monitoring, grinding processes, and balancing machines, talks about one of the most effective ways to maximise the profitability of grinding machines

In-process gauging is an ancillary system that can measure the part while it is being ground and, in real-time, automatically control the in-feed of the grinding wheel so that every part produced by the machine is in tolerance according to the manufacturing specifications (see photo top left on next page). It provides a 100 percent production validation check that can even automatically compensate for wear on the grinding wheel. Due to the harsh machining environment found in the grinding process, the gauging operation is performed with the gauge's fingers in physical contact with the workpiece. This is the only way to get a reliable diameter measurement in such conditions. Over the decades this solution has increased in reliability and robustness and today just a few vendors, such as Balance Systems, are recognised as offering great solutions.

The cycle time for a mid-size part on regular OD manual grinders can be around three to six minutes. With this type of machine tool, the dimensional accuracy of the part is subject to human error as the operator has to measure the diameter of the workpiece, calculate the residual overstock, and then proceed with the next machining step. In order to reduce the risk of scrapping any parts, operators tend to be conservative and remove less material than necessary. So, a vicious loop that increases the cycle time is established which, in turn, increases the labour costs. By using an in-process gauging system, this process is done automatically by the machine with a ramp-up of production volume achieved.

"The investment for these systems starts from 6,000 US dollars up to tens of



The conceptual scheme of an in-process gauging system (photo courtesy of Balance Systems)

thousands, depending on the complexity of the part and the level of automation. My teams in North America and the UK and I are getting more interest for these solutions every year, especially for older machine tools. Just to give you an idea, we recently turned an almost 30-year-old machine into a semi-automatic piece of equipment capable of achieving a 60 second cycle time (see photo bottom right). We used a VM25 amplifier with a diametral-axial flagging system TG200, all designed and manufactured by Balance Systems. The ballpark investment was around 20K USD, with a final benefit in terms of productivity that was straightforward, especially from a financial point of view. With this electronic system, users can also carry out shape analysis of every part without removing it from the machine," explains Francesco.

According to the old adage 'you get what you pay for', behind every improvement there is always a price to pay. As well as the initial investment to source and install the equipment, there are other costs to consider. The training of the personnel on using this kind of equipment is the first one, which includes: how to handle the change-over between different production batches, the periodic cleaning of the gauges, and also the handling of unpredictable (hopefully rare) system crashes that typically happen during the loading/unloading of the parts or due to incorrect interpolation of the axes.

"The implementation of a gauging system like this, in my experience, poses a challenge for both sides. The end-user must adapt the internal SOP [Standard Operating Procedure], matching the requirements of the new gauges. All machinists and maintenance staff need to be informed and trained about the new equipment, how to operate and care for it."

"For the supplier, the challenge is the installation of a robust in-process gauging system, including the integration of the signals into the machine tool. There can be a broad range of technological 'hurdles' to overcome in the field. So, I strongly recommend only approaching experts with a proven track record in these applications," concludes Francesco.

It is important to note that in-process gauging systems cannot be installed in every type of grinding machine. For example, centreless and double-disc machines have obvious limitations due to their machining concept, making it very difficult (in some cases impossible) to locate an external element, such as the gauges, in contact with the part while it is machined. However, Francesco points out that there are solutions called 'pre-process' and 'post-process' gauging systems that allow automating the grinding cycle even on these machines, making the challenging KPIs of today's manufacturing world achievable.

Looking at the numbers shared above, it's clear to see how it would be worth investing in such a solution: A six minute versus one minute cycle time, without and with an in-process gauging system respectively, is a very powerful argument. Whether you need to produce medium volume batches or extended volume runs, the ROI of an in-process gauging system is extremely attractive. What could your company do with six times the production capacity?

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Case study: an almost 30-year old grinding machine increased productivity by six times with just 20K US dollar ballpark investment

Master and Micromatic offer special discounts to celebrate four year partnership

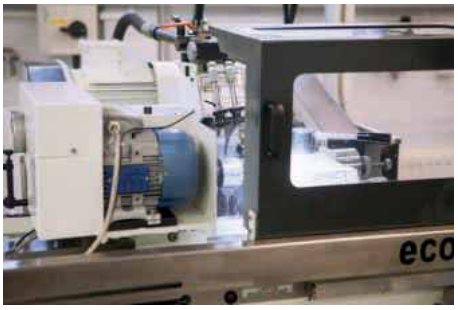
To celebrate four years of partnership, Master Abrasives and Micromatic Grinding Technologies have teamed up to offer special discounts on grinding machines.

In this celebratory special offer for UK customers, the company is giving a 10 percent discount on hydraulic-powered machinery and 15 percent discount on CNC grinding machines from 20th July through August and September. Two machines are stocked and available for quick delivery from Master Abrasives' facility in Northamptonshire: the eco 200 cylindrical grinder and the PLUTO-18 CNC grinder.

As the UK representative of Micromatic Grinding Technologies, Master Abrasives introduced their cylindrical, centreless and special purpose machinery in 2016 to complete their solutions for precision grinding applications. The first machine installed in Master Abrasives demonstration area was an eco 200 grinding machine, a cylindrical grinding machine ideal for small precision components up to 200 mm diameter in low to medium production batches. This model has the advantage of a small footprint, is low cost and can hold tight tolerances.

Fast forward to now, Micromatic grinding machines are operating in many engineering firms throughout the country. The eco 200 was the first machine to be installed at Earlsdon Technology, who were looking for a cost-effective means to provide the in-house service of customised tooling.

The PLUTO-18 CNC grinder available from stock and for demonstration at Master Abrasives facility in Daventry



The eco 200 U grinding machine available from stock and for demonstration at Master Abrasives facility in Daventry

Master Abrasives has also worked with Border Ballistics Technologies, who were increasing their production output of gunsmith tooling. A leading manufacturer of tooling components, Boneham and Turner, replaced two grinding machines with the eco 200 U as they celebrated their centenary year. Cengar Air Saws production department introduced their Micromatic grinding machine to produce parts for tools and improve delivery demands.

Managing director Paul Batson comments: "Since this partnership began, we've seen many milestones in the company. We have celebrated 50 years of trading, set up a dedicated applications engineering team and started our own initiative in video marketing. We're delighted to be partnered with Micromatic who have similar plans for growth and an excellent reputation for their social responsibility activities, especially in recent times with their efforts to support their local customers and community."

At MACH 2018, Master Abrasives exhibited for the first time in several years with the Micromatic eco 200 machine in the spotlight on their stand. The event was key to increasing awareness of the new name of machinery available to the UK and it led to new opportunities. At MACH 2021, it will be exhibiting an extended range of machinery with the CNC machine, PLUTO-18, as the highlight. This machine focuses on compactness and high-performance.

Other future plans include producing videos to show the machines in operation at Master Abrasives facility. Further videos filmed by the Micromatic Grinding Technologies team are already available to view on Master Abrasives' YouTube channel.

Paul Batson concludes, "We're confident that we can provide the best of precision grinding technology in one place. With our partner's innovative products, our own range of Master precision grinding products and a dedicated, knowledgeable team to support customers, we're proud to offer a first-rate service and provide solutions for industry."

Master Abrasives is an independently owned company providing solutions for industry with a complete range of abrasives, power tools, tool services and machinery

Kapil Dhand, managing director of Micromatic Grinding Technologies Pvt Ltd and Paul Batson, managing director of Master Abrasives

and equipment. The Daventry-based company has built an enviable reputation for quality and service that is as strong today as it was 50 years ago. The well-known trademark of 'Master' represents the high-quality product range and services offered by the company worldwide.

Micromatic Grinding Technologies, part of the internationally active Ace Micromatic group, manufactures a wide range of grinders in CNC, PLC and Hydraulic versions from its three plants in Ghaziabad near New Delhi. This includes cylindrical, centreless and special purpose build machines.

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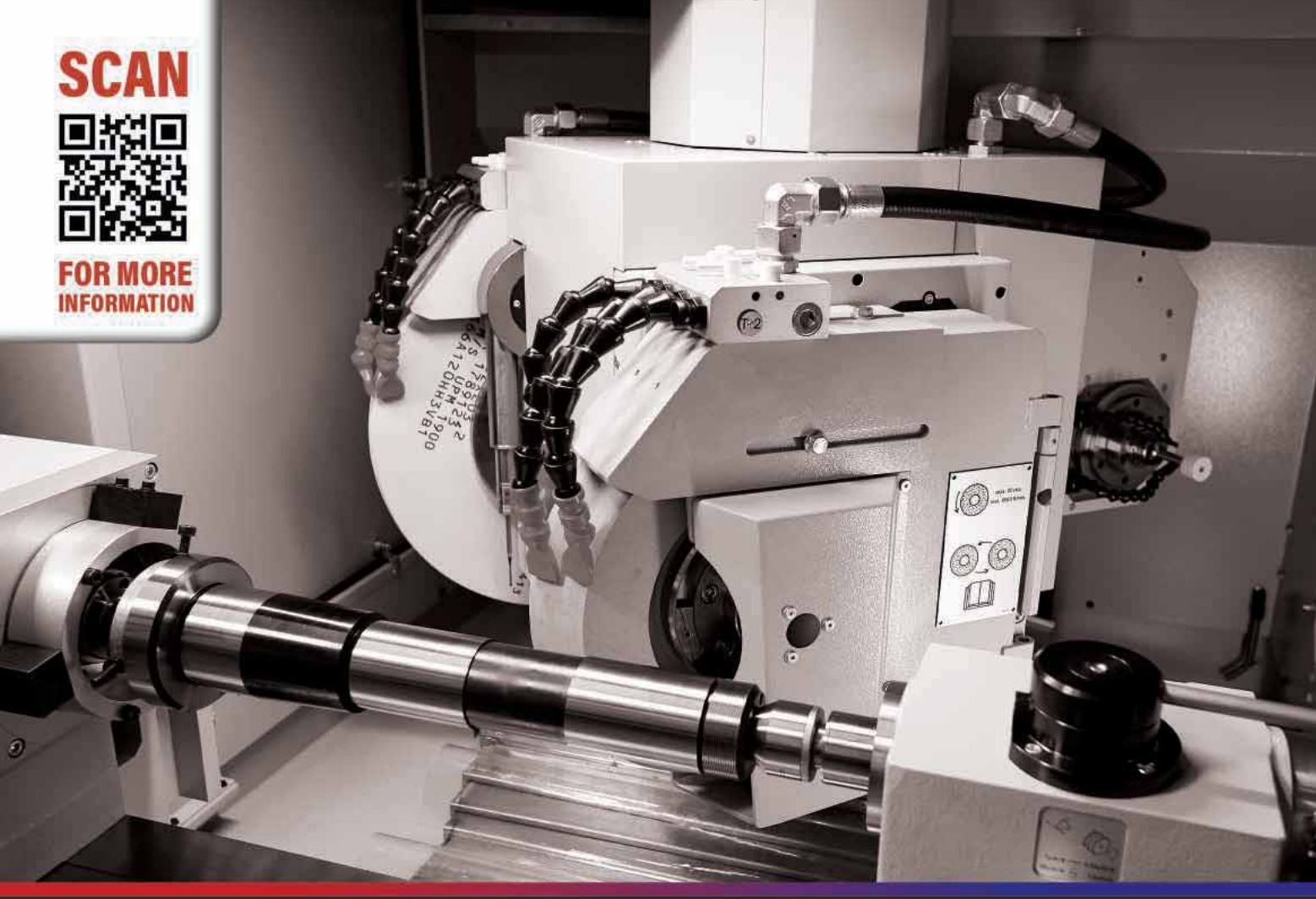
SCAN

FOR MORE INFORMATION



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Faster cycles for crankshafts

Nagel reduces idle time for crankshaft superfinishing machines

The lower the bearing friction in a piston engine, the higher its efficiency. All things considered, this also means lower fuel consumption and CO_2 emissions respectively. The focus is on the crankshaft, among other things. Superfinishing the bearings of these key components is already a standard process today. Nagel has optimised the interplay of the process steps necessary for this on finishing machines of the UF series. This reduces the cycle times considerably

Crankshafts for combustion engines are manufactured in large quantities. All manufacturing processes, whether forming, rough or fine machining, are subject to high demands when it comes to productivity. The focus for the launch of the dFlex finishing tools was on optimisation of the machining time. As a result, the machines in the UF series from Nagel finish a standard crankshaft within around 20 seconds. This is already an excellent value. The idle times, caused by clamping, adjustment or traversing processes, sometimes take twice as much time. This applies above all when a machine concept enables complete machining. This is the case for machines from the Nürtingen-based finishing experts. Aside from the main and connecting rod bearings, shaft seats and flange bearings can be finished and oil holes can also be deburred.

Consequently, the bigger set screws in the idle time range further improve productivity. "We scrutinised all the processes on our UF series machines and developed a new control concept", reports Marcel Bosch, manager of process development and service at Nagel. Subsequent processes can now already be started when the finishing arms open from the interference contour of the crank shaft.

Marcel Bosch, manager of process development and service at Nagel Maschinen- und Werkzeugfabrik GmbH, Nürtingen: It was possible to reduce the idle times of the UF series superfinishing machines by 30 percent, making it possible to model a 2000 unit platform

Improved positioning windows of the NC axes results in a faster programme run. Parallelisation of the clamping processes of the tailstock and headstock also save valuable seconds. If the traverse path is in a given tolerance window, then the axis is immediately accelerated to its maximum value. Last but not least, more precise control of the NC drives boosts the dynamics.

"Thanks to these measures, we have been able to reduce idle times by 30 percent," summarises Marcel Bosch. If the quality requirements of the car manufacturers increase and a longer finishing time is necessary, this is compensated for by the shortened idle times so that the original cycle times are maintained. All things considered, a crankshaft with the current quality requirements only remains in the machine for 43 seconds. Marcel Bosch continues: "In light of the usual cycle times in the automotive industry, a 2000 unit platform, i.e. 2,000 crankshafts per day, can be modelled by a single machine tool. The achievable Rz val-ues are 0.5 µm, taking pre-machining that is typical for the series into consideration. In combination with the 2nd generation of our dFlex finishing tools, material removal of 8 µm on the diameter is possible.

Importantly, the aspects of quality and process reliability remain untouched by the optimisations and are at the usual level. This is shown by the results for connecting rod bearings, for example. They are the actual challenge when finishing crankshafts, because they rotate eccentrically around the shaft axis. The finishing arms must follow the bearings. This generally results in different acceleration forces that counteract the clamping forces of the finishing tools. In the worst case, this results in different surface qualities over the perimeter of the bearings.

The current dFlex finishing tools ensure minimised machining times and high process reliability on the superfinishing machines from Nagel

Often used for machining crankshafts, the UF10 plunge-cut superfinishing machine UF10 from Nagel. The machines allow complete machining, which means oil seal bearings, journal bearings and flange bearings are finished in addition to the main and connecting rod bearing

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Third Holroyd rotor milling machine for leading European air compressor manufacturer

One of Europe's premier manufacturers of air compressor technologies has ordered a new EX Series rotor milling machine from Precision Technologies Group company, Holroyd Precision.

The machine, a 2EX model, will be used to rough mill helical rotors of up to 250 mm in diameter. Scheduled for delivery in October 2020, it will join a Holroyd 3EX rotor miller and a Holroyd 4-EX-R-BL Roots-type blower air-end machine that are already in daily use at the air compressor specialist's manufacturing facility.

"There can be no greater testimony to the quality of our technologies than repeat orders," comments Holroyd regional sales director, Steven Benn. "While the customer concerned had looked at various other machine tool providers, they came back to us for our ability to provide the precise rotor milling capability they required, as well as for the proven reliability and high levels of performance and repeatability that are associated with our machines. With two Holroyd machines already on site, the opportunity to provide their operators with a machine tool they would clearly be familiar with was also cited as a key advantage."

The EX Series of rotor milling machines

The Holroyd EX Series 'standard build' range begins with the 2EX, a machine capable of milling parts of up to 250 mm (9") in diameter. The largest capacity standard build EX model is the 8EX which is able to cut rotor or worm helix profiles in blanks of up to 850 mm (33") in diameter. Where this diameter is too small, a custom-built 10EX model is also offered for milling blanks that are greater than 1,000 mm (39") in diameter.

Immensely flexible in their manufacturing capabilities, EX Series rotor milling machines are equally efficient at producing highly complex components with helical screw profiles as they are when being used to mill gear parts such as worm shafts. Engineered for complete integration with automated parts handling systems, all EX Series machines deliver class-leading performance, reliability and repeatability, and benefit from advanced technologies such as on-machine probing and dry milling techniques for certain materials.

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A cost-effective solution

Norton's new Quantum3 lightweight grinding wheels hit the mark for speed, accuracy and comfort

Norton has expanded its Quantum3 offering with the addition of a range of light comfort grinding (LCG) discs for multiple applications. Faster, smoother and more precise than the 7 mm counterparts, these 3 mm lightweight discs are rewriting the rules of grinding.

From tight spaces and T-sections to corners and curves, the new Norton Quantum3 LCG wheels grind it all, providing easier access and control, as well as better visibility when in use. The new grinding discs remove light welds, burrs and excess material quickly and effectively, whilst users can expect speed, accuracy and comfort through reduced vibration.

The Quantum3 LCG discs are a cost-effective solution for smaller jobs that need extra precision and are a great alternative to flap and fibre discs. Lightweight and easy to steer, projects are finished faster and machinery can be used for longer. Due to enhanced performance, less pressure is needed from users, meaning operator fatigue is minimised and product lifespan is increased. With the 3 mm discs, operators can remove material in an instant, whilst applying minimal pressure.

The self-sharpening shaped ceramic grains on each disc ensure an effortless glide through workpieces, removing metal quickly and accurately. In fact, the ceramic grains ensure fewer vibrations are felt through the machinery, creating safer and more precise grinding.

With improved grain performance of 80 percent, the Quantum3 LCG discs minimise machine maintenance, operator fatigue, metallurgical damage and improve part integrity. The discs can also be used with cordless angle grinders for hard-to-reach areas that mains powered machines cannot get to, making them ideal for those working in maintenance and repair on large sites, as well as those that provide mobile repair and installation services.

When used on a cordless angle grinder, Quantum3 LCG discs can remove up to 40 percent more material than traditional 7 mm aluminium oxide grinding discs during one battery charge. While a 7 mm disc is ideal for tough and heavy grinding processes, the 3 mm is ideal for smaller or more precise jobs. LCG discs also require less machine power on start-up and during use, helping to preserve the life of battery powered grinders by up to 50 percent.

For more information, visit **www.nortonabrasives.com** or watch at **https://bit.ly/3ecauXf**.

Saint-Gobain Abrasives is positioned at the leading edge of innovation and service, providing the most comprehensive abrasive solutions packages to its customers via a portfolio of highly recognised brands such as Norton, Norton Clipper, Norton Winter, Flexovit and Rasta.

Saint-Gobain Abrasives offers powerful, precise and user-friendly solutions which enable customers to shape and surface finish all types of materials, even in the most complex and challenging applications. By working closely with its customers and by leveraging its global presence, Saint-Gobain Abrasives designs and provides optimised comprehensive solutions and accessories to secure the best cost/performance for its customers. Saint-Gobain Abrasives serves all sectors of the market and has a strong presence in every continent, serving customers through structured sales operations in over 27 countries and employing over 10,000 people.

Abrasives form a key part of the High Performance Materials Division of Saint-Gobain, which is one of five key areas of activity in which Saint-Gobain operate.

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Lightweight core technologies for high-performance grinding tools

Workplace safety and process optimisation in manufacturing are becoming increasingly important. With innovative core technologies, TYROLIT not only makes work easier for production staff but also helps customers save time and money

Grinding wheels are high-performance tools and their properties are adapted to the respective grinding process through their design and specification. This is mainly due to the material used as the abrasive grain and the bonding system, both of which vary depending on the application. In addition to the abrasive layer, the core also plays an important role, especially in precision grinding of extremely hard materials. Composition, size and weight of the core have a decisive influence on the entire grinding process. The core is therefore not only the "link" between the abrasive layer and the machine but also an important system component with high optimisation potential.

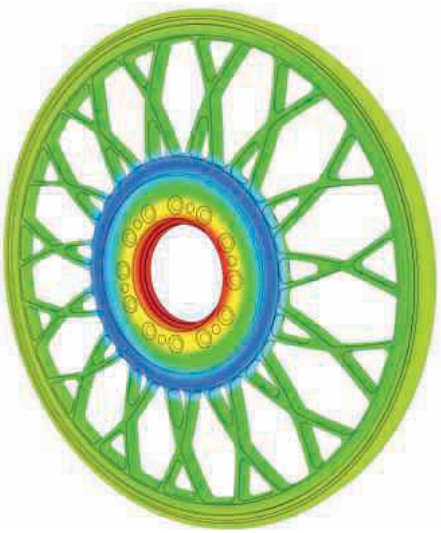
Above all, the vibration and damping behaviour of a grinding wheel is influenced by the shape and material of the core. The core also determines the weight of the grinding wheel. While steel is used particularly at high working speeds due to its strength, aluminium and aluminium alloys offer lower weight benefits. Carbon Fibre Reinforced Plastics (CFRP) combine the advantages of high operating speeds with lower weight. However, this leads to significantly higher tool costs.

The process-adapted design of cores enables previously unused potentials to be tapped in terms of grinding process behaviour, weight and vibration optimisation. A large part of the maintenance effort in precision grinding concerns the grinding spindle. Superabrasives in particular require high cutting speeds in order to fully develop their performance. Due to the high weight of the tools, the grinding spindles are sometimes exposed to very high loads during the production process. Every unnecessary gram means both higher service costs and increased energy consumption for accelerating and decelerating the grinding spindle.

As far as the physical strain on employees in production is concerned, much more attention is paid to health and safety. Limits in terms of daily lifting load and noise exposure at the workplace are regularly evaluated and adjusted. The required working speeds when processing certain materials can also lead to such vibrations and rattling that, on the one hand, there can be cross marks on the workpiece and, on the other hand, the noise exposure for employees becomes too high.

As a technology company, TYROLIT strives not only to be satisfied with well-functioning products, but also to view work processes in their entirety. Especially for external cylindrical grinding, tools with diameters of over 400 mm are often used. The electroplated CBN grinding wheels must be manufactured with a steel core, which inevitably results in a higher weight. Often additional staff or equipment, such as a hoisting crane, must be provided to carry out a tool change.

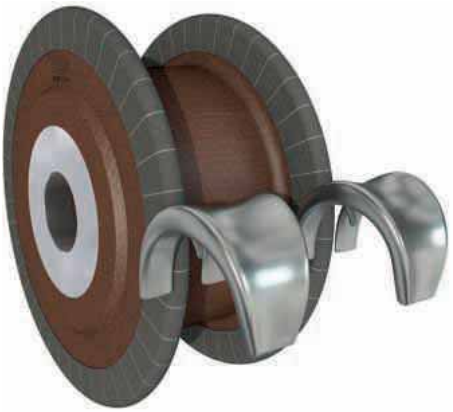
TYROLIT's many years of experience in the development of core technologies means that the challenges of precision grinding can now be met much more effectively in the future. By means of a numerical FEM simulation, grinding tools with the new and patented LW (Light-Weight) technology can be optimally



designed to meet customer requirements and at the same time a maximum weight reduction can be achieved without any loss of performance for steel carrier bodies. Through targeted material reduction in the core, the weight can be reduced by more than 50 percent in some cases.

With its patented LW technology, TYROLIT is currently the only manufacturer on the market that can offer a lightweight version for electroplated tools. The grinding tools of the POLARIS LW product line are much more spindle and bearing friendly than comparable competitive products. They are also much easier to transport and easier to install. The multiple reusability also offers customers the opportunity to save costs over the entire life cycle of the tool and puts the purchase price into perspective. TYROLIT also offers this technology in the field of vitrified bonded grinding tools with its GENIS 2 LW product line.

The universally applicable N-LW



(Natural-Light-Weight) core technology (the N in this case stands for a core made of natural fibre) is, on the other hand, ideally suited to wide grinding wheels, which are frequently used in centreless applications, and for smaller tools in the medical technology industry. Due to the extremely low density of the patented natural fibre core material, significant weight reductions can be achieved. The STARTEC CG product line combines the new lightweight core technology with a high-performance diamond grit, raising the standard in centreless through feed grinding to a new level of performance. N-LW cores also offer similarly good damping properties as the much more expensive CFRP cores, which has a positive effect on the grinding result in terms of waviness, roughness and surface defects.

In the field of high-speed external cylindrical longitudinal grinding, TYROLIT has succeeded in combining a core made of two different materials. As both materials have completely different damping characteristics, their combination leads to a previously unattained vibration behaviour, which enables a virtually vibration-free grinding process. This not only avoids the otherwise frequently occurring and unpleasant grinding noises, but also significantly improves the service life of the tools. A better grinding pattern without unsightly vibration marks increases the quality of the ground workpieces. The STARTEC PG-2 product line has been achieving excellent results with customers using this technology for several years.

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Three simple ways to optimise your honing operation

by Andrea Rodney, Hone-All Precision

Metalworking brings you better results if you take a systemised approach to your components. Honing requires you to work with bore size tolerances of 0.0001" so precision is a necessity. With the right machine, fixturing, abrasive, and oil, you can improve your quality and cycle times and reduce costs and lead time, therefore improving your competitiveness. Let's look at this in more detail:

Achieving perfect cylindricity

Cylindricity isn't always enhanced by quick honing speeds. You need to maintain low cutting pressure and velocity, removing only a little material at a time. Maintaining speeds that are slower than you would use in grinding can greatly improve the quality of the finished part. The torque achieved by your abrasive's pressure against the cutting surface is one of honing's most important forces.

The back and forth action of the hone is equally critical, but your choice of grit size and abrasive type depends on your application and material. Rough honing unhardened carbon steel demands aluminium oxide, for example, while finishing cast iron or copper requires silicon carbide. Your choice of stone length is equally important; insufficient length and you might lose cylindricity.

Fixturing

Finish machined components can sometimes distort once removed from the restraint of the fixture, but if you focus on the right torque and push-pull-action, you should find it easier to achieve geometric perfection. Your fixture technique can prevent distortion. A spring collet can be used to improve the uniformity of your pressure, but you can also configure your fixture to stabilise the relationship between your centreline and the parameters of the finish machined part.

Choosing the right lubricant

Your lubricant is responsible for removing honing stock and heat during the honing process. Your stone wear ratio will tell you whether your lubricant is performing well. An inadequate lubricant will achieve an inconsistent bond structure and erratic abrasive grain wear. If you're seeing metal specks in your work, your oil isn't lubricating as it should. Of course, every industry requires its own lubricant but, in general, you should match your oil viscosity to your production volume needs and whether or not you're using centrifuges.

Petroleum-based oils last longer than organics, but new, thicker oils have been developed to improve your shelf life and results.

The right tooling and expertise

Well-chosen tools can improve your accuracy by as much as 200 percent and even bring down your price. A worthwhile honing machine will allow you to customise your tools for each application. Horizontal machines are easier to load, but vertical ones are more suited to handling shorter components. Whether you're choosing a manual or automatic process, if you rely on expertise and informed calculations, you'll find it easier to choose your tools.

When outsourcing your honing operation, you need a partner with the machinery, tools and expertise to carry out your projects within the precise tolerances demanded by you and your customers. You also need one who will add their knowledge and integrity when quoting to ensure that you are advised as to the most economical form of supply to reduce your overall costs and lead times. We will always offer this advice to ensure you benefit from our machining experience and achieve the best possible quality conformance for the lowest possible price.

For advice on how you can optimise your honing operation, contact:

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There's more than one way to machine a bore. **Only Sunnen has them all.**

No matter what your bore machining application...from primary hole drilling to final finished bores...we have a turnkey solution for you.

Deep hole machining. Sunnen manufactures industry leading tools and accessories for deep hole drilling, trepanning, counter boring, form boring, skiving/roller burnishing...even Sandvik-style replacement cutters, cartridges and pads.

Honing. From manual, tool-room hones to automated, high-production systems, Sunnen will optimize your honing process with a conventional multi-stroke or single-pass system designed specifically for your application, including machine, tooling, abrasives, cutting fluids, bore gages and automated parts handling.

Skiving and Roller Burnishing. For cost effective bore sizing on hydraulic cylinders and other high-production applications, Sunnen's new SHD-series machines are 60% to 70% faster than traditional honing, yet deliver precise tolerances and quality surface finishes.

Lapping. When bore specifications call for extremely tight tolerances, Sunnen's SVL-series automated bore lapping machines bring increased productivity and consistency to what has traditionally been a manual process.

To find out about the latest technology in bore sizing and finishing, visit Sunnen.com or contact your local Sunnen representative.

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Partnership · Precision · Performance

GEHRING completes integration of e-motive unit

By start of June 2020, the Gehring Group planned to complete the integration of its production technology portfolio for hairpin stators within its e-motive business unit. The services and products will be offered worldwide under the Gehring brand in the future. With this step, the machine manufacturer completes the integration two years after the acquisition of the copperING group and offers its entire portfolio under the Gehring brand, from honing technology, laser technology, e-mobility to digital solutions. The locations in Wernigerode and Nuvolera, Italy will operate under Gehring Prozesstechnik GmbH and Gehring S.r.l in the future.

The technology specialist for electric drives copperING has been part of the Gehring Group since 2018. Since then, technologies and systems for the industrialization of e-mobility have been developed together with Gehring as an expert for conventional powertrain production systems.

The Italian location in Nuvolera has the experience and products related to electric motors and technologies for production of pins for hairpin stators. The German location in Wernigerode functions as a technology center for impregnation technology. Together with Gehring's expertise in system integration and supplemented by other self-developed technology, Gehring serves the global markets as a turnkey provider for stator production.

"Our customers want to receive the production technology for stators from a single source. This applies to the technology in the individual process steps as well as the overall system. This way, we can meet the high demands on productivity, quality and the pace of development. Our offer is characterised by this universal claim, which is now also reflected in a uniform brand," explains Dr Sebastian Schöning, CEO of the Gehring Group.

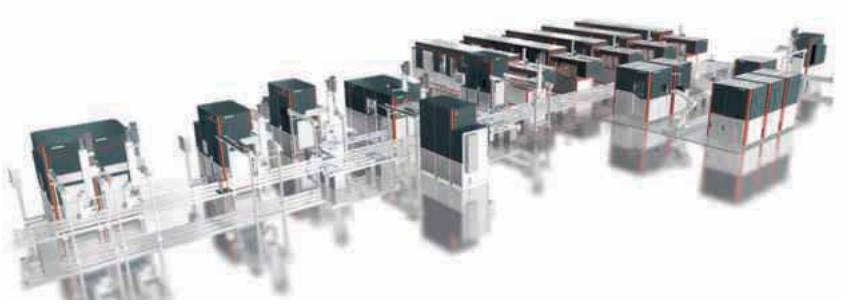
Gehring stator impregnation machine in Wernigerode

The Gehring e-motive business unit specialises in development of electric motors and sample production, as well as the design and supply of machines and production systems. This includes all aspects of prototyping, technology development and quality assurance. These capacities are combined to deliver tailored machines and production lines in turnkey projects. The technologies covered comprise pin production, slot insulation, pin assembly and widening, twisting, welding as well as impregnation, gel coating and powder coating.

The entry into e-mobile production technology and the integration of the copperING group is based on the Gehring Group's strategy for efficiency and technology openness in the automotive powertrain. In addition to emission reduction in combustion engines through the development of advanced honing, laser and coating technologies, the e-motive area enables the industrialisation of e-mobility.

Automobile manufacturers get their production technology from the Gehring Group's integrated, global production network.

The Gehring Group offers innovative production solutions for highly efficient conventional and electrified power trains. In the field of fine machining, the company has been shaping the development of honing technology for more than 90 years and provides the automotive industry with the processes of laser roughening, coating and honing answers to the current challenges around the combustion engine. The production technology for e-mobility expands the group's portfolio and sets new standards in the flexible series production of electric motors.



Turnkey system for volume production of stators. Gehring offers all technologies, machines and system integration from a single source

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Honing of fuel injectors

Sunnen is the technological leader for high precision honing of all types of diesel injector applications, resulting in lower manufacturing costs, higher efficiency, and fewer class sizes. The solution will create longer lasting fuel injectors that make engines run cleaner and more efficiently.

Sunnen advanced honing technology delivers improved bore geometry on high-pressure injectors for lower emissions and better fuel economy. It creates greater consistency of surface finishes, which means less wear, better lubricity, and longer injector life. It provides improved process control and greater accuracy for fewer class sizes and lower manufacturing costs, as well as greater system reliability and tool life, which means fewer tool changes and less operator intervention.

The company can provide a system for virtually any diesel injector application, including: a wide range of materials and surface finishes; bore diameters from 3-32 mm (.118 inch – 1.26 inch); landed bores, blind bores or simple bores, with and without cross holes and grooves; individual injectors or common rail system components.

Sunnen produces the industry's largest selection of honing machines, horizontal or vertical, single or multi-spindle, automated or manual, standard or customised. Its systems are designed with a focus on reliability, flexibility and ease-of-use.

SV-2000 Series vertical honing machines

The SV-2000 Series is capable of holding the industry's tightest production environment tolerances, as fine as 0,00025 mm (0.000010 in), with tolerances far superior to I.D. grinding.

Built on a proven, modular platform, the SV-2000 Series can be easily customized and automated to suit your exact specifications, whatever your needs demand, from multiple spindles to air gauging. Plus, this flexible system supports both single-pass and conventional reciprocating honing. Brushing stations can also be added.

Perfect for mid- to high-production manufacturers, the SV-2000 Series delivers the lowest cost per honed part with the tight bore tolerances you expect from Sunnen.

ML Series

These machines handle hard materials efficiently. Power stroking assures constant stroke length and stroke rates, as well as better control of bore size and finish with automatic size control and patented dual feed pressure system. There is no need for preliminary reaming, boring or grinding on many jobs. You can rough and finish in one operation. A lifetime application service is provided with every machine purchase.

Custom, high-production honing systems

Since 1924, Sunnen has defined the state-of-the-art in the industry and its current generation of high precision honing systems represents the very finest solutions available anywhere in the world. Sunnen systems are reliable, durable, and flexible and are designed to deliver the precision our customers have grown to expect.

From design to delivery, you have the Sunnen commitment to service and quality. Its technical experts will work with you to create a complete solution to fit your exact requirements, including the machine model, number of spindles, style of tooling, fixture design, abrasives selection, automation and gauging packages, and any other platform customisation you may require.

After your system is built, Sunnen will set up a live runoff demonstration at its facility. Once it meets all specifications, it will commission your system and train your staff.

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KADIA installs combined deburring and handling solution

Deburr-Automation-Cell increases output in production

Besides honing, mechanical deburring is the second business area of KADIA Produktion GmbH + Co. in Nürtingen. The company's portfolio includes a wide variety of deburring machines, most of which are designed for fully automatic operation, for example with the aid of a robot. At ZSO Zerspanungs- und Systemtechnik GmbH in Oberstaufen, the Nürtingen experts implemented three Deburr-Automation -Cells. The tasks of these systems include not only deburring the workpieces, but the robots also take over the complete handling for mechanical processing.

The machining technology market is highly competitive. For machining service providers such as ZSO, it is therefore clear that quality, process reliability and productivity must be raised to a maximum level, and this is only possible if processes are consistently automated. For this reason, ZSO has invested heavily in handling systems and the networking of its machinery in recent years. Of the 35 processing machines currently in use, a third are already fully automated.

General view of the RHDC from KADIA and machining centre at ZSO. The two plant sections form a complete production unit and work closely together thanks to the interface and well thought out process design

One of the most recent projects was particularly important for ZSO managing director Carsten Binder, PhD: the handling and deburring of grey cast iron housings for mobile hydraulic pumps weighing up to 26kg. These are, for example, pumps for the hydraulic systems in construction machinery. The housings go directly from the foundry to ZSO, where they are manufactured ready for assembly.

Depending on the variant, the robot guides the machined cast housings to three or four brush deburring stations. The station in the foreground is equipped with a widely projecting brush for deep contours that are difficult to reach manually

In previous automation projects of the Oberstaufen-based company, significantly smaller and much lighter workpieces had to be moved and deburred, so that lightweight collaborating robots were the obvious choice. The grey cast iron housings, however, are too large and heavy for this approach. Consequently, the employees moved and deburred the housings by hand. Not an easy task.

Manual deburring also has some disadvantages: each hand works differently, holds the tool at a different angle and presses the edges of the housing with individual force. This is particularly tedious when internal contours are difficult to access. There is also the risk of slipping with the hand tool and damaging the workpiece. A new solution had to be found to handle these tasks better: "Our plan was to have a robot carry out all the recurring processes," explains Carsten Binder. "Deburring would also be possible on the machine tool, but a

robot is the far more cost-effective solution for this."

Machine tool and robot - a perfect team

In KADIA, ZSO finally found a partner with the corresponding expertise in the fully automatic deburring of heavy workpieces. After a short time, the design engineers in Nürtingen presented a concept that convinced the ZSO managers. It is based on a 6-axis robot with a payload of 120 kg and a reach of 2.5 m. KADIA's customers receive such solutions completely from a single source. That means the scope of supply includes the process development, robot, cell, gripper, deburring stations and tools including special solutions, not forgetting, of course, the sequence programming with all safety-relevant designs. KADIA delivered a first automation cell in April 2019, a second in September and a third in January 2020.

The project involved connecting the automation cells to three identical Heller H5000 machining centres (MC). ZSO had gradually purchased several of these 4-axis machines especially for the pump housings, already equipped with robot interfaces. The robots were to carry out the loading and unloading of the machine tools as well as the deburring within the MC cycle time, i.e. within a time window of about 20 minutes.

Since two clamping settings are required, the workpiece is fed via a rotary table. The housings are clamped on fixtures specially developed by the machining specialists in Oberstaufen. All these steps also included a lot of programming and adjustment work for the project managers at KADIA. Coordination with ZSO was necessary regarding the housing variants and the jig and fixture technology, as well as with the machine and robot supplier with regard to the connection of the robots to the MC. An effort that is now paying off for the user, because machine tools and robot cells work together as perfect production units. This close cooperation between all those involved will continue in future, for example when new workpiece variants need to be programmed.

A view into the Deburr-Automation-Cell from KADIA. The cast iron housings are on pallets and are machined in the machining centre in a double pack

But what do the Deburr-Automation-Cells actually do? The most important work steps are as follows: The robot picks up two unmachined parts one after the other and places them in the fixture for the first clamping. During the machining process, the gripper places two more unmachined parts in the remaining free fixture positions, so that four workpieces are always in circulation at the same time. A second robot gripper is used for the second clamping. Before the workpieces are deposited, the swarf is blown off the contact surfaces with compressed air to ensure exact clamping. The machine processes the first and second clamping-setting in constant alternation.

Once the NC program for two setups has been run, the robot guides the workpieces for deburring. For this purpose, KADIA has equipped the cell with either three or four self-developed brush deburring stations with automatic wear compensation, depending on the housing variant. Round steel wire brushes are used for outer edges and outer surfaces, and specially manufactured square brushes with high-strength filaments are used for holes and inner contours. Thus, all contours can be reached and deburred in a reliable way.

Since the cleanliness of the workpieces is important for the customer, the robot arm places the deburred housings in a washing basket, which it then transports out of the cell. The handling of this container was to be integrated into the automation concept as a further sequence. Every fifth workpiece is also marked for inspection by quality assurance.

Complex processes, simple operation

Carsten Binder lists the advantages of the concept: first and foremost is the elimination of laborious handling for the employees. As a result, less personnel is now required than before automation. For manual operation, one employee was required per processing machine. A three-shift operation with three machines would therefore require a total of nine operators. However, thanks to automation, one operator now looks after all three production systems (MC and RHDC) in parallel.

It is important to note that no-one had to undergo special training to become a certified robot specialist, because KADIA and ZSO had agreed to make the operation of the systems as simple as possible. "We have included the option 'Retraction strategy: home position' in the concept," explains Udo Frieß, robotics and deburring expert at KADIA. "This allows the operator to return the machine to the initial position at any time in the event of an interruption and to restart it from there. He does not need a robot panel for this.

From left to right: Udo Frieß, robotics and deburring expert KADIA, Dr Carsten Binder, managing director ZSO, Michael Stark, project manager at ZSO

"Automation has eliminated many scheduled and unscheduled interruptions, so our output has become more continuous and we produce more parts per unit of time," confirms Carsten Binder. Dominik Landhäußer, Sales Engineer at KADIA, adds: "We usually see that the machine tool output can be increased by 30 to 50 per cent with the help of Deburr-Automation-Cells, always depending on the workpiece and the processes to be integrated."

As a specialist for honing and deburring, KADIA Produktion GmbH + Co has been developing machines for a wide variety of mechanical deburring processes for many years: with brushes, abrasives or tools with geometrically defined cutting edges. As of late, these include mainly robot solutions or Deburr-Robot-Cells.

The most recent stage of development is the Deburr-Automation-Cell, which, in addition to deburring, also performs handling tasks for other connected machines.

(Photos courtesy of KADIA)

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From pizza pans to award winning subcontract partner

Alphin Pans has it covered

For a business that began life in a garage importing and selling pizza pans Alphin Pans has come a long way since its creation in 1989. For the first 20 years of its existence, it was happy to simply buy and sell pizza pans and associated equipment, building solid foundations and counting the leading UK pizza supplier as a key customer. When stock and logistics issues arose with its suppliers in the Far East and encouraged by speaking to contacts in the metal spinning business, the company took the decision to invest in manufacturing in the UK and in 2009 took delivery of its first metal spinning lathe.

"We had been happy to operate as an importer/wholesaler of products for 20 years but, when faced with supply problems, we investigated manufacturing in the UK and found, to our surprise, that this could be done competitively," says Alphin Pans managing director, Matthew Sykes. "Having made an initial investment in 2009, we took the decision to relocate and invest further in 2011, which brought pressing and flat-bed laser capability in-house. Initially this capability was for our own pizza pan production, but over time we recognised the potential to offer this to others as a subcontract service."

Success quickly followed and the business is now split 70/30 in favour of subcontract metal spinning, pressing, profiling and forming, with customers from across a range of industries including industrial lighting, Tier Two nuclear, construction and more general subcontract work. This success has seen Alphin Pans also build an international customer base with its products exported far and wide, from Iceland down to the Middle East, which has just resulted in it being awarded the 2020 Queens Award for Enterprise and International Trade. As a result, further investment was made, including the arrival of a deburring and surface finishing capability in the form of two Timesavers machines from Ellesco.

"We pride ourselves on being able to respond quickly to customer requests and this has been possible thanks to our willingness to invest. Our two Timesavers deburring machines are a case in point," explains Matthew Sykes.

The Timesavers machines are a 42-1350Rb and a 22-900-W, the former

The Timesavers 42 and 22 Series machines are run in tandem at Alphin Pans to deliver significant productivity gains

being initially purchased to meet the requirements of one particular customer, for whom Alphin Pans managed production spikes on some 0.9 mm thick laser cut stainless steel parts. While the laser produced a perfect edge, for health and safety reasons that edge required some finishing. Exchanging ideas with the customer, that already used Timesavers, the decision was taken to purchase the 42-1350Rb machine with its rotating brushes that provided the exact edge preparation that was required.

"The Timesavers 42 series machine is a fantastic piece of kit that we use purely for edge finishing and we have run hundreds of thousands of parts through it without any problems," says Matthew Sykes.

The second Timesavers machine was introduced to eliminate the need for hand graining of 5 mm thick aluminium parts, with the machine being purchased after seeing just six sample parts being processed. The results after those six parts and the confidence that Alphin Pans had from the first Timesavers machine made the investment in the second machine an easy decision to make.

"The impact the 22 Series machine has had is significant as we have saved hundreds of hours since its introduction. With hand graining these parts would take at least five minutes, where with the Timesavers 22 series and its 900 mm wide abrasive belt these same parts are processed in seconds to a consistent standard.

"The ease-of-use of the machines is also a positive as they can be operated by anyone in the company with minimal training allowing skilled staff to be deployed on higher value work," says Matthew Sykes. "From both machines the added value that we now present to the customer is a positive and they were also impressed by our pro-active approach to meeting their requirements. The result is that we have gained more work, with indications that volume work is also being on-shored back to us thanks to willingness to invest and react positively to challenges."

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Rounded edges, reliable processes, less wear

Mass finishing is a winner for Wunschmann Precision Tools

Germany-based manufacturer Wunschmann is boosting the performance of its precision cutters with OTEC's new drag finishing machine.

"Actually, it goes completely against common sense," jokes Stephan Wunschmann, "First we grind the cutting edges of our milling tools until they're as defined as possible and then we round them off again in the drag finishing machine."

It may sound like nonsense, but there's method in the madness: in drag finishing (or mass finishing), parts, in Wunschmann's case milling tools for metal cutting, are pulled through a bulk container. The material abrasion is clearly specified beforehand: deburring/rounding or smoothing/polishing. This optimises the tool's surface and improves its functional properties. The process on the OTEC DF-3 drag finishing machine takes between 30 and 60 minutes. Wunschmann GmbH has now been using the machine for several months at its Hailfingen site and is impressed with the results:

"A lot of our customers are sceptical about mass finishing at first, but it's definitely won me over. Obviously it's not suitable for every tool. You have to use it for specific purposes and always with accurately defined edge-rounding values. So you need to be prepared to tinker a bit to obtain the optimum rounding value for each cutter," says Stephan Wunschmann, a toolmaking specialist and veteran, who invested almost €80,000 in the drag finishing machine.

For example, preparing the edges in this way has extended the service life of the Wunschmann HPC-Vplus 187 high-performance cutter by around 30 percent when milling chromium-nickel steel (1.4301).

"The tool still bites despite rounding, and on top of that we've seen an improvement in wear resistance and process reliability," says Stephan Wunschmann. "Before treating them, the cutting edges on our 187 were more ragged, which tended to cause erratic wear. Rounded edges wear more slowly and evenly."

Moreover, Wunschmann's toolmaking experts have found that the benefits of mass finishing go beyond edge rounding; it also helps to polish chip flutes on milling tools, which in turn improves cutting performance and chip removal.

All in all, Stephan Wunschmann considers the machine a good investment and believes that drag finishing will provide his customers with even higher-performance cutting tools and not just new ones; edge rounding or chip flute polishing can also boost the performance of resharpened tools.

Polished chip flutes for optimum chip removal and high process reliability. HPC trochoidal cutter 175 ER

Wunschmann precision cutting tools have enjoyed a good reputation in metalworking for 40 years. Its customers rely on the quality and performance of the standard and custom tools made of solid carbide (SC) and high-speed steel (HSS). Long-standing users of the products value Wunschmann's technical expertise, experience and personal service.

OTEC drag finishing machines

In drag finishing, the workpieces to be processed are secured in special holders. These are dragged through a container of grinding or polishing granulate in a circular motion at high speed. The quick motion generates a high pressure between the workpiece and the abrasive. This quickly leads to an optimum processing result in the form of precisely rounded edges, smoothing or a high-gloss finish in hand-polished quality.

(Images by KRAAS & LACHMANN Werbeagentur GmbH, Tübingen)

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Drag finishing machine at OTEC customer Wunschmann

Superfinishing with Kemet's new PR3 composite

The majority of superfinishing operations, i.e. those where materials need to be polished to an Ra value below 0.01µm, raise a number of issues that until now have meant compromise rather than ideal solutions.

Typically, if you are starting with a machined component the challenge is how to produce a superfinish in the most economical way. To date, the most common solution would involve a lapping operation to first produce a flat surface with a uniform surface finish, followed by a polishing operation which in many cases involves a polishing pad to generate the superfinish.

This is an acceptable solution for many parts, but one side effect from any pad polishing process is the removal of any sharp edges. This is called roll-off and can be seen on the edges of many polished parts where the part has sunk into the polishing pad material and the edges have been softened by the nap of the pad. This effect becomes more obvious the longer a part is processed on the polishing pad, so it's important to balance the speed of the lapping stage against the resulting surface finish in order to minimise the time on the polishing pad.

It is becoming more common for a component designer to ask for the sharp edges to be maintained. This is particularly evident on sealing components where roll off would cause parts to leak.

The new Kemet PR3 composite plate material, for use in combination with Kemet's closely graded Liquid Diamond slurries and Diamond Compounds, has been developed to provide a solution to this issue. It can produce a surface finish value better than what you would expect from a purely polishing process, but it also has the ability to remove material at the same time. It has no metal content within the composite, so is therefore ideal for applications where components must not be in contact with metals, in particular those in nuclear and electronics.

The lack of metal in the plate and the use of ceramic faced conditioning rings means parts are much cleaner after lapping, in particular white aluminium oxide based ceramic materials. Since the surface finish

after the PR3 is so good on many materials there would be no need to follow it with a pad polishing stage, but in circumstances, where secondary pad polishing is needed, the polishing time is short enough for no roll off to be produced.

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The bore finishing specialist

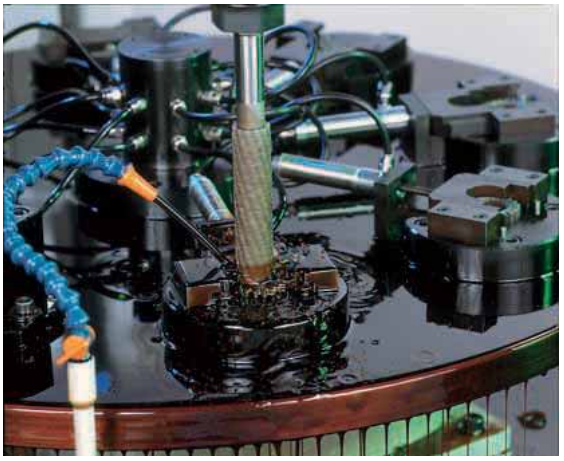
Based in Henley-on-Thames, superabrasives specialist Engis UK is the European Headquarters of Engis Corporation and supplies customers with solutions ranging from one-off electroplated grinding and honing tools, to complete bore finishing machines.

One of the benefits Engis UK offers customers is its well-equipped bore finishing laboratory which provides technical support and expertise in developing bore geometries for applications in sectors including automotive, hydraulics and aerospace, using materials including ceramics, steels, iron and aluminium.

Expanding these facilities, the Henley laboratory has recently seen the installation of one of Engis latest SPM 6000 bore finishing machines, with which it will conduct process and tooling trials for customers and prospects across Europe. The new machine is supported by leading-edge metrology equipment, with the ability to measure the cylindricity, roundness and straightness of bores to an accuracy of 0.1 micron.

Investment in the laboratory demonstrates Engis UK's belief in working closely with customers to develop optimum solutions to their manufacturing requirements, and each process, including stock removal rates, bore geometry requirements and surface finish, is studied, step-by-step, to ensure customers achieve all their engineering objectives.

One of the most critical features in any bore finishing system is the work-holding fixture design. Using the new machine, Engis technical staff are able to review each application and determine and test the best approach to fixture the part, so that the bore geometry objectives can be achieved. In addition, other key factors such as simplicity, versatility and quick change-over can also be taken into consideration, so that the entire process can be trialled.



Benefits of single-pass bore finishing

Conventional bore finishing uses a tool with cutting surfaces that expand and contract as the tool reciprocates in the bore through the cycle. Unfortunately, simultaneous radial and axial movement makes controlling bore size and cylindricity difficult. Engis single-pass bore finishing process, which uses fixed-size bore finishing tools electroplated with diamond abrasive particles, overcomes these issues, as the tools pass through the bore only once, removing a specific amount of material. Using a series of progressively larger bore finishing tools Engis single-pass system enables precise and repeatable control.

The SPM 6000 which has been installed in Henley is one of Engis's range of small production machines and is designed to meet the needs of manufacturers of small to medium sized components with bores up to 50 mm diameter. The machine can be configured in four, six, eight and 10 spindle models. The example installed at Engis UK is a six spindle, eight station version.

Standard features of the machine include a servo-fed column, life-time pre-lubrication of linear slides and ball screw, pneumatic counterbalance on the head and an electro-mechanical, cam-style precision indexer, together will full Mitsubishi CNC controls capable of supporting additional optional advanced features.

Possible additional enhancements include: extended stroke length (standard 457 mm), spring-loaded "crash sensors" interlocked with machine controls to protect the machine and tooling from potential accidents, shadow gauges (interlocked with the machine controller) to detect mis-loaded components, full-perimeter guarding with light curtain for added operator safety, a "walk away" switch that enables increased production potential, as well as a wide variety of automation and gauging packages and torque-based feed compensation, and electric controls packages.

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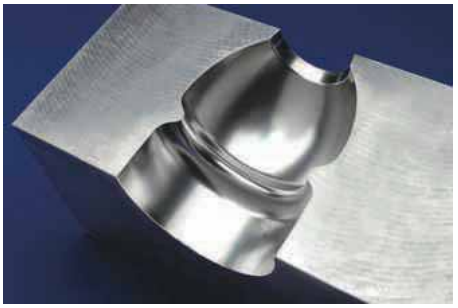
The final touches for surfaces



LaP 2020 Conference on Laser Polishing
For the fourth time, laser polishing will be the centre of attention at the Fraunhofer Institute for Laser Technology ILT in Aachen on September 16 and 17, 2020. As a premiere, however, the "4th Conference on Laser Polishing – LaP 2020" will take place virtually for the first time. On both days, due to the large number of international participants, the conference will start at 1.30 p.m. and end at 4.30 p.m. (both CET). For the first time, experts from all over the world will discuss new ways to use and develop laser polishing online.

In 2014, Fraunhofer ILT hosted the first "Conference on Laser Polishing – LaP" to exchange research results in an international setting. Since then, the English-language event has become a meeting place for laser polishing experts from all over the world.

"In the past we had many participants from Asia and America," states Dr Edgar Willenborg, who heads a research team at Fraunhofer ILT with seven scientists who are intensively involved in laser-based deburring and polishing. That is why the virtual conference starts at 1.30 p.m. on both days, which is in the evening for Asia and in the morning for America. We found that 1.30 p.m to 4.30 p.m was the only reasonable time frame for an international online conference."

Problem case of "subsurface damage" solved
A glance at the program reveals its scientific character: Of the ten lectures in total, all are scientific, with nine of them focusing on the laser polishing of metals. "There will also be a lecture on laser polishing of glass optics," explains Dr Edgar Willenborg. "This is a real highlight. On September 16, starting at 2.50 pm, there will be a detailed examination of how lasers can be used to eliminate subsurface damage of optical glasses." These small micro cracks are created when grinding glass and can be reliably removed by laser polishing.

The final touches for 3D components and tools
The second conference afternoon starts with two highlights in the laser polishing of metallic components. Chinese scientists will demonstrate at 1.40 pm how near-surface porosity of metal components manufactured additively can be removed. The second lecture at 2.15 p.m. will deal with how tool steel can be optimally laser polished with the help of a permanent magnetic field.

For further information how you can take part, contact:

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Unlock a new level of flexibility for finishing applications

A popular introduction from RARUK Automation last year was the Robotiq Finishing Kit, an easy-to-integrate solution that allows any Universal Robot to be economically used for finishing wood, plastics, metals, fibreglass, carbon fibre and solid surfaces.

The latest generation of this kit now comes complete with Finishing Copilot software, whose weaving motion and variable trajectory planning enables a cobot to adjust its own path. This means the Universal Robot can finish a family of parts without the operator having to adapt the programme.

Copilot's path generator saves hours of programming time. It allows the user to teach a finishing path on a flat surface from only four variable waypoints that adjust to the part's size and for custom weaving movements to be easily added.

Complex finishing trajectories can be programmed by teaching fewer than ten waypoints. Finishing Copilot then generates a complete path and applies a consistent force at each cycle, whether it is on a curved

or spherical surface, with six or nine waypoints respectively.

The contact offset node uses reference points on the part to validate its position. If there is any change, the Universal Robot programme automatically adapts all related parameters.

This latest development will particularly benefit manufacturers of cabinet doors and those whose production methods include finishing, sanding and polishing. The kit allows operators to use their preferred orbital tool as it is compatible with around 20 tools from leading brands.

Complementing this application-specific development is the latest Universal Robots PolyScope software release that includes new features such as Direct Software Update and Constrained Freedrive which enhances flexibility, making alignment and positioning easier. It also includes improved support for fixed position of waypoint programme nodes for applications such as sanding and added payload support for gripper driver contributions.

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Great technology for perfect coolant filtration throughput

Integrate many tool grinding machines with one filtration system

Optimally filtered cooling lubricants are the prerequisite for higher productivity when grinding carbide and HSS tools. Especially when a great number of grinding machines on a single filtration circuit, a powerful central filtration system for cleaning contaminated grinding oils or aqueous coolants becomes indispensable. VOMAT a company specialising in metalworking fluid filtration, from Treuen, Germany, provides stand-alone filtration systems with its FA series as well as central filtration systems with the ZFA series-machines, that can be configured to suit any given production situation. VOMAT systems increase the life of the cooling lubricant thanks to the use of high-performance pre-coat filters and automatic on-demand flushing and back-flushing technology.

Economic, process-reliable tool grinding with high quality results is only possible with extremely clean grinding oils. VOMAT is a specialist for ultra-fine filtration of cooling lubricants in the metalworking industry. The product portfolio includes solutions for stand-alone and central systems as well as individual customer-specific special configurations with central and decentralised functions.

The recyclables are disposed of fully automatically directly into the transport containers provided by the recycling companies

Steffen Strobel, technical sales manager at VOMAT states: "The larger the production batches are and the more grinding machines are integrated into the filtration process the more likely our ZFA central filtration systems are the right solution. They can be precisely adapted to the respective production conditions and needed coolant flow rates. Further capacity extensions are also possible, in case of later production expansion.

The central filtration systems from VOMAT consist of separate modules that can be scaled up in steps of 1,200 litres

"Our ZFA systems grow with changing requirements, thanks to their modular design. Modular units such as frequency-controlled machine pumps, tanks and cooling components allow for this flexibility. It also results in maximum filtration performance in different phases of a company's development."

VOMAT filtration systems have an on-demand backwash system which automatically starts once it senses, that the filters have reduced throughput. In addition, VOMAT systems, always separate dirty and clean oil one hundred percent. Due to the back-flushable high-performance pre-coat

filters, cost-intensive filter aids are unnecessary. The central control unit links all system modules and controls external components such as machine supply pumps (MSP) etc. In addition, remote diagnostics is available via an internet connection.

Steffen Strobel adds: "The data exchange between the machine tool and the filtration system takes place via control signals. When two or more machines are connected to one filtration system, a machine interface box is required. The control signals can be provided by either the filtration system or by the machine tool."

The ZFA 1200 is the base model of VOMAT's central filtration systems and is capable to filter to a fineness of NAS 7 quality class (3-5 µm). The cooling capacity of the PLC-controlled cooling unit is designed to fit any given production process. The AC generated heat is dissipated via an external condenser. VOMAT also offers cold water- cooling as an option.

The ZFA 1200 filtration unit is very compact with dimensions of 1,200 x 1,200 x 2,200 mm (L x W x H). The base unit can be expanded in steps of 1,200 litres, thanks to the large selection of modules and additional optional components. The sludge disposal volume is reduced to a minimum due to minimal drag-out loss. The recyclable material is disposed of fully automatically directly into the transport containers provided by the recycling companies. The residual moisture of the recyclable carbide and HSS swarf is approximately 5-10 percent.

Steffen Strobel continues: "Our low-maintenance and user-friendly technology ensures energy-efficient full-flow filtration, even in large installations, with high flow rates per minute. Thanks to modern cooling technology, there is no critical heat input into the cooling medium. The combination of backwashing and the resulting high filtration purity allows for long coolant and filter life combined with great energy savings."

The central filtration systems from VOMAT consist of separate modules that can be scaled up in steps of 1,200 litres. The recyclables are disposed of fully automatically directly into the transport containers provided by the recycling companies.

With flexible modular units such as frequency-controlled machine pumps, tanks and cooling components, the ZFA–system can adapt to changing system requirements.

Thanks to flexible modular units such as frequency-controlled machine pumps, tanks and cooling components, the ZFA-system can adapt to changing system requirements

Data exchange between the machine tool and filtration system takes place via control signals. Thanks to an installed internet interface, the ZFA Has remote diagnostics.

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New packaged high-quality water system is "Good to Go"

Axium Process's new "Good to Go" packaged water treatment system is designed for water purifying applications and delivers commercially sterile, sustainable, high-quality water, bypassing the need for ion exchange beds and chemical treatment processes.

The system, which utilises reverse osmosis technology, is being used for applications where low conductivity (salt removed) water is required and can be used in conjunction with complementary processes such as carbon filtration and ultraviolet (UV) treatment, providing a robust and versatile solution to tackle almost every water purification application.

Delivered as a packaged solution, requiring only minimal operator intervention and very low maintenance, Axium's "Good to Go" system is supplied with high rejection low energy membranes, stainless steel housings and pipework throughout, cartridge filter, multiple sample points, conductivity monitor, feed pressure switches, variable area flow meters and an inverter-controlled pump as standard.

The company, which specialises in the design and build of membrane filtration systems, can provide "off the shelf" or "custom solutions" to suit specific requirements.

Axium Process is a 'one stop' engineering house providing customised solutions to meet your individual requirements, be it for a membrane filtration system to treat effluent or for a stainless-steel pipe work fabrication to fit an existing installation. It also maintains a comprehensive stock of stainless-steel tube and pipe fittings that are available with full material traceability and a next day delivery.

Operating from a 30,000 square foot facility, Axium Process has fully streamlined and integrated all its processes creating a truly "one stop shop" that encompasses professional CAD drawing office facilities, a CNC equipped machine shop, MIG,TIG, Automatic Orbital welding and Metal Fabrication departments, a high specification Metal Polishing and Surface Finishing department, as well as bead blasting and an electropolishing operation.

Axium Process is an ISO 9001 registered company and operates rigorous procedures to ensure that all aspects of material selection, design, production, packaging and delivery conform to customer specification.

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More capacity, higher productivity

Why a precision engineering firm couldn't live in a world without ZOLLER

When you're working around the clock to meet customer demand in safety-critical industries, you can barely afford to waste a single minute of the day.

Benham Precision Engineering has been a leading supplier of complex components and sub-assemblies to the aerospace and defence sectors for many years, operating 22 machine tools to create a range of parts such as manifolds, bodies, castings and casings, each to exacting standards.

Based across two sites in Southampton, the company's ethos has always been one of constant improvement in terms of its technology, people and processes, particularly when it comes to driving efficiency. That dedication to being the best of the best has helped to steer the business's continued success, and played a major role in the decision to invest in a ZOLLER tool presetting solution that continues to work seamlessly and help maximise Benham's productivity, more than a decade after the Smile 600 machine was first installed.

Benham's engineering manager Neil Griggs says: "We've got some 76-tool change machines in our factory. It was taking us up to three hours to find the tools, put them in the machine and measure them. That's dead time.

"We've had the ZOLLER for about 12 years. We wanted to reduce cycle times on the shop floor. Our tool setter builds the tools from our setup sheet and then puts them onto the ZOLLER and measures the lengths, diameters and so on.

"All the information is stored on the back of the chip and that is then put to the machine. Consequently, what that does is it saves time on initial setup and probably reduces our setup on long-running jobs with multiple tools by two hours."

ZOLLER, the only company in the UK dedicated exclusively to supplying tool presetting and inspection equipment, specialises in delivering process efficiency without compromising quality, helping companies to unlock the door to sustainable and long-term profitability.

Traditional tool setting, even with

advanced laser technology on a CNC machine, is unreliable as it cannot validate critical tool features such as diameters, corner radii, step lengths and run-out prior to machining, increasing the risk of costly crashes and failures.

Legacy methods are also highly inefficient. While a CNC machine is setting tools, the spindle is idle and is not doing the job that it was intended to do, making parts.

Such inefficiency is immediately eradicated by a ZOLLER offline tool setting solution, which brings with it a wealth of other benefits, from increased machining capacity to quality right-first-time products and extended tool life.

Neil Griggs adds: "It's about speed and efficiency. It means we've got more capacity on the machines and more productivity.

"The ZOLLER basically takes out about three hours at the front where someone else has found and built the tools and measured them. So, rather than finding the tools, building them, putting them into the machine and then measuring them, all of that's done."

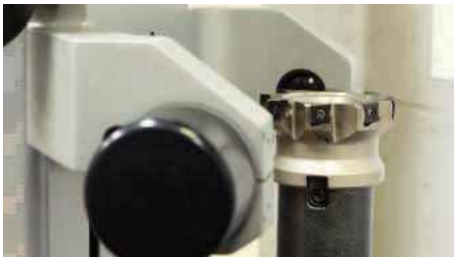
ZOLLER's best-in-class Smile range guarantees high-level accuracy and repeatability in presetting and measuring cutting tools prior to machining work, thanks to unique power-clamping spindle and auto-focus capabilities.

Manufactured exclusively from industry-leading components and boasting telecentric optics for enhanced performance alongside seamless data transfer options, the system's robust and ergonomic design makes it suitable for use in the heart of the production environment, right beside CNC machines.

Neil Griggs continues: "We're tied in with Mazak and basically that's how we got onto buying the ZOLLER, because it's in Mazak's showroom. We've had no reliability problems and get a service every year. In fact, there have been no issues with it at all."

Today, Benham Precision Engineering simply cannot imagine life without ZOLLER, and Neil Griggs has a very clear message for any business yet to take the plunge into offline tool setting due to perceived barriers such as cost, process upheaval, employee training requirements and uncertainty around return on investment:

"Do it," he says. "You will gain the profit back within six months. Benham would never be without a ZOLLER because it keeps the spindle running. It's more profitable for us."



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CNC upgrade programme provides a major productivity advantage

32-year-old insert grinders given new lease of life reducing production times by 10 minutes per part

US cutting tool manufacturer McQuade Industries, Inc has gained a highly cost-effective productivity advantage by implementing a CNC upgrade programme for a line of 5-axis insert grinders. The upgraded machines are much easier to set up and operate, which has enabled the company to shave more than ten minutes per part off the production time of complex geometry cutting tools.

Founded in 1978, McQuade Industries has built an enviable reputation in the metal cutting industry for very high quality precision indexable cutting tools. Based in Clinton Township, Michigan, the company produces a diverse range of cutting tools, including boring bars, milling cutters, generating heads, draw bar style tooling and cartridges, as well as complete turnkey tooling packages. It also provides customers with fast turnaround tool regrinding and repair services, backed by extensive expertise in special carbide and precision form inserts.

The machines that are being upgraded are RS12 insert grinders, originally manufactured by Ewag AG in Switzerland. McQuade installed a number of these highly regarded precision grinders back in 1988, and over the years they have provided stalwart performance. However, as McQuade's production manager Donald Ostgen explains: "After 30-plus years, even the best machines can begin to show signs of their age! Although still in good mechanical order, the grinders' control systems were beginning to lack the flexibility we needed for some of today's more complex tool geometries, leading to lengthy setup and machining times."

Apart from the fact that the insert grinders still represent a valuable asset, McQuade had developed a large number of part programs over the years, which ideally would need to run on any replacement machines without requiring modification. The company therefore decided to preserve its investment by implementing a programme to upgrade the machines' CNC systems and subsequently engaged the services of Advanced Machine Technologies, LLC, a specialist CNC retrofit company based in Owosso, Michigan.

RS12 insert grinder prior to upgrade

The original RS12 insert grinders were fitted with NUM 760 CNC systems, NUM Guttinger NGS 610 servo drives and NUM/SEM brushed servomotors. Having partnered with NUM on numerous automation upgrade projects over the past 22 years, Advanced Machine Technologies has considerable experience in replacing legacy systems such as these. In this instance, the company recommended upgrading to NUM's latest-generation Flexium+ 68 CNC system, and replacing the drives and motors on all five axes with NUMdrive X digital servo drives and new NUM brushless servomotors.

By transitioning to NUM's Flexium+ CNC platform, McQuade would secure full grind cycle flexibility while continuing to use a familiar HMI (human-machine interface) and machine setup operations. This upgrade path also provides full backwards compatibility with part programs that the company had made over the last thirty years. Furthermore, the embedded PC in Flexium+ represents a flexible IIoT platform that is Industry 4.0 ready, offering McQuade powerful connectivity advantages for future productivity enhancements and enabling NUM or AMT to provide remote support services if required.

The all-new Flexium+ CNC system

RS12 insert grinder after upgrade

McQuade sanctioned the work, requesting that Advanced Machine Technologies initially upgraded a single machine so that its performance could be evaluated before progressing further. As part of the upgrade, in addition to the CNC system, drives and motors, the insert grinder was fitted with a new NUM FS-12 touch-sensitive operator's panel, an MP08 machine panel, and an HBA series portable hand-wheel. The variable frequency drive for the existing grinding spindle motor was also replaced, using a smaller footprint NUM DriveX servo drive to fulfil the role.

The upgrade has proved a resounding success. The move to all-digital drives and motors has significantly increased the overall speed and performance of the machine, resulting in faster grind feed rates and improved surface finishing.

The first upgraded RS12 insert grinder is now in full operation on McQuade's production line, and the company has already commenced upgrading the next machine on the line.

Donald Ostgen concludes: We are able to run parts on this machine that we could previously only run on our wire EDM machines and its increased flexibility means we are now saving over 10 minutes per part compared to the pre-retrofit model."

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Breakthroughs in industrial automation for smaller tool manufacturers

Industrial automation is changing the way cutting tool manufacturers operate. Machines have taken on the heavy lifting at each stage of production letting workers get on with less repetitive tasks and, while automation may sound costly and complex to implement, it's not reserved just for just big business. There are dozens of ways a small cutting tool manufacturer can embrace automation for a more efficient and more innovative factory.

What are the benefits of industrial automation?

Cost reduction, through labour costs or machine uptime. The drive for automation is being driven by availability of skilled labour, where and machines can fill those gaps.

Automation is an important step to help people meet regulatory obligations with relation to the limits of weekly work hours without compromising machine utilisation.

Reduced material handling makes run smaller batches much more cost effective.

Streamlining of existing processes and systems across the business.

Eliminating mistakes in material management.

Automating in-process measurement raises the quality of tool production and can nearly eliminate waste, meaning more profit.

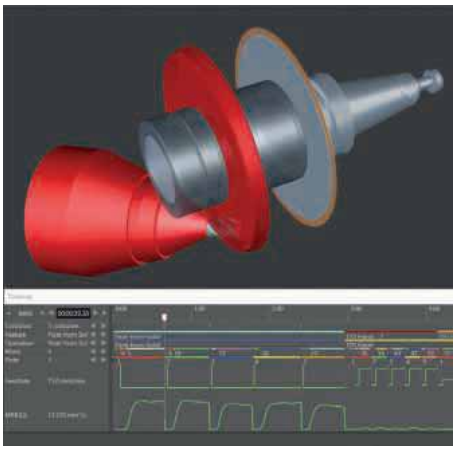
Don't invent, stand on the shoulders of giants

It's true that bigger companies have more buying power. When it comes to industrial automation, they have plenty of scope to ask for tailored developments to suit very specific needs or to make these adjustments in house. However, as new technology and solutions are developed in response to these requests, the industry as a whole will benefit.

Just because a technology is off the shelf, it doesn't mean it is 'standard'. In fact, industry is constantly evolving as new solutions are found and applied. While their technology development may have been developed at the request of a large customer, as soon as it's scalable it can be rolled out to suit most businesses. At ANCA this includes many new innovations, including 3D simulation software, its own in-process measurement system Laser Plus, and RoboTeach, which makes robotic loaders accessible and easy to program.

The addition of laser etching on a robot loader is another example that has increased the functionality of the grinding machine by including what would otherwise have been additional downstream steps in the process of making tools.

As a small tool manufacturer, vendors recognise that your priority is maximising your factory's efficiency, i.e. machine uptime versus setup time. They know that you need software and accessories that will help you keep things ticking over without wasting time and money reloading materials.



How do you approach where to start?

Chances are there will be no obvious trigger when it comes to adopting industrial automation. Many smaller businesses won't have planned to develop the level of automation they have. Some may have started only after an increase in labour and setup costs forced them to look for ways to run more smartly, but that's ok. You can build your automation solution piece by piece, as long as you have an agreed vision.

It may be as simple as being observant and seeing which steps in your production process have the greatest cost. Unlike other efficiency drives there is no harm in approaching this piecemeal. Start by attacking the area of your business that will provide you with greatest value. For instance:

Look for industrial automation solutions that reflect how you operate

At the smaller end of the tool cutting market, there's a good chance you're producing small batch lots and changing geometry multiple times a day, rather than leaving the machine running constantly making the same tool all day.

In this world, innovation is often a

secondary need to maximising day-to-day productivity. For instance, look for solutions that allow the operator to step away from the machine and carry out other tasks, rather than being there all day. Automating geometry changes and your existing manual material management processes can make a real change to how much they are able to do elsewhere and help you maximise machine uptime vs setup time. Time is, after all, money. Automate production but also consider automating processes.

You may not have the business budgets to request tailored solutions, but out-of-the-box solutions are available that can be used to manage inventory, integrate with your ERP to manage job order, and even pack ready for dispatch. Many will work effectively with your existing processes, even if you have never automated them before.

Industrial automation can keep your focus on people

A small cutting tool factory relies on every working part being up to scratch and that includes your people. Automation removes the risk of human error creating a safer working environment that's less likely to be disrupted. Furthermore, changing government legislation is limiting how many hours' employees can work. Automation is the obvious solution to maximise machine time when people are not present.

Applying industrial automation solutions that connect you more to your customers will allow you to see in real time what they're low on, what's in high demand, or what's coming up in your production that will suit their requirements. This allows you to explore other areas of production and manufacture tools knowing with confidence what your customers want.

Everyone can afford and benefit from existing industrial automation solutions

Automation can take the pain out of being a small tool shop. Your new factory of the future will be able to produce multiple kinds of tools without getting bogged down in manual operations.

We can all benefit from streamlining systems and processes. Focus on your speciality and leverage the tech that's already out there. There are better ways for you to use your time. Grind the wheel, don't reinvent it.

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Controlling parts washing methods for medical components

by Pierce Geary

Functional cleanliness can also be called chemical cleanliness. A surface that is chemically contaminated has substances present at the top few molecular layers that make bonding to the material difficult or, at the very least, will result in a weak and unreliable bond. For medical devices, uncertainty of this magnitude is unacceptable. Every device must function as designed and expected every single time.

A lot of certainty is built into the design of the manufacturing processes to build these devices and the validation of these processes help to ensure that they are on track to create consistent, high reliability devices.

There's more than one way to clean or prepare a surface and choosing the most effective one has a lot to do with the type of material and the type of bonding, i.e. gluing with an epoxy, sealing with FIPG, coating or painting metal, bonding polymers, etc.

This article highlights aqueous and chemical wash methods primarily used to clean metal components before bonding or coating. When performing these tasks within a medical device assembly process, the dual pressures of cleanliness (biological and chemical) are equally vital to yielding the safest and most effective medical devices possible.

The QSR 820.75 mandates monitoring at a determined interval and frequency, based on statistical analysis, but continuous monitoring is preferred. You should periodically evaluate the monitoring interval and frequency as well, especially if you change the process or uncover a deviation from the specification.

Parts washing technologies for metal components

Metal components in medical devices can be particularly difficult to clean. They are often unusual shapes with small crevices and blindspots that need to be cleaned. They will often be encapsulated with a polymer coating that needs to conform completely and perfectly around the metal.

For a device that is designed to exist within a human body for long stretches of time may have a titanium base that electronic components will be adhered to and then the whole package will be encapsulated with a highly lubricious, non-reactive polymer. It is critical that the electronics are bonded strongly and securely to the titanium and that the polymer can adhere to the device.

The machines tasked with cleaning metal parts have moved from what amounts to large-scale dishwashers to highly advanced ultrasonic aqueous baths and vapor degreasing systems. Ultrasonic parts washers are immersive tanks that pulse the solution or water a component is submerged in using high frequency sound waves to release contaminants from the surface of the part. Vapour degreasing systems are also immersive, but use an evaporated solvent to dissolve oils, greases and fluxes from mechanical and electronic parts.

Vapour degreasers are becoming more common as they are touted as being more economical and safer for the environment. The later point isn't necessarily accurate since many of these machines are being used with halogenated solvents which are being found to be harmful to patients, manufacturing employees and the environment. The EPA is putting restrictions on their use and have already banned them from inclusion in consumer products such as paint remover.

These changes are always good to stay aware of because changing the solvents used can have a major impact on the wash efficacy.

To control washing systems that include a spray mechanism, many manufacturers will very precisely dial in their nozzles to ensure the angles are the most efficient (cover the most surface area), the aggressiveness of the spray is highly controlled and that each nozzle doesn't have gunk buildup on the holes leading to errant spraying or improper pressure.

One thing manufacturers using aqueous baths often overlook is the dangers of a recirculated wash fluid. This can be an extremely cost-efficient wash method but, if left unchecked, could be contaminating parts as they are introduced to the bath. Manufacturers will often test for bioburden at these stages, which the solvents in the baths will usually take care of, but if they are not testing the chemical state of the surfaces of parts that come out of these washers, they may see issues downstream when they need to bond to these components.

Testing for adhesion-resistant contamination before and after washes will resolve this issue and flag when recirculated fluids are no longer producing coating-ready surfaces.

Similarly, vapour degreasers are a version of a solvent bath that functions on the principle of reusing the same solvent over and over. In this method the temperature of a solvent bath is raised by a heating coil and the vapor emanating from the solvent rises into a chamber that is holding the part being treated. The solvent vapour removes the contaminant by condensing on and then dripping off the surface of the part, breaking

up and removing contaminants. Often the solvent is recovered and reused. This process needs to be closely monitored to ensure that the solvent is properly distilled and contaminant free when reused. The solvent also needs to be suitable for the material and entirely rinsed off before adhering to the part.

Chemical contamination testing needs to be done in a quantifiable manner using a technique that is reliable and repeatable so it can be used to fully verify the products and be documented to satisfy FDA regulations.

Built-in controls might not test for contamination loading

Testing for various kinds of contamination takes place with these baths, but many of them are only inspecting for the kinds of biological organisms mentioned earlier. There are also sensors in the baths to control parameters such as temperature, fluid volume, the ultrasonic pulses, etc. They are not necessarily testing for contamination loading in the wash solution. As contaminants are removed from the surfaces of the metal, they go directly into the fluid the parts are sitting in and, without proper monitoring, these contaminants could transfer to subsequent parts.

A useful rubric for what elements need to be controlled in a cleaning operation is TACT:

Temperature: many wash solutions can be used at ambient temperatures but some still require some heating element. If the solution is too hot it could warp some materials and will have an effect on the drying time.

Agitation: controls the type of movement of the solution in the wash system. The type of agitation is a predominant basis for what kind of fluids are used. Some spray systems need a low-foaming detergent, and the type of solution in an ultrasonic bath and vapour degreaser are different because of the type of agitation employed.

Concentration: controlling the ratio of detergent concentrate to water can have an effect on parts forming rust or how effective the rinse cycle is afterward.

Time: time covers the entire wash process, i.e. pre-wash, number of wash stages, number of rinse stages, and drying time. To remove all biological and chemical contaminants, solvents need time to fully kill microbes or remove residues.

Parts washing and ultrasonic cleaning can be effective to ensure parts are chemically clean, but the effectiveness of the cleaning process is influenced by many factors: because parts can enter the washing process in various states of cleanliness, the effectiveness of the washing process may not be sufficient for excessively soiled or contaminated parts.

The quality of the cleaning solutions degrade as parts are cleaned. If the cleaning solutions are not monitored and changed as appropriate, the cleaning process loses its effectiveness.

Washing systems that include sprayers have a greater tendency to not clean uniformly depending on where the sprayer is actually directed at on the part being washed. Sometimes this is adequate but for applications requiring high precision cleaning a spray wash may be too variable in its consistency.

Parts entering the cleaning process are not always at the same baseline of clean and this is seldom recognised or compensated for.

Contaminants can be introduced after the washing process, and the surface quality of parts degrades over time as they are stored in inventory.

To ensure all these factors are tested and accounted for, make sure you are inspecting the chemical state of your surfaces throughout the entire cleaning and assembly process. Technologies exist that make this kind of product verification easy and fast and are designed to be used directly on real parts in production settings without biologically contaminating the surfaces.

To learn more about verifying the effectiveness of your cleaning process by measuring surface quality as it relates to adhesion, download the eBook "How to Streamline Process Design to Production for Medical" about verification techniques.

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Gentle and effective ultrasonic cleaning for sensitive substrates

New SonoPower 3S megasound system from Weber

Sensitive components such as monocrystalline wafers from the photovoltaic and semiconductor industries as well as optical lenses and prisms and super-finely structured substrates place tough demands on component cleaning. The tiniest of contamination must be reliably removed without compromising the surface. For these demanding cleaning tasks, Weber Ultrasonics has developed the intelligent SonoPower 3S megasound system with frequencies from 500 to 1,000 kHz.

In numerous industrial sectors such as the photovoltaic and semiconductor industries, micro and medical technology and optics, parts and components are becoming ever smaller and finer and with it, more sensitive to soiling. Component cleaning, which is usually performed with ultrasound, poses a particular challenge to this method. On one hand, even the tiniest particulate soiling and minimal film contamination must be reliably removed to ensure perfect functioning of the sensitive parts and components. On the other hand, damage to or impairment of the surface caused by cleaning must be avoided at all costs. They must not be subjected to either excessive movement in the medium or to excessively high levels of cavitation energy.

The SonoPower 3S Megasonic Boost generator available in the frequencies 500 and 1,000 kHz and in the power classes 250 and 500 watt enables gentle yet effective and efficient cleaning of sensitive parts and components

Gentle on the surface, effective against soiling

With the new SonoPower 3S megasound system with frequencies of 500 and 1,000 kHz, Weber Ultrasonics has developed an efficient solution for cleaning these sensitive components. It ensures especially gentle and yet effective handling of the components with high levels of cleanliness. The system consists of the intelligent SonoPower 3S Megasonic Boost and the matching SonoPlate HF high-frequency transducers.

In operation, the generator, which is available in the power classes 250 an 500W, employs various innovative features to ensure that cleaning is gentle on the surface while soiling is removed reliably. These include the combined frequency and amplitude modulation, which guarantee homogeneous sound fields and thus prevent standing waves. The SonoScan automatically determines and sets the optimum operating frequency and monitors and adjusts it during the process. This guarantees that the ideal power output is always applied, even in the face of changing operating conditions such as temperature fluctuations or when cleaning and rinsing media are changed. The adjustments are made during running operation, which ensures uninterrupted operation.

Another special feature of the SonoPower 3S Megasonic Boost is the mains voltage management. As it automatically compensates for voltage fluctuations, maximum process stability and operational reliability are guaranteed. The power output can be continually adjusted from 10 to 100 percent, which allows it to be ideally adapted to the respective component.

The optional Profinet interface integrated in the generator not only enables remote operation, whereby the ultrasound-specific process parameters are precisely controlled and documented during cleaning; the SonoPower 3S Megasonic Boost is also Industry 4.0-compatible. Another advantage is the compact design, which enables it to be easily integrated into 19" control cabinets.

Optimally adapted to the generator, the new SonoPlate HF high-frequency transducers enable an effective cavitation current and thereby efficient further processing of the clean components. The transducers are tailored to the standard dimensions of the wafer industry as standard and can also be produced in other sizes upon request.

Optimally adapted to the innovative features of the generator, the new SonoPlate HF high-frequency transducers ensure optimum ultrasonic output and thereby cavitation current

Weber Ultrasonics AG develops, produces and markets solutions and components for ultrasonic technology in industrial use. Its business area focuses on cleaning, welding, and cutting with ultrasound and includes other special applications. The company is certified to DIN EN ISO 9001 and has received multiple awards for exemplary corporate governance. The family-run, medium-sized firm based in Karlsbad, Germany employs over 130 people worldwide. Weber Ultrasonics AG owns subsidiaries in the USA and Asia as well as Weber Entec GmbH & Co. KG based in Waldbronn (Germany), which specializes in ultrasound-based plant technology for biogas and sewage treatment plants.

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Are all parts washers the same?

It is important to consider all the features of a parts washer when comparing models available on the market. The cheapest purchase price will often have the most expensive operational cost. They normally use a solvent based cleaning solution that has environmental and operator usage liabilities, as well as increased waste disposal costs. Performance can be slow, as economy parts washers use wash pumps with very low output pressures and flow rates to save cost.

Teknox has been making parts washers since 1967. Its reputation worldwide is for quality manufacturing of reliable and fit for purpose manual parts washers, even for intermittent usage in such areas as maintenance departments, small batch manufacturing production areas and pre-quality control inspection areas.

When choosing any parts cleaner, always consider these features:

Cleaning solutions - wherever possible use a non-hazardous cleaner. Teknox recommends water-based cleaning solutions, unless you have a solvent-based contaminated product. It even has a VOC free solvent option for this type of application as well. Thewe water-based cleaning solutions lift the contaminates away from the product.

Heat substantially accelerates the contaminate separation process and provides residual warmth to dry off the products after cleaning.

The cleaning agitation effect is normally generated using a manual washing brush to remove the contaminate, but this type of cleaning will only clean the flat surfaces or shallow areas and involves operator time and his dedication to fully clean an item.

Teknox has developed a manual parts washer that can be easily adjusted up to 60°C degree temperature and up to 9 bar adjustable washing pressure to gently blast away oil and other contaminates very quickly, reducing the operators washing time.

The washing spray can also be used to clean away machining swarf from castings before a quality control inspection. As standard Teknox fits a compressed air blow gun for drying off the products. This reduces the risk of wet and dripping products being removed from the washer.

Teknox Open Lavapen 230/50/1

Teknox quality parts washers are made of Aisi 304 stainless-steel and can be enhanced further by a number of user options depending on your cleaning requirements, such as the use of Bio-remediation cleaners that will digest the waste oil removed from the products and turn the waste oil back into water. Reducing the on cost of service and waste disposal costs further.

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SuperCORR is solving problems across industry

Originally developed for the US Air Force to comply with MIL L-87177A as a water displacing lubricant, corrosion protective to prevent avionic as well as electrical and electronic components and systems failures caused by corrosion, SuperCORR A aerosols, supplied by EnviroTech Europe, are now the industry standard for in service maintenance by military and commercial airlines and MRO facilities worldwide. SuperCORR A is a unique formulation with a long-lasting, anti-corrosion inhibitors and components providing a superior lubrication coefficient and protection against moisture, wear, general and fretting corrosion, static electricity, corona, and other electro migration problems.

The non-flammable lubricant film is only 7 microns (0.0007") thick and is formulated without sulphates, chlorides or halogens to meet the EU RoHS directive. It is unexcelled in preventing deterioration and contamination of all electronic equipment and metal components surfaces.

SuperCORR A is very effective at preventing corrosion of electronic and electrical equipment in demanding work environments, for example aerospace, rail and road transport, marine, oil & gas industries, waste water treatment plants, electrical power facilities, paper and pulp mills, as well as other environments where corrosive gases such as salt laden air or hydrogen sulphide are present.

A major aerospace and turbine manufacturer is currently completing trials with SuperCORR A to protect parts in transit and storage worldwide under variable temperature and humidity conditions, to prevent corrosion during long term storage and transportation. The protective film is self-sealing during movement and handling and can be removed before use if necessary.

SuperCORR A is used for routine lubrication and anticorrosion maintenance in the harsh conditions experienced at sea.The aerosol cans make access to engine parts easy for the engineering crew in difficult locations and conditions. Unpainted mild steel will not rust on exterior surfaces directly exposed to sea water spray for at least six months protecting electrical connectors, switches, chains, drive shafts from corrosion while maintaining lubrication on moving surfaces.

In another interesting application, SuperCORR A protects the metal edges of the composite blades on wind turbines. These are subject to continuous corrosive effects of wind, rain and salt laden sea spray which erodes and corrodes the metal. The protective film produced by SuperCORR A

is impervious to water while lubricating the airflow across the blade edges and preventing corrosion of the metal.

Critical fall arrest equipment is used on wind turbines and other tall structures where engineers are working at great height and exposure to high winds, Corrosion in the bearings, chains, clutches and wires used in the arrester mechanisms can lead to failure and potentially serious injury or loss of life. SuperCORR A protects against corrosion in these safety critical components.

Portable diesel and LP generators are widely used in construction, oil, gas and mineral extraction industries and aircraft servicing often in remote, hostile environments connecting and disconnecting supply cables, often many times a day. Seals prevent water, sand or dust entering connectors, but the flexing of the cables allows sufficient movement between the metal surfaces of the connector pins to produce fretting corrosion. A simple spray between connections ejects water and particulates and protects and lubricates the contacts improving reliability of supply.

Building and construction industries offer other unusual uses for SuperCORR A. Unpainted hatches, grilles, and window furniture are galvanised if manufactured in steel and anodised if aluminium or a zinc alloy. Once installed, exposure to wind and especially acidic rain dulls surfaces and produces unsightly white surface corrosion. An onsite spray with SuperCORR A on completion of the installation protects the surfaces with an invisible film.

In all forms of transportation from Amtrak trains, lightweight rail systems and for protection of equipment and services for underground tunnels and systems, as well as trucks to motorsport, electric cars and emergency vehicles, SuperCORR A is used for protection and lubrication of connectors, electrical systems and switches and mechanical controls during servicing. The ability to displace water from exposed contacts can ensure reliable operation in extreme conditions all in one small aerosol can. EnviroTech Europe provides a complete range of metal cleaning and surface treatment solutions which are cost effective, energy efficient, safe for operators and the environment.

EnviroTech Europe is a specialists in all aspects of metal and plastics cleaning, pretreatment for finishing and surface protection and has a qualified network of expert distributors throughout Europe, ensuring high levels of customer attention and technical support. It has the complete answer for the cleaning and preparation of metal, plastic and composite surfaces ready for finishing by electro plating, painting and powder coating.

For more information on SuperCORR A, visit **www.corrosion-protect.com**. To discuss the use of SuperCORR A to solve your problems, contact:

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www.envrotech-europe.com

ActOn Finishing introduces the SPU-1

Claimed to be the most compact wet and dry surface finishing system available, ActOn Finishing, a leading surface finishing engineering firm headquartered in Coventry, West Midlands, now offers the SPU-1 vibratory finishing system. This Single Portable Unit is ideally suited for small batch works and delicate components and can be used as either a batch or a continuous system.

The SPU-1 is a vibratory finishing system, designed and manufactured in Britain, perfect for deburring, descaling, degreasing, cleaning, smoothing, radiusing, polishing and drying. This is both an excellent and economical finishing option, as it will allow customers to carry out wet and dry finishing applications in one unit.

Moreover, the SPU-1 has been built to produce a consistent finish in comparison with manual finish, hence there is no need to carry out rework so customers will avoid high part rejects rates.

This automated vibratory finishing system includes a VB1S vibratory bowl machine, a VBD1 dryer and an independent recirculation system and integrated water filtration. It has been designed with wear-resistant casted hot cured polyurethane lining, includes a storage area and it is available in 3-phase and 1-phase.

Parts are simply inserted in the VB1S machine and then processed with a specially formulated media and compound. Once the wet finishing process is completed, the parts are then transferred into the VBD1 machine in the preheated work chamber to be dried. The dust free agro product, used in the VBD1, is an excellent moisture absorbent media which also produces a stain free polished effect on parts. Components are then unloaded from the machine via the separation screen.

Key features and benefits include:
Portable unit.
Space-saving and economical option as there is no need to acquire a separate dryer.
Built in compound recirculation system.
Water/compound can be filled from the side of the machine.
British built high-quality product

Efficient in operation
Quiet in operation
Operator friendly controls
Low maintenance
Customised to suit user applications

Sid Gulati, operations director at ActOn Finishing, says: "We are pleased to add this machine to our range, as it allows us to provide cost effective solutions for low volume producers. The SPU-1 vibratory finishing machine can be moved around and connected within seconds. With the built-in recirculation system, it really is hassle free."

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Remove stubborn material from carriers and parts

Altus introduces a product to make conformal coating machine and carrier cleaning trouble-free

Conformal coatings are very important if printed circuit boards are to operate reliably in harsh environments. Choosing the correct material for this process is carefully considered during production. However, one associated area that is overlooked is the selection of a method to clean and protect capital equipment from conformal coating to make the process consistent and machine and carrier maintenance easy.

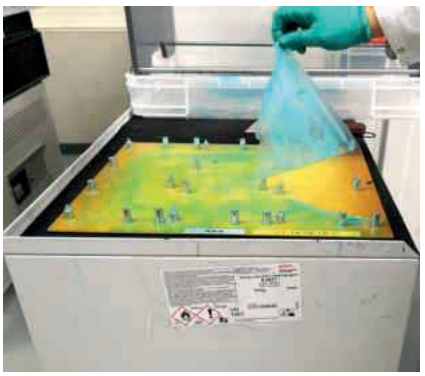
Conformal coatings are highly durable, which makes them very hard to remove from a PCB rework or repair. The same is true within a coating machine or on a carrier of a product. To make the task of cleaning equipment easy, Altus Group has now added Kolb CarrierSeal® to its portfolio.

Kolb CarrierSeal is a liquid sealing for coating/goods carriers, or within the chamber parts of a coating machine. The varnish or coating used within these machines is extremely difficult to remove. The residue adheres directly to the tools or within the chamber and takes a lot of manpower to remove. With CarrierSeal cleaning can be achieved easily by simply peeling off the sealing film, or machine cleaning prior to the coating process.

Matt Jones, sales director Altus Group, says: "If you have ever worked in a conformal coating cell or line, we are sure that you understand the difficultly of removing this resilient and stubborn material from the inside of your machine or from carriers and parts. Kolb CarrierSeal makes the job really simple. Cleaning can take place quickly and efficiently so the conformal coating process can continue effectively and production is not affected."

Kolb CarrierSeal can be used by simply applying with a brush to the carrier and its mounted build-ups. Alternately, the sealing film can be easily cleaned off mechanically in a suitable electronics cleaning system, like the Kolb stencil cleaning systems.

Altus now stocks Kolb CarrierSeal in a range of material sizes to support specific requirements. With the most advanced capital equipment available to the electronics industry, Altus also has Kolb's range of cleaning technology and innovative systems to ensure cleaning is achieved to the highest level.



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Wire mesh conveyor shot blast machine

The AGTOS product range

German manufacturer AGTOS offers a standard program of wire mesh conveyor shot blast machines in processing widths ranging from 400 mm to 1,600 mm.
The choice of the appropriate machine concept depends on your workpieces, the required level of performance and, last but not least, on your specific needs regarding an optimised production process.

In the event of a standard model not meeting your surface preparation needs, AGTOS will develop a tailor-made blast machine concept for you.

Operation

The workpieces first activate a switching threshold positioned in front of the blasting area's entry vestibule. This automatically releases abrasive to the already running high-performance turbines. This ensures that blasting takes place only when workpieces are actually in the blasting zone.

The entry vestibule is equipped with wear-resistant rubber curtains that prevent the escape of abrasive. After passing through the blasting zone, workpieces enter a blow-off zone. Excess abrasive remaining on the workpiece surfaces is removed and returned to the abrasive process loop.

The blasting abrasive is continuously cleaned, recirculated and reused. An abrasive metering device feeds the cleaned abrasive from the abrasive storage bunker to the high-performance turbines.

A fan unit creates the partial vacuum necessary to maintain dust-free operation of the blasting unit. Extracted air is cleaned in a special filter unit.

Capabilities and applications

Wire mesh conveyor shot blast machines are very flexible in their application. The fact that workpieces can be blasted simultaneously from above and below considerably increases the spectrum of work pieces that can be treated. Wire mesh conveyor shot blast machines are used for, among other things, deburring, descaling and cleaning of castings and laser cut parts.

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- Cleans by flow, not by impact and produces a 'softer' surface finish

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