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Vol. 15 No. 6 June 2019

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Double-Side Fine Grinding Machine



Peter Wolters AC 1250 Fine grinding wheel carrier in twin loader

Lapmaster Wolters, a member of the Precision Surfacing Solutions Group, offers its AC microLine 1250-F/H. It features maximum load pressure in process of 4000 daN and 70 kW servo drives.

The AC 1250 is a further development of the established AC 1200. The working wheel dimensions and epicyclic

workholder drive system grew compared to its predecessor. Accordingly, the machine base components have grown as well to ensure its rigidity and precision. Modern Siemens drive technology with up to 70 kW in combination with max. 4000 daN load pressure

Continued on Page 52

Sonics Celebrates 50 Years of Manufacturing



Robert Soloff announced that his daughter, Lauren Soloff, will be assuming the office of President, effective immediately, while he will be continuing in his role as CEO.

Sonics & Materials, Inc. celebrated its milestone 50th anniversary with a gala luncheon recently at its headquarters in Newtown, CT, marking 50 years of manufacturing in the state of Connecticut, as a supplier of plastics assembly systems and ultrasonic welders.

Sonics & Materials, Inc. was started in 1969 in Danbury by Robert S. Soloff (founder and ongoing CEO) and has been located in Newtown for the last 21 years, with a worldwide network of distributors and representatives, many of whom traveled from as far as China and South Africa to partake in the celebration.

At the luncheon, Robert Soloff announced that his daughter, Lauren Soloff, who joined the company

Continued on Page 85

ZEISS Acquires GOM

ZEISS is expanding the industrial metrology and quality assurance portfolio of its Industrial Quality & Research segment by acquiring GOM, a provider of hardware and software for automated 3-D coordinate measuring technology. "Both ZEISS and GOM have enjoyed strong growth in the past years and proved successful in the market," said a company spokesperson. "The aim is to further strengthen this leading technological position together, especially in the area of optical digitization systems. The combination of existing products and solutions as well as joint innovations in the future will lay the foundation for shaping and entering new markets."

Continued on Page 86

3-D Digital Display Technology

Vision Engineering Ltd has unveiled a globally patented, digital 3-D stereoscopic display technology.

Vision Engineering's deep reality viewer (DRV) is designed to create stereo high definition 3-D images without using a monitor, or requiring operators to wear headsets or specialist glasses: images 'float' in front of a mirror.

DRV offers users Vision Engineering advantages of ergonomics and optimized user interfaces, while ensuring full interaction with other local or remote users and other tools/PCs or complementary analytical equipment.

Continued on Page 86

Evolve Additive Solutions Will Grow Operations

Empire State Development (ESD) has announced that additive manufacturing (AM) systems company Evolve Additive Solutions will expand operations in the Town of Brighton, Monroe County, NY. The expansion at Evolve's Metro Park location will allow the company to create close to 60 new jobs in the region over the next five years. Evolve, which is headquartered in Minnesota, operates its materials technology center in Brighton, NY. The 15-person office is headed up by Kodak veteran Rich Allen,

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Feature Editorial



Aerospace/Defense

Parallel Kinematic Concept for Large Aluminum Components

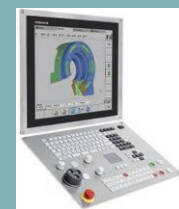


Parallel kinematic machines can mill very large and challenging aluminum components.

■ See Page 12

Controls/DRO

Lathe Control with New



Functionality

A new feature allows the creation of a lathe program with the push of a button.

■ See Page 32

Applying Technology

3-D Technology Reduces Lead Times

Highly complex bone reconstruction is now a reality.

■ See Page 44



Finishing/Grinding/Abrasives

Reduction of CO₂ Emission Through Form Honing

The goal of form honing is a form optimized cylinder bore under operating conditions.

■ See Page 50



Retrofit/Remanufacture/Repair

Machine Service and Spare Parts



Manufacturing facility rebuilds factory spindles.

■ See Page 68

Plant Maintenance

Structural Adhesive

Adhesive achieves up to 3x the strength at 150 °C compared to previous product generations.

■ See Page 76



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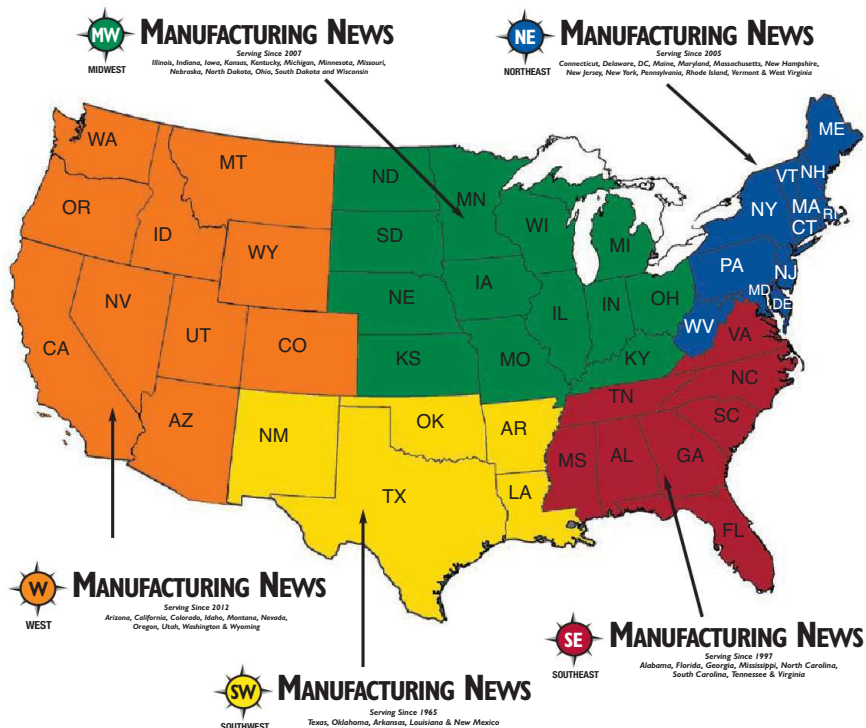
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Aerospace 5-Axis Machining Strategies Workshop June 12

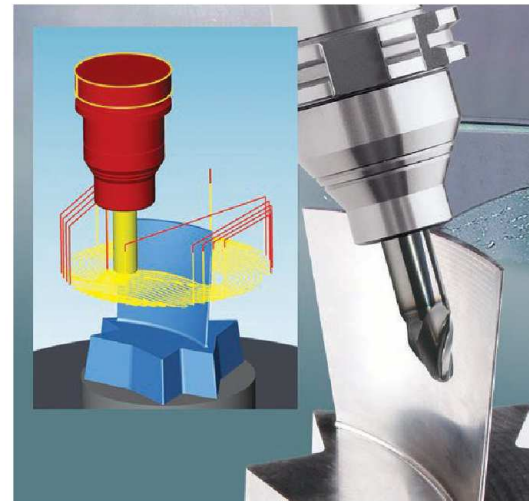
Cutting tool manufacturer Emuge Corp. and OPEN MIND Technologies USA, developer of hyperMILL, will hold a complimentary Lunch and Learn Workshop on Advanced Strategies for 5-axis milling. The event will be held on June 12, 2019, at Emuge's North American corporate headquarters and Technology Center located at 1800 Century Drive in West Boylston, MA, from 10 AM to 1 PM.

"Experts from Emuge and OPEN MIND will present strategies on how to reduce cycle times up to 90%, and significantly improve surface finishes and tool life by leveraging today's latest end mills and CAM software to maximize 5-axis machining," said a spokesperson. "Attendees will have short overviews on the latest cutting tools and software innovations, in addition to live custom milling demonstrations on a Hermle C 42 5-axis mill-turn machining center. A bladed component will be machined, and attendees will see first-hand how Emuge's Circle Segment End Mills (also known as conical barrel cutters), together with the OPEN MIND hyperMILL MAXX Machining performance package, can offer significant productivity gains when roughing and finishing." A catered lunch will be offered and a Q&A session will conclude the event.

"Our collaboration with OPEN MIND to develop Circle Segment machining has enabled dramatic productivity improvements for challenging applications, such as in aerospace. We are pleased to demonstrate this leading cutting tool and CAM software solution at the event," said Bob Hellinger, Emuge Corp. President.

"The Lunch and Learn Workshop

is an opportunity for attendees to consult with OPEN MIND and Emuge experts to solve their toughest aerospace milling challenges," said Alan Levine, Managing Director of OPEN MIND



Technologies USA, Inc.

Registration is limited. For more event details and to register, go to www.emuge.com/content/lunch-and-learn.

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Fiber Laser Cutting Machine with 12 kW of Fiber Power

With the new ByStar Fiber 12 kW, higher speeds and an expanded spectrum of applications are now possible. "The ByStar Fiber from Bystronic is being enhanced with a 12 kW fiber laser and a newly designed cutting head which enables the 'BeamShaper' option, ensuring consistent cutting quality on varied material

cost per cut part and shortest delivery times are decisive for achieving good production utilization. A laser cutting system with its specific components must therefore enable high processing speeds, a reliable cutting process and low maintenance costs. Those who position themselves this way are awarded jobs that gradually increase revenue



qualities up to 1.125 inch," said a company spokesperson.

"To compete for cutting jobs, sheet metal fabricators need to manufacture quickly, flexibly and cost-effectively," continued the spokesperson. "The best

and build the foundation for growth."

In order to optimally support sheet metal fabricators amid growing competition, Bystronic is now launching the next level of power in fiber laser cutting: the ByStar Fiber with 12 kW. "The high-end fiber laser represents precise Bystronic technology, a stable

cutting process up to the highest laser power, and a broad spectrum of applications," said the spokesperson. "It is an enormous technological leap from the 3 kW to 10 kW levels available up until now, to the new 12 kW."

With the 12 kW laser, the ByStar Fiber's cutting speeds increase up to 20% on average (when laser cutting with nitrogen) compared to the previously available 10 kW laser source. This increases productivity throughout the range of sheet thicknesses from .125" to 1.125".

Stefan Sanson, Bystronic Product Manager for Laser Cutting, explained: "This laser power is of interest to companies that want to achieve higher cutting speeds with material thicknesses starting at .125 inch and thicker, in order to increase their productivity per unit of time. The result is higher productivity with lower costs per part."

New Cutting Head Design for Process Stability

The cutting head is the core element for a stable cutting process and consistent high parts quality. This applies all the more with increasing laser power, which must be delivered to the cutting material precisely and reliably. To enable this, Bystronic has continued to expand the development of the ByStar Fiber cutting head.

A slimmer design for the new cutting head decreases the possibility of contact with cut features during the cutting process. Bystronic is also reducing the number of different components and accommodating important technical functions in the interior of the cutting head. The new design also decreases maintenance and operating costs because the integrated technology is better protected from contamination occurring from cutting dust, for example.

Bystronic reported that optimal cooling in the cutting head ensures consistent cutting performance, particularly for long-lasting cutting operations with high laser power. Bystronic thus protects the lenses and cutting nozzle from high thermal stresses.

High Cutting Quality for Materials up to 1.125"

"For sheet metal fabricators who want to expand their job volumes into the highest material thicknesses, Bystronic has developed a further innovation," said the spokesperson. "The new BeamShaper function enables exceptional cutting quality for steel up to a sheet thickness of 1.125 inch. This option can be selected with the purchase of a new ByStar Fiber or retrofitted at a later date. BeamShaper allows for an ideal adjustment of the laser beam profile to cut greater sheet thicknesses and variable sheet metal qualities. In materials up to 1.125 inch, the new function thus raises the quality of the cut surface and increases the cutting speed by up to 20%."

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www.bystronicusa.com

Grand Opening of Methods Precision Center June 5



Methods Machine Tools has announced the grand opening of its new Precision Center in Acton, MA. The facility features a state-of-the-art, climate-controlled environment that monitors and maintains temperature, air pressure and humidity within the space at very precise ranges at all times. The precision center also features secured airlock en-

trance and exit to maintain complete environmental stability and isolated, 1 m deep, steel-reinforced foundations to eliminate vibration and other physical interference.

The grand opening will take place June 5, 2019, beginning at 2 PM, and will include short speeches featuring local and national industry experts, a Kagami

Biraki celebration and tours of the facility. Attendees will include representatives from Methods' international builders, local legislators, customers and media personnel.

"The grand opening on June 5 will provide attendees the opportunity to tour the new facility and see first-hand the investment made and what it brings to the industry, our machine builders and our customers," said a company spokesperson. "No longer do North American manufacturers need to send parts, tooling and material to Japan or somewhere else to have their intricate, sensitive or challenging test cuts performed."

For more information contact:
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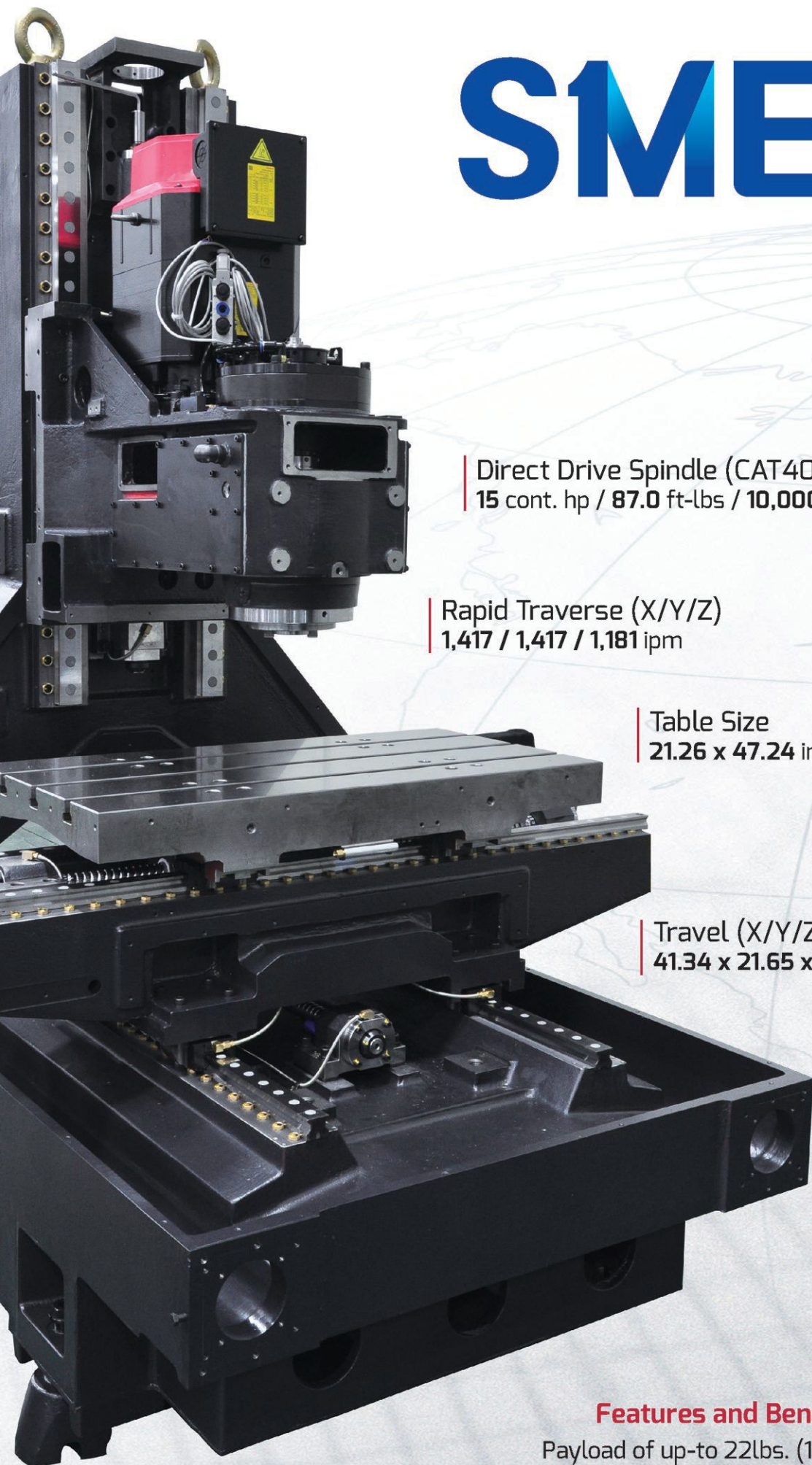
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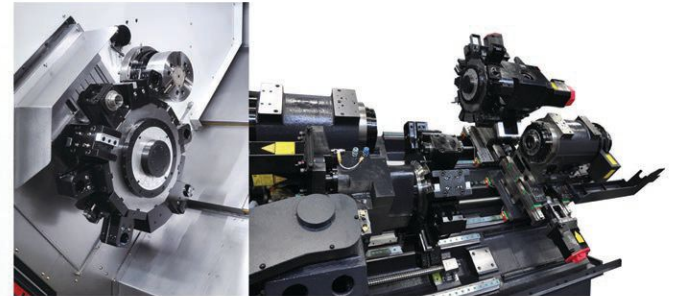
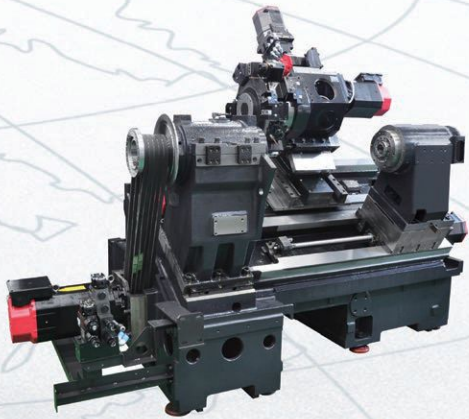
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Samsung Machine tools Engineering Company

Brief History

- 1988 Started as **Samsung Heavy Industries** Machine Tools Division
- 1989 Horizontal and Vertical Machining Center Technology Partnership with **OKK Japan**
- 1991 Turning Center and Vertical Machining Center Technology Partnership with **Mori Seiki**
- 1996 5-Axis Machining Center Technology Partnership with **Toshiba**
- 1999 Spun out from Samsung Aerospace Industries and established **SMEC Co., Ltd**
- 2018 Established **SMEC America Corp** in the US to support North and South America Markets



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OptiPro to Host Technology Open House on June 19-20

OptiPro Systems, LLC, a provider of precision CNC machine tools and Mastercam software in New York State, will be hosting its Technology Open House and Steakout on June 19-20, 2019, at the company's newly-expanded headquarters in Ontario, NY. The event is highlighted by the grand opening of its new 15,000 sq. ft. Machine Technology Center. A ribbon-cutting ceremony for the new center will take place on Wednesday, June 19th at 9:45 AM, with the open house beginning at 10:00 AM both days.

"We are excited to unveil our new Machine Technology Center and Mastercam Certified Training Center to the Upstate New York manufacturing community," said Mike Bechtold, President of OptiPro. "Our new space will allow us to showcase more machines and more product solutions to help our customers maximize profitability."

Nakamura-Tome, FANUC, Kiwa, Yasda, Hyundai-Wia, Flow Waterjet



See ultra-precision milling demos on the Yasda YMC650 Micro Center at OptiPro's Open House event on June 19-20.

and Switek machines will be running unique demonstrations, giving attendees the chance to experience cutting-

edge machining capability. The company's new Metrology Center will also be highlighting demonstrations of the latest Vision Systems from ZEISS O-Inspect and Starrett Precision Metrology.

In conjunction with our grand opening, OptiPro will be offering short courses on Mastercam 2020, the latest release of the CAD/CAM software.

Throughout the two-day event, experts in the manufacturing industry will give technical presentations and demonstrations focusing on specific machines, machining techniques, fixturing, tooling, accessories and consumables to enhance manufacturing productivity and improve part precision.

OptiPro is extending an invitation to all current and potential customers to attend the ribbon-cutting ceremony for the grand opening of its Machine Technology Center. All are welcome to stay for lunch or dinner. For more information and to register, go to www.optipro.com/technology-open

house.

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U.S. Cutting Tool Consumption Up 8 Percent In February

February 2019 U.S. cutting tool consumption totaled \$205.6 million according to the U.S. Cutting Tool Institute (USCTI) and AMT – The Association For Manufacturing Technology. This total, as reported by companies participating in the Cutting Tool Market Report (CTMR) collaboration, was down 4.4% from January's \$215.1 million and up 8% when compared with the \$190.3 million reported for February 2018. With a year-to-date total of \$420.7 million, 2019 is up 13% when compared with 2018.

These numbers and all data in this report are based on the totals reported by the companies participating in the CTMR program. The totals here represent a significant market share of the U.S. market for cutting tools.

"The 8% year over year increase posted in February reflects the continuing strength in the U.S. manufacturing base. We are hearing of signs that the market's growth rate may slow later this year but February's results are getting the year off to a good start," said Phil Kurtz, President of USCTI.

According to Greg Daco, Chief U.S. Economist at Oxford Economics, "Cutting tool shipments are off to a solid start in 2019, bucking the trend of cooler momentum in the broader durable goods category. A very solid 13% gain in year-to-date cutting tool shipments through February puts the category well ahead of the healthy 6% year-to-date rise in overall durable goods shipments.

Leading manufacturing activity indicators point to healthy, but gradually cooling momentum in 2019. Slower global growth, lingering trade tensions and reduced fiscal stimulus will weigh on growth while elevated private sector confidence, a solid labor market and a more dovish Fed support activity."

The CTMR is jointly compiled by AMT and USCTI, two trade associations representing the development, production and distribution of cutting tool technology and products. It provides a monthly statement on U.S. manufacturers' consumption of the primary consumable in the manufacturing process – the cutting tool.

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Parallel Kinematic Concept for Large Aluminum Components



Starrag offers its Ecospeed machining centers featuring patented parallel kinematic drives that replace conventional fork heads in drives. "With these exclusive parallel kinematic machines, users in the aerospace industry throughout the world are now milling very large and challenging aluminum components from solid metal," said a company spokesperson.

Sprint Z3 and the parallel kinematic concept: three parallel linear axis

drives are mounted radially equispaced in a barrel-shaped headstock. The spindle platform is connected to each drive by means of rigid levers with a simple pivot at one end, and a ball joint at the other end. A high-performance motor spindle is mounted to the spindle platform. The headstock is mounted horizontally and moves vertically inside the column. "This arrangement offers minimum movable

Continued on Page 18

Tube Bending with Controlled Wall Thinning



All sequences can be programmed easily on the t bend-mandrel bending machine from transfluid. The operator can assign them to a product and recall them when needed.

"Safety is an issue that is extremely important in the aviation and aerospace industry, perhaps more so than in any other industry. Therefore the demands are very high, including areas such as tube processing," said transfluid Managing Director Stefanie Flaeper. "There is often demand for fast production processes of small batches of complex components, of course. In addition, high- and ultra-high strength materials are an important matter for

tubes that are more lightweight and that can be subjected to greater loading. What makes the development of tube processing technologies for the aviation and aerospace industry particularly interesting is that there are always new technical milestones that require sophisticated solutions. Such as the project that the company is working on at present for a manufacturer of airplanes."

Continued on Page 14

Grinding Solutions for Aerospace

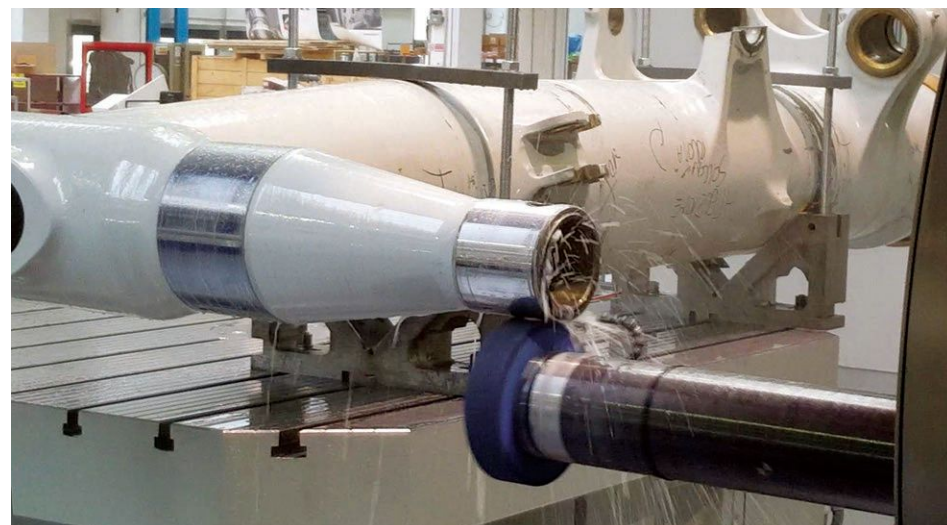
AZ provides a complete range of grinding machines for the manufacture and maintenance of critical components of aircraft engines and landing gear.

The machines can be equipped with a wide range of wheel head configurations, straight, angular and B-axis. The integration of O.D. and I.D. grinding in one machine reduce the machining cycle time. Conventional, CBN and diamond grinding wheels allow grinding of different materials and surface treatments including chromium and HVOF. The grinding wheels feature an identification

microchip that allows the installation without errors. The machines can be equipped with gap bed to allow for large diameter swing components. The counter-weighted work head balances asymmetric workpieces and offers a maximum swiveling diameter up to 6 m.

"The most advanced technology is used on the machines, including: in-process measurement device to prevent run-out, shape error detection, Automatic wheel balancing system, probing for different position measuring, automatic

Continued on Page 14



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Ultra-Precise Laser Machining Center

Synova, a Swiss-based provider of advanced laser cutting systems, offers a CNC machine with full 5-axis capability to process complex 3-D geometries. Applications targeted include the machining of industrial diamond employed in toolmaking as well as various composite materials used in aviation. The LCS 305 offers enhanced accuracy, quality and speed with highly dynamic axes, water-cooled linear and torque motors, mineral casting machine bed and fully automatic off-set calibration system.

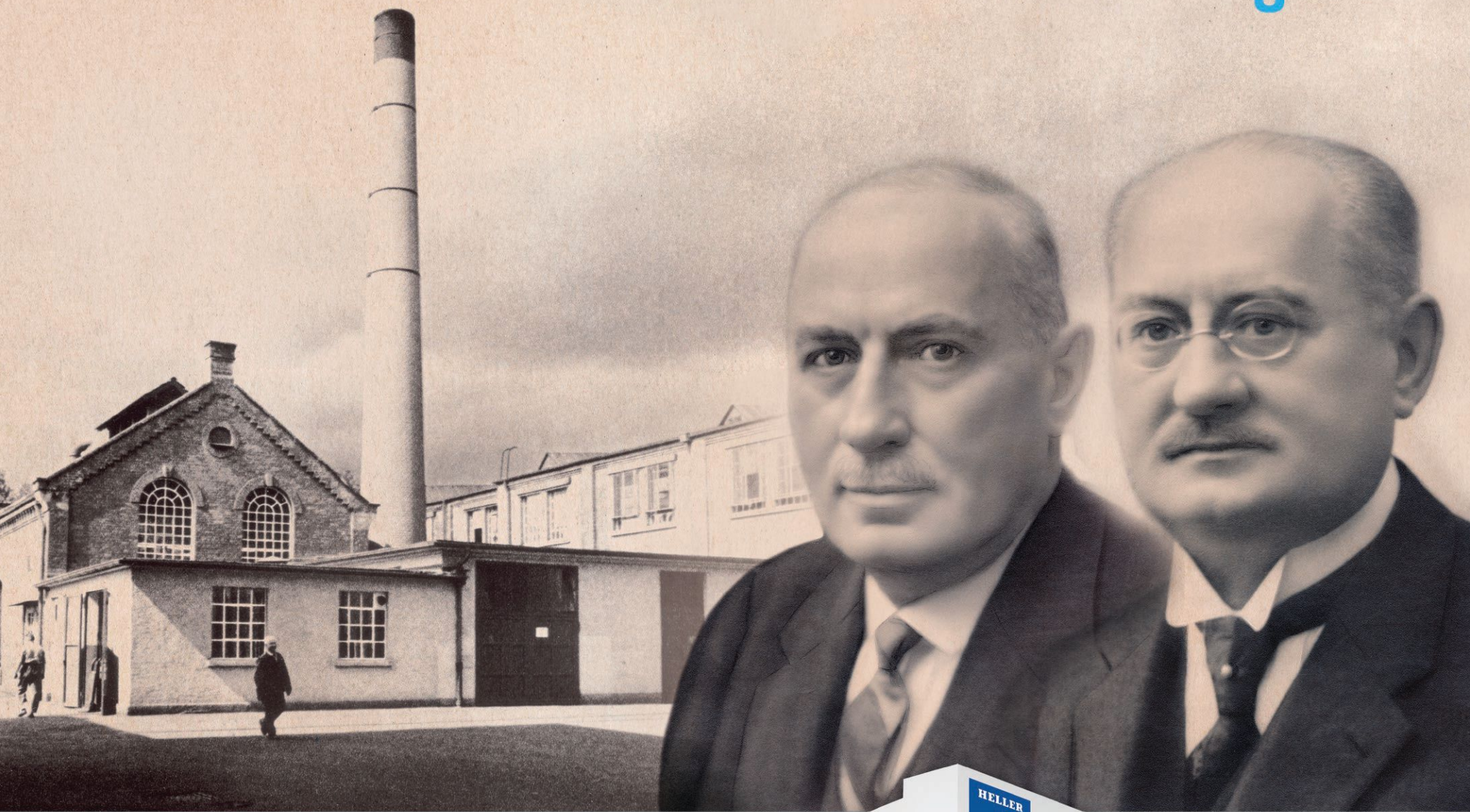
The flexible Laser MicroJet (LMJ) system enables 3-D cutting and shaping of large and multi-tooth diamond tools resulting in

Continued on Page 14



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Tube Bending with Controlled Wall Thinning

Continued from Page 12

The new, specially designed t bend mandrel bending machine from transfluid is capable of bending titanium, aluminum and stainless steel tubes with a diameter of up to 60 mm and a wall thickness of 0.5 mm - 1.5 mm. Furthermore, the design makes it possible to achieve a radius of 1xD.

Axis Synchronization Through Smart Sequential Control

The other stand-out feature is the option to control the wall thinning. This is where safety plays a key role with regards to the later application of the processed tubes in the airplanes. The wall thickness has to meet the specifications after the bending too; the flow through the workpiece and its stability have to be preserved. That is why the transfluid engineers have developed the push bending option for the process. The controlled push bending is applied during the last bend through a controlled inner tube.

"All the electrical axes are equipped with servo-electrical motors and their drives can be neatly synchronized," said Flaeper, about the technical details. "A key benefit is the complete synchronization of all the moving axes in different sequences, which is what makes our new sequential control possible." This separates each movement of all the axes and moves the different units at the right time. That way it is possible to gradually introduce a bend with ease

and either push or slow down with the required power.

Customized Storage of Production Data and Protected Retrieval

All the sequences on this innovative mandrel bending machine are easy to program. The operator can allocate them to the product and retrieve them as needed. In addition to the actual process, the sequencing will also take into account the material, radii and manufacturing processes of the product.

All control aspects can be accessed via the network. This allows the desired geometries to be taken from the CAD software and the data from the impact test be recorded in the same way. The measuring unit can be connected to the system too, depending on the size of the lots and batches. The sequence control will also store the relevant data for the production, as defined by the customer. They can then be recalled and processed with a password and the correct authorization. Furthermore, the machine's software and all the control components, as well as the control panel (MMI), are compatible with Industry 4.0. These particular features make it possible to set up the machine with almost no operator intervention.

For more information contact:
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sales@transfluid.de
www.transfluid.net

Grinding Solutions for Aerospace

Continued from Page 12

shape control, taper correction," said a company spokesperson.

To grind heavy duty asymmetrical landing gears, AZ has designed a new orbital grinding machine that features a rotary table that allows grinding of

all sides of a component without work-piece displacement.

For more information contact:
AZ SpA
info@azspa.it
www.azspa.it

Ultra-Precise Laser Machining Center

Continued from Page 12

smooth cutting surfaces and sharp edges for ultra-hard materials such as PCD, SCD, natural diamond or tungsten carbide. The machine's two highly dynamic torque motor driven rotary axes also allow chamfering for K-land edges and single or multiple clearance angles. Tools can be exchanged quickly and with a high degree of accuracy due to the HSK 63 toolholder.

"Only the LCS 305 laser system with water jet guided laser technology is capable of precision machining parts made of ceramic-matrix composites (CMC, a composite made of SiC) while protecting the material from heat-related effects," said a company spokesperson. The low weight and heat-resistant new material is used for hot section aero-engine components to increase aircraft efficiency. "The issue of heat affected zones and micro-cracks is greatly alleviated when using Synova's unique Laser MicroJet systems because of the inherent heat dissipation properties of the water jet," said Dr. Bernold Richerzhagen, Synova Founder and CEO.

"The LMJ has already been successfully deployed for the drilling of holes and cutting of CMC shrouds and has proven the necessary precision and reliability required for such applications," added Richerzhagen.

The LMJ "wet laser" technology cools workpieces while efficiently washing away debris. The water jet maintains the laser's focus creating a cylindrical laser beam that results in parallel walls and tight kerf widths.

The LCS 305 is a complete CNC system that includes the SynovaCut 5.0 CAD/CAM software and SmartFactory functions such as an integrated laser power meter, positioning sensor and automatic jet angle correction. It can be flexibly incorporated into production as either a standalone system or into automated lines for operator-free high-volume production.

For more information contact:
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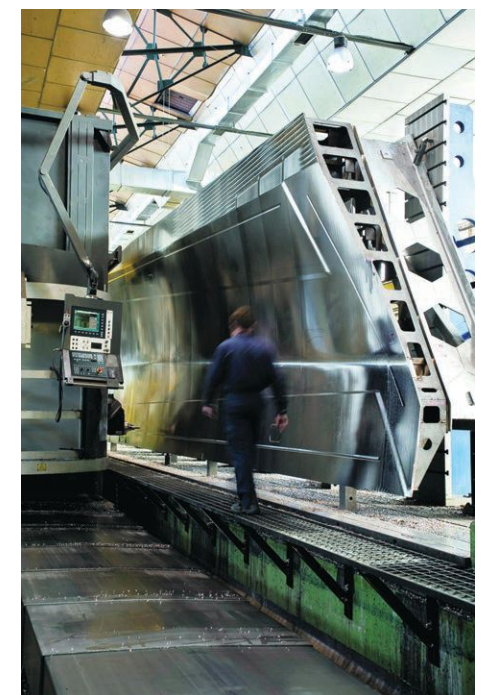
Fagor Automation Becomes Member of CFAA

Fagor Automation CNC controls and high precision encoders have been used to create parts for both aeronautics engineering and astronautics engineering. For this reason, the governing board of the Business Association for the Development of Advanced Aeronautical Manufacturing Techniques (AEDTFAA) has accepted the incorporation of Fagor Automation as a full member.

Being a member of this group automatically grants membership to the Advanced Aeronautical Manufacturing Center (CFAA). The CFAA is a public-private initiative dedicated to the development of manufacturing projects. It was founded from the inspiration and support of the Basque Government, through the Department of Economic Development and Infrastructures in Spain, and the Provincial Council of the Basque Country at the request of a group of companies in the sector led by ITP and Danobat. This project was later joined by the Biscaya technology park, as manager.

Being a member of the CFAA, Fagor Automation can now collaborate with aeronautical industry leaders, supporting Advanced Manufacturing projects in the field of Industry 4.0.

"The goal of Fagor Automation joining CFAA is to provide the aeronautical industry with the latest advances in automation and control systems, encoders with nanometric resolution, connectivity, monitoring and optimization



of processes, predictive maintenance, advanced programming, additive manufacturing and ultra-precision machining," said a company spokesperson.

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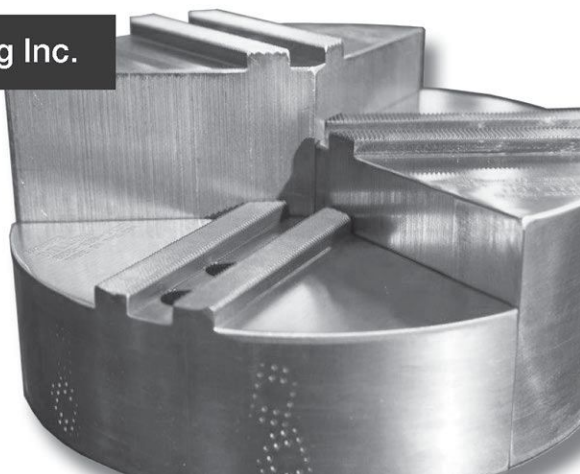
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Parallel Kinematic

Continued from Page 12

mass, resulting in unprecedented dynamic characteristics," said the spokesperson.

When all three axes are moved equally and simultaneously, the spindle is moved in a straight line in Z-direction. If the three axes move differentially, the spindle platform will be tilted in the A/B kinematic. Synchronized motion of the three Z-axes allows the spindle to describe any path within a spherical cone of $\pm 45^\circ$.

All machines in the updated Ecospeed range are now available with the

latest modules of Starrag's Integrated Production System (IPS). The IPS platform is based on the customer's individual task definition to provide the desired added value with a variety of features, systems and services. "Starrag has already used these IPS components to develop interesting and wide-ranging Industry 4.0 solutions in combination with Ecospeed flexible manufacturing systems," said the spokesperson.

All machines in the Ecospeed range feature 161 HP, 30,000 RPM, 61 ft-lbs. motor spindles and have the option of a C-axis, allowing the use of automatic interchangeable angular milling heads.

For more information contact:

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ussales@starrag.com
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Turn-Mill for Complex Geometries

The INDEX G220 turn-mill center includes a motorized 5-axis 18,000 RPM milling spindle and a tool turret with a Y-axis, providing maximum machining flexibility for producing complex parts in a single set-up from bar



stock up to 90 mm in diameter or via a maximum chuck diameter of 210 mm. The distance between spindles is 1,280 mm, and the maximum turning length is 1,000 mm. The high-accuracy, single set-up capabilities of the machine benefit users in the precision parts industries, including automotive, aerospace and mechanical engineering.

The G220's fluid-cooled, identical main and counter spindles provide power of 31.5/32 kW (100%/40%), a torque of 125/170 Nm and a maximum speed of 5,000 RPM. The fluid-cooled, 5-axis motorized milling spindle is available in both HSK-T40 and HSK-T63 configurations. The HSK-T40 version offers power of 11 kW, torque of 19/30 Nm and speed of up to 18,000 RPM, while the HSK-T63 version offers power of 17 kW, torque of 62/90 Nm and speed of up to 12,000 RPM. Both milling spindle options feature hydrostatic bearings in the Y and B axes, and a stable circular guide further ensures enhanced rigidity and damping. The Y-axis features a ± 80 mm stroke, while the B-axis is driven directly by a torque motor and has a swivel range of $-50/+230^\circ$. With a large travel distance in the X direction, machining at up to 30 mm below the turning center height is possible.

The motorized milling spindle operates using a one-row tool chain magazine which features space for 70 tools for the HSK-T40 configuration or 50 tools for HSK-T63. An optional double-row tool magazine enables set-up during machining and accommodates twice as many tools as the standard solution.

A tool turret is located in the lower part of the machine and can accommodate VDI 25 and VDI 30 tool mountings in 18 or 12 stations, respectively. All stations can be equipped with individually driven tools with power of 6 kW, torque of 18 Nm and a maximum speed of 7,200 RPM.

The compact machine features a CNC-controlled, programmable gantry-type removal unit for finished workpieces. It can unload remnants from the main spindle and finished parts from the counter spindle. The G220 offers a generous work area, providing operators easy access to the main and counter spindles, the turret and the

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motorized milling spindle, as well as the operating panel.

The G220 offers high user friendliness and process reliability with the latest generation of the INDEX C200 sl controller. Based on the Siemens Sinumerik 840D sl (solution line), the G220's control features an 18" touch-screen and incorporates the INDEX iX-panel operating system that expands operator support. As part of the iX-panel platform, the control includes an i4.0 button that toggles the screen between a traditional operating strip and activity-oriented display.

Additionally, the operating panel can do more than just operate the machine, as it includes a second input which can be used for INDEX's optional Virtual Machine (VM) program simulation. By pressing a button, the operator can instantly switch to the VM environment and make use of simulation, irrespective of current machine operations.

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Five-Axis 2-Pallet HMC for Challenging Materials

Methods Machine Tools, Inc offers its YASDA YBM 7Ti 5-axis CNC horizontal Jig Borer with a 2-position automatic pallet changer.

"The YASDA YBM 7Ti features the industry's highest accuracy and performance required to machine the most difficult-to-cut materials," said a company spokesperson. "A unique rotary table design and exceptionally rigid machine structure provide high performance machining of heat-resistant materials, such as titanium and Inconel. To ensure high accuracy levels, the YBM 7Ti has hardened box guideways and a 10,000 RPM, 50-taper direct-drive spindle." The machine is also available with a 6-pallet APC.

"The rotary table on the YBM 7Ti

offers four times the rigidity compared to other rotary tables. With a unique table design, there is ample room around the pallet which provides smooth table movements and allows operators to get a closer and clearer view of their parts," continued the spokesperson.

The YASDA YBM 7Ti features a 25-ton, H-shaped steel machine base for absorbing cutting forces and minimizing any machine vibration. All axes have hand-scraped, hardened box guideways for high accuracy when making challenging cuts. Hardened, ground and lapped guideways enable rapid feeds of up to 48 m/min, yielding high accuracy throughout every full stroke. "To achieve maximum performance levels, the mating faces of the guideways are approximately double the width of more traditional guideways," said the spokesperson.

The YASDA YBM 7Ti features a di-



rect-drive spindle system that is designed to keep cutting forces away from the spindle motor, which maintains consistency and repeatability. A YASDA self-adjusting spindle system automatically adjusts the preload to the spindle bearings, enabling a wider range of cutting capabilities.

YASDA HMCs have a large work envelope with X, Y, Z travels of 49.2" x 39.4" x 43.3" (1,250 mm x 1,000 mm x 1,100 mm) respectively, a vertical rotation of 360° and a horizontal rotation of

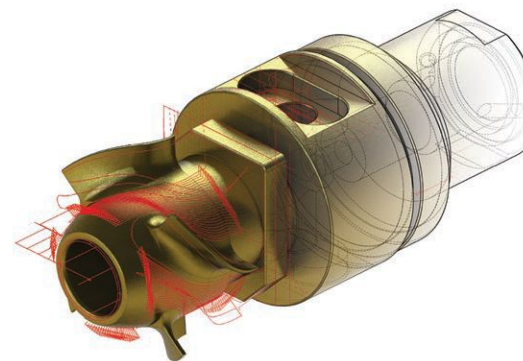
+/- 110°. A two-pallet system has 19.7" x 19.7" (500 mm x 500 mm) pallets for a maximum loading capacity of 1,102 lbs. (500 kg) on each pallet. Maximum part size is 24.8" (630 mm) in diameter and 19.7" (500 mm) in height. A YASDA curvic coupling system with large diameter circle gears is used to support the back side of the pallet, allowing the accuracy of the center of the pallet to be fully maintained. An automatic tool changer holds up to 450 tools. The powerful, new easy-to-use FANUC FS31i-B5 control is furnished standard.

For more information contact:
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Product Manager—Yasda
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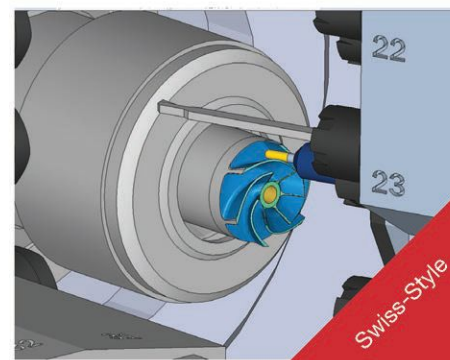
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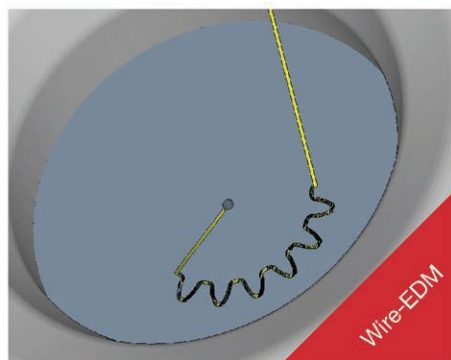
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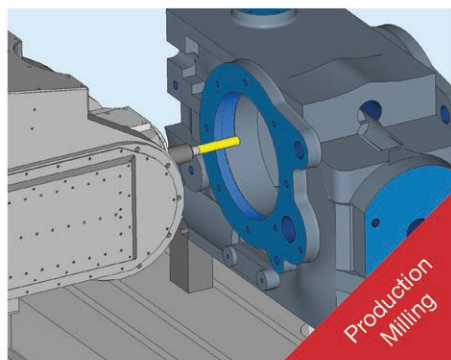
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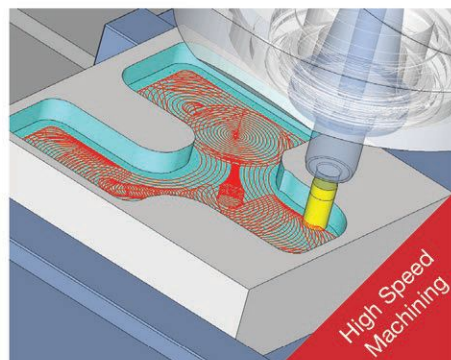
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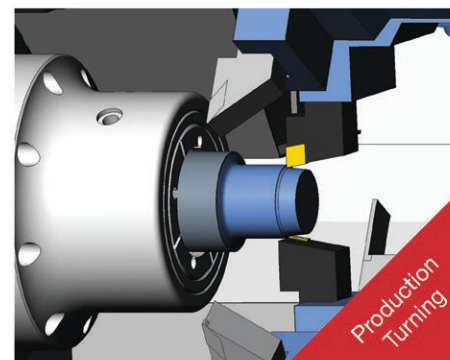
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Production Milling



High Speed Machining



Production Turning

5-Axis Gantry Mill for Large Components

Many industries today, such as aerospace and automotive design, are turning to 5-axis machining to speed manufacturing processes and increase accuracy. The ability to machine complex shapes, undercuts and difficult angles in a single set-up reduces tooling costs and labor time, resulting in a better cost per part.

The Haas GM-2-5AX is a 5-axis gantry

High-productivity options include the Haas Wireless Intuitive Probing System, a complete coolant system, dual chip augers and more.

For shops not requiring the flexibility of a dual-axis spindle head, Haas offers a 3-axis version of the GM-2. The 3-axis GM-2 provides the same X and Y axis travels as the 5AX, but with 22" (559 mm) of Z-axis travel, providing more rigidity for heavy machining. The GM-2 features a robust



mill designed for complex, large-part machining, such as airframe components, layup molds and composite structures. The machine's dual-axis spindle head provides $\pm 245^\circ$ of C-axis rotation and $\pm 120^\circ$ of B-axis tilt for complex surfacing, or to access nearly any angle on a part. Travels are 145" x 87.5" x 39.4" (3,683 mm x 2,223 mm x 1,000 mm), with 75" (1,905 mm) between columns, and the machine comes standard with a 144" x 72" (3,658 mm x 1,829 mm) aluminum table. The GM-2-5AX's 20,000 RPM HSK 63F spindle features a 13.4 HP (10 kW) integral spindle/motor drive and a 30+1 tool side-mount tool changer is standard.

To simplify 5-axis set-ups, the GM-2-5AX comes equipped with Haas Automation's Dynamic Work Offsets and Tool Center Point Control software.

40-taper in-line direct-drive spindle that spins to 8,100 RPM, and is powered by a 30 HP (22.4 kW) vector drive system. Optional 10,000 RPM and 15,000 RPM spindles are available for higher surface feeds and small tools. A 30+1 side-mount tool changer also is standard.

The GM-2 is available with a wide selection of options to boost productivity even further, such as high-pressure through-spindle coolant, dual-chip augers, the Haas Wireless Intuitive Probing System, a programmable coolant nozzle and more.

The GM-2 and GM-2-5AX feature the Haas Next Generation Control, designed to be faster, smarter and better than ever. They are Industry 4.0-ready, with built-in Ethernet connectivity, available WiFi and standard HaasCon-

nect mobile machine monitoring.

For more information contact:

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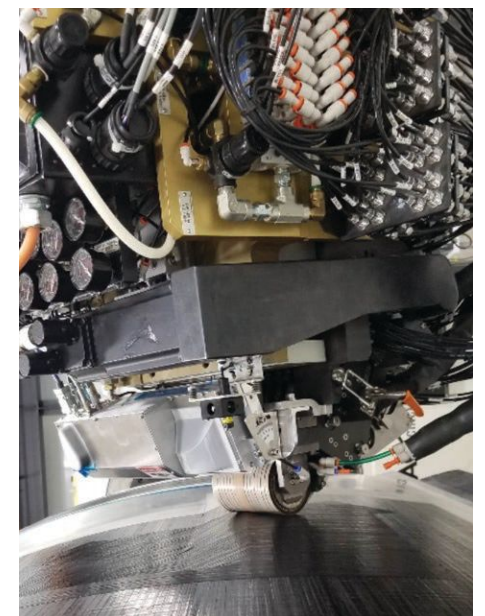
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Inspection Technology for the Aerospace Sector

As the aerospace industry in Canada and around the world continues to increase its use of automated composite manufacturing techniques to produce large aircraft components, the industry is eager to find solutions to manufacture reliable, safe and cost-effective composite structures. The National Research Council of Canada (NRC) and Fives are working together to improve the efficiency of manufacturing composite parts. They are developing an advanced profilometer that will provide faster and more accurate part inspection.

"Based on an innovative optical technology, the advanced profilometer for composite placement shows considerable advantages over existing inspection technologies used for the same purposes," said a company spokesperson. "This groundbreaking in-process inspection technology will help manufacturers meet strict



This Fives Viper Automated Fiber Placement machine, integrated with NRC profiling technology, enables high-quality, real-time in-process inspection for the aerospace industry.

standards by providing enhanced measuring information without limiting the process functionality. These faster, better measurements will speed up manufacturing processes, reduce the risk of errors and help composite manufacturers be more competitive."

Fives has already started the last testing stage of the next-generation profilometer with customers and expects to begin commercializing the technology before the end of 2019. The NRC and Fives will continue to work together to advance this technology.

For more information contact:
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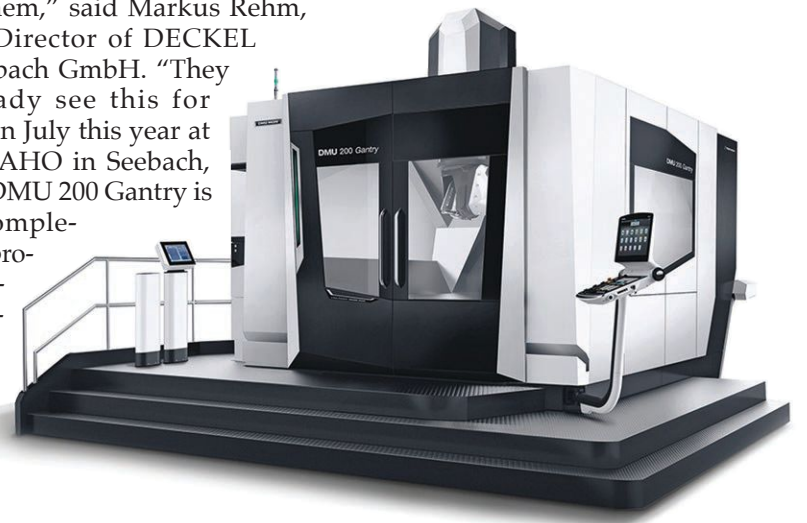
5-Axis Machining with Up to 30,000 RPM and Optional Technology Integration

The DMU 200 Gantry from DMG MORI combines the machining of large components and maximum dynamics. It is suitable for users in the aerospace and automotive industry as well as in model making and the energy sector.

With the 5-axis machining of up to 30,000 RPM and optional ULTRASONIC or LASERTEC technology integration, more complex components weighing up to 22,046 lbs. made of aluminum or composites as well as welded components can be machined econom-

ically. The machine can be easily loaded from the top with a crane. The low gantry design of the DMU 200 Gantry enables optimum utilization of the work area. With a footprint of no more than 169.3" x 212.6", the machine achieves travel paths of 78.7" x 78.7" x 47.2", with which DMG MORI is complementing its product range between the DMF and the DMU P series. "The ratio of the large work area of 6.6 in. x 6.6 in. to less than 258.3 sq. ft. footprint has also inspired our customers – even

surprised them," said Markus Rehm, Managing Director of DECKEL MAHO Seebach GmbH. "They could already see this for themselves in July this year at DECKEL MAHO in Seebach, Rehm. The DMU 200 Gantry is the ideal complement of the product portfolio for the machining of large components at the Seebach location."



With a footprint of less than 258.3 sq. ft., large components of up to 78.7 x 78.7 x 47.2 in. and 22,046 lbs. can be machined.

The combination of cast iron machine bed and gantry portal creates a solid basis for the high dynamics. With rapid traverses of up to 1,968.5 IPM and 0.5 g acceleration, large components can be machined efficiently. Depending on the field of application, two milling heads are available for 5-axis simultaneous machining, a 45° as well as a 90° milling head. The first one enables the best possible utilization of the work area, while the 90° milling head enables the use of application-specific spindles, including the compactMASTER with a rotational speed of 20,000 RPM as standard in the 5-axis version. Additional spindle options comprise rotational speeds of 24,000 RPM, 28,000 RPM and 30,000 RPM. The vertical 3-axis version of the DMU 200 Gantry is equipped with a speedMASTER spindle with 20,000 RPM. Adding to this is the optional ULTRASONIC milling head as well as the LASERTEC Shape Technology. This technology can be used to completely machine molded parts including surface structuring.

For the machining of composites or modelling material like Ureol, an efficient tripartite dust extraction is optionally available. This consists of an extraction system on spindle nose, extraction system in the table area and a work area extraction system with continuous volumetric flow. The basic construction of the machine was already designed with this in mind.

The DMG MORI toolSTAR tool magazine has 30 pockets as standard. Optionally, up to 120 tool stations are possible. Good accessibility of the tool magazine from the front with separate operating panel is part of the ergonomically machine design. The DMU 200 Gantry is accessible from two sides. The DMG MORI ERGOline Terminal with 21.5" multi-touch screen and CELOS can be easily swiveled to both sides.

Selected DMG MORI technology cycles are available in parallel. Examples are 3-D quickSET for high kinematic precision and ATC for top surface quality.

If required, the machine can be supplied with a through-loading option. In this case, the control cabinet is positioned next to the machine, which enables improved accessibility of the work area from the front and the rear.

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Related to this is the possibility of automation. A high process reliability is provided by the excellent chip management. The chips get to the funnel-shaped machine bed on both sides of the table, from where they drop into the chip conveyors and are disposed of towards the rear.

With regard to the target markets, Rehm said, "The modular concept with through-loading option and two milling heads for 5-axis simultaneous machining as well as the high dynamics of up to 0.5 g predestine the machine for model making as well as the machining of structural parts or aluminum plate machining in the aerospace industry."

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Solid Carbide Thread Mills

Emuge Corp. has introduced advanced Threads-all ZGF-S-Cut solid carbide thread mills featuring multiple teeth, a helical flute form and multi-layer TiAlN T46 coating. "The new ZGF-S-Cut thread mills are designed to increase tool life over 10 times more than conventional tools and produce precise threads in exotic materials including Inconels, nickel based superalloys, monel, titanium, 420 stainless steel and more," said an Emuge spokesperson.

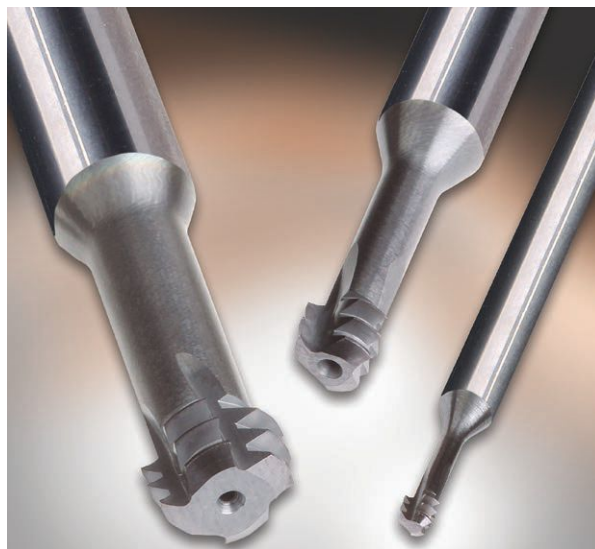
"To efficiently thread challenging, expensive materials we are pleased to offer our new ZGF-S-Cut thread mills," said Marlon Blandon, Thread Milling Product Manager, Emuge Corp. "The new thread mills are an ideal solution when threading Inconel and other high temperature alloys because the heat is carried away during chip evacuation and does not stay with the part. The new tools are excellent for producing finer threads in aerospace applications such as engines, connecting rods and landing gear, as well as in other components comprised of exotic materials."

For increased tool life and productivity, the thread mills have multiple teeth, the first acting as a rougher and the next two teeth performing finishing. By dividing functions into three cutting edges, speeds and feeds can be increased, and threads can be produced in a single pass. A 10° left-hand helical flute form and chamfer geometry combine to optimize chip evacuation in the forward direction and add strength to the cutting teeth for enhanced tool life and process security. For increased tool strength, ZGF-S-Cut thread mills have multiple flutes.

The tools are available in 2xD lengths, have coolant-fed options starting at .25" diameter, and one tool easily makes STI threads for both through and blind holes. ZGF-S-Cut thread mills are offered in inch sizes ranging from No.2 or M3 through 7/16 or M10.

The entire Emuge Threads-all ZGF

program of premium sub-micro grain carbide thread mills encompasses solutions for the production of internal threads from No. 0-80 (M1) to 3/4-16 for demanding industries using difficult materials such as stainless steel, titanium and Inconel. Coolant fed options are available starting at the 5/16" diameter size. "Available in 2xD and 3xD lengths in both miniature and standard thread sizes, the Threads-all family of thread mills provides high quality, dependable solutions for the



toughest applications with full bottoming threading within one pitch," said the spokesperson. Threads-all tools provide total control over pitch diameter limits including 2B, 3B, 3BG and all oversize variants. Single plane and multiple plane tools are offered.

For more information contact:

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Compact Airfoil Manufacturing System

GF Machining Solutions offers its Liechti go-Mill 350, the 5-axis machining center specially designed for machining blisks, impellers, turbine blades and other complex parts.

The Liechti go-Mill 350's compact 20.9' x 14.1' (6.4 m x 4.3 m) footprint accommodates blades up to 13.8" (350 mm) in length. With a 20,000-RPM spindle and either a tailstock or double-end rotary configuration, it is designed to deliver the power and precision required to produce an enhanced surface quality for challenging airfoil machining applications, such as finishing the critical zones of leading and trailing edges. The machine also features 30 or 60 tool positions and a 16-position part changer.

Liechti produces milling machines designed to reduce machining times more than 30% as a result of specific profile machining technology and specialized CAD/CAM software. "This high level of performance is based on engineering competence and know-how for full 5-axis and ultra-dynamic machining in titanium, Inconel, Nimonic, titanium aluminide and high-alloy steels," said a company spokesperson.

For more information contact:
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Fit 5-Axis Machining into Any Shop

Mazak Corporation offers its 5-axis VC-300A/5X vertical machining center (VMC). "Suitable for the aerospace and medical industries as well as job shops, the VC-300A/5X brings advanced technology and production value to high-precision small parts processing in a space-saving package designed to fit into any manufacturing environment," said a company spokesperson.

The VC-300A/5X comes standard equipped with a robust, high-performance CAT-40, 10,000 RPM spindle designed to deliver enhanced metal removal capabilities in all common materials, including steel, aluminum and cast iron. A 12,000 RPM spindle is additionally available to address an even greater range of part-production requirements. An optional 47 HP (35 kW), 20,000 RPM integral spindle is also available for increased metal removal.

Axis travels for the VC-300A/5X measure 11.81" (300 mm) in X, 11.81" (300 mm) in Y and 20.078" (510 mm) in Z, all with rapid traverse speeds of 945 IPM (24 m/min). The machine can accommodate workpieces up to 3.9" (100 mm) in diameter, 6.1" (155 mm) in height and 341.7 lbs. in weight. The machine comes standard with an 18-tool drum-style magazine or optional 24-tool magazine for redundant tooling to allow for unmanned, uninterrupted operations. Its automatic tool changer (ATC) provides fast tool exchanges for an overall reduction in non-cut times.

To minimize thermal displacement,



Mazak incorporates an oil chiller that cools the VC-300A/5X's headstock and spindle. The machine's trunnion-style rotary/tilt table is constructed with durable high-speed roller gear cam drive technology for high torsional rigidity and positioning accuracy. The table tilts from +20° to -120° in the B-axis and rotates 360° in the C-axis.

Mazak's MAZATROL SmoothX CNC on the VC-300A/5X is designed to easily generate programs for highly complex parts production. It has several

advanced functions that allow the shortest possible machining cycle times, especially in fine increment programs for simultaneous 5-axis operations and free-form die-mold machining. These functions include High-Gain Feed Forward Control, Fast Rotary Axis Speeds, VARIABLE ACCELERATION CONTROL and INTELLIGENT POCKET MILLING.

Ergonomics also play an important role in the functionality of the MAZATROL SmoothX CNC. A large 19" display presents all of the critical machine data within a single page view, while the tilt control panel allows for optimum positioning based on operator height. An intuitive multi-touchscreen, which is similar to that of a smartphone, enables fast and smooth programming operations. An SD card allows the CNC to store up to 32 GB of data.

For more information contact:

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www.mazakusa.com

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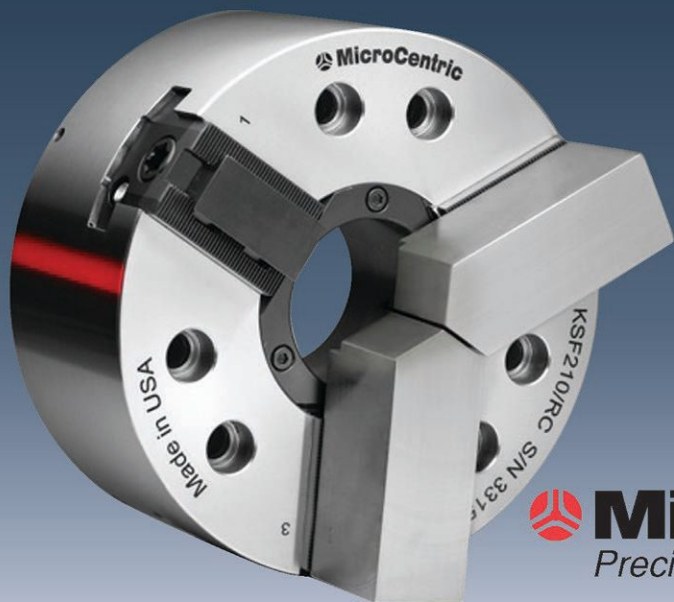
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Aviation Clamping System for Handling Large Parts

The SCHUNK Vero-S Aviation product line is designed to rigidly clamp large parts accurately, and through its unique design enable the user to release the part enough to allow the part to move (compensate) due to the stresses of machining without fully releasing the part. Therefore, the clamp - unclamp and reclamping of the stress relieved part can be done in under a minute without losing the established primary reference datums. This is accomplished through the use of four uniquely designed modules.

The first module is fixed in all axes to establish the primary reference point. The second module allows the workpiece to compensate in one axis (X-axis). The third module allow the workpiece to compensate in two axes (X and Y). The fourth module allows compensation in all axes including height and angularity.

For more information contact:



SCHUNK Inc.
211 Kitty Hawk Drive
Morrisville, NC 27560
919-572-2705
info@us.schunk.com
www.us.schunk.com

Tilt-Spindle 5-Axis Horizontal Machining Center

Mitsui Seiki's new HU100-TS 100 tilt-spindle 5-axis horizontal machining center (HMC) is built to handle machining of large, hard-metal workpieces that are better suited for tilt-spindle processing than



HU100-TS
tilt-spindle
5-axis
horizontal
machining
center

trunnion table operations. The machine's fixed table and tilting head arrangement facilitates production of heavier and larger parts and can permit use of shorter, more rigid tooling. The new machine offers high rigidity and accuracy when machining tough materials such as titanium and Inconel that are common in aerospace, power generation and other high-value applications.

The horizontal table of the HU-100TS can accommodate workpieces up to 1,900 mm (76") long and 1,250 mm (50") in diameter, weighing up to 4,400 lbs.

X-, Y- and Z-axis travels are 1,300 mm (52"), 1,500 mm (60") and 1,400 mm (56") respectively, with B-axis rotation of 360° and A-axis rotation of -30° to +120°. The machine's compact 5,530 mm (221") x 8,431 mm (337") footprint is similar to that of its 4-axis equivalent.

The column width and length/height ratio of the HU100-TS are engineered to maximize stability in heavy machining. The machine's HSK-A100 taper spindle provides up to 150 kW (201 HP) power and 1,508 Nm (1,112 ft-lbs.) torque. A standard automatic tool changer has capacity for 60 tools (180

optional), up to 500 mm (20") in length. Maximum tool diameter is 125 mm (5"); tools stored without adjacent tools can be up to 216 mm (8.6") in diameter.

"For aerospace manufacturers and others machining tough alloys, the new HU100-TS offers 5-axis, tilt-spindle flexibility and the automation potential of a HMC as well as the rigidity, accuracy

and reliability of a heavy-duty design," said a company spokesperson.

For more information contact:
Mitsui Seiki USA Inc.
563 Commerce Street
Franklin Lakes, NJ 07417
201-337-1300
info@mitsuiseiki.com
www.mitsuiseiki.com

New 5-Axis Aerospace Gantry Machine

"APEC (Asia Pacific Elite Corp), known for large linear-drive gantry machining centers, debuts its new 2-axis high speed, high power, HSK-63A spindle head for the GM Series," said a J2 spokesperson.

"The latest cutting tool technologies and machining strategies are a great way to increase productivity within the aerospace industry, but require a machine specifically suited to the task," continued the spokesperson. "This new spindle is equipped with 167 HP and 30,000 RPM, ensuring the G and GM Se-

ries provides one of the highest non-ferrous material removal rates in the market. It also features innovative direct drive motors, enabling highly dynamic 5-axis contouring capabilities. With this spindle, APEC's 5-axis feedrates rival those of 3-axis machining centers."

The G and GM Series have a high rigidity structure design, featuring a symmetrical "box-in-box" structure of cross-beam and saddle. Box-in-box structure distributes force equally to improve deformation and to perform at high accuracy while high-speed

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machining. "APEC's force flow design decreases thermal deformation and weight of moving parts, while dual drives ensure smooth cutting and the best part quality available," added the spokesperson.

APEC's linear drive design is suitable for aerospace manufacturing because it allows for large parts production 1.5-2 times quicker than the standard ball screw bridge mill design. The X, Y and Z axes feature linear motors, linear scales and rigid linear guideways. Linear motor drives work alongside the spindle to improve production capabilities by eliminating backlash, transmission loss and wear. G and GM Series rapid traverse is up to 60 m/min and has acceleration of 5 m/sec for increased overall production. Machines are available from

12' up to 98' in length.

APEC is a subsidiary of the Tongtai Group specializing in the design, manufacturing and sale of large gantry high-speed 5-axis machine tools. These machines can be applied to industries from aerospace, transportation and solar energy.

For more information contact:
J2 Machine Tool Group
814-807-2113
info@j2machinegroup.com
www.j2machinegroup.com

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www.mfgnewsweb.com

AM Capabilities for Spinal Implants

Renishaw, a precision engineering and manufacturing technologies company, has collaborated with two advanced technology firms to demonstrate the advantages of additive manufacturing (AM) in the production of spinal implants. By working with Irish Manufacturing Research (IMR) and nTopology, the project shows how streamlined the transition from design to AM can be when working with the right partners.

IMR designed a sample titanium spinal implant, aimed at the cervical spine (c spine), using nTopology's generative design software. IMR then manufactured the implants using Renishaw's RenAM 500M metal AM system.

"AM can be used to manufacture spinal implants with lattice structures, which cannot be achieved with conventional manufacturing techniques," explained Ed Littlewood, Marketing Manager of Renishaw's Medical and Dental Products Division. "An implant with a lattice structure is lightweight, can be optimized to meet the required loading conditions and has a greater surface area, which can aid osseointegration. AM implants can be designed to mimic the mechanical properties of bone, resulting in better patient outcomes. But all of this comes to nothing if you do not have the tools to create the design."

"Traditional CAD tools were not built to design complex lattice structures; the job would be difficult or even

impossible," said Matt Rohr, nTopology's Application Engineering Manager. "nTopology's software was designed to complement existing workflows and make the job easier. We cut the design time of complex structures from days to minutes, which was a crucial component in helping this project run on schedule."



"Renishaw worked tirelessly with us on improving the AM process for producing the spinal implants," commented Sean McConnell, Senior Research Engineer at IMR. "Together, we designed a set of experiments that yield the most appropriate parameter settings for the product. As a result, we reduced the amount of post processing required on key features of the implants

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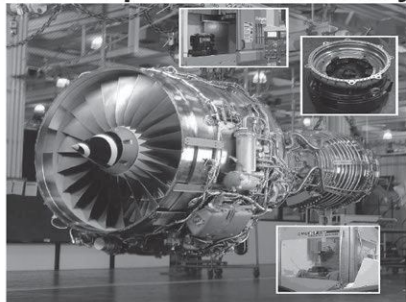
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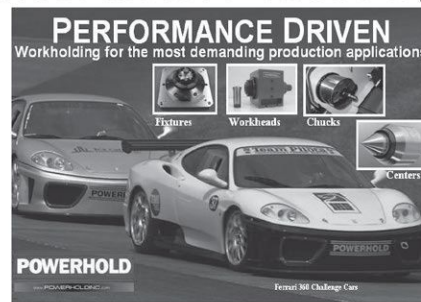
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Renishaw also uses its AM machines to produce healthcare products, such as craniomaxillofacial implants and dental frameworks.

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medical-and-healthcare

HEIDENHAIN to Share Expertise at Amerimold 2019

HEIDENHAIN CORPORATION is taking part in the upcoming Amerimold 2019 trade show in Rosemont, IL, from June 12-13. HEIDENHAIN will participate in a panel of presenters ready to discuss significant moldmaking industry topics.

As part of those Amerimold presentations on June 12 at 1 PM in the Tech Talk Theater, industry veteran Gisbert Ledvon, HEIDENHAIN's TNC Business Development Manager, will discuss "What You Should Know about the Last 20 Years of Innovation". Ledvon will share his experience and insights in the mold industry, including topics ranging from EDM to 5-axis machining and laser texturing technology, including automation of such.



Also, multiple precision measurement/motion control components, for example, the HEIDENHAIN's TNC 640 high performance mill-turn control, will be on display.

The TNC 640 is particularly well suited for milling-turning, HSC and 5-axis machining on machines with up to 18 axes. It utilizes a groundbreaking touchscreen technology that supplements the TNC 640's field-proven cy-

cles and functions. This control also allows the user to operate the screen with gestures, similar to smartphones or tablets.

Features of particular interest to mold makers include the TNC 640's Dynamic Precision options which improve mold surface quality and precision specifically on 3-D. Also, of importance is its Dynamic Efficiency features which allow the machining center to automatically optimize speeds, and feeds cutting speeds in variable workpiece thicknesses.

An application story regarding HEIDENHAIN TNC at mold maker Kronos is available on HEIDENHAIN's U.S. website.

For more

information contact:

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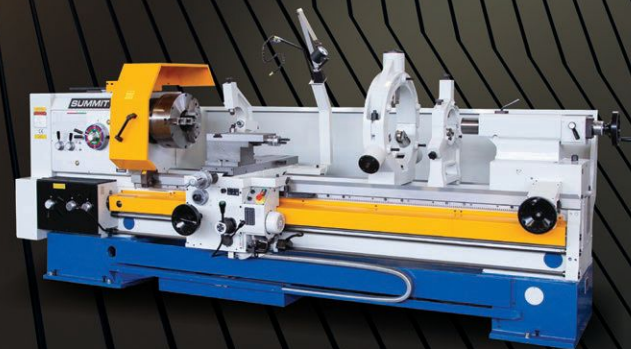
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show June 12-13 at the Donald E. Stephens Convention Center in Rosemont, IL.

The company will have technical experts on hand to discuss, in particular, UNISIG's all-encompassing USC-M range of solutions that allow today's moldmakers to match system capabilities to their specific part and production needs.

Within UNISIG's full USC-M range of drilling and machining centers for moldmakers are universal spindle-style machines, dedicated spindle types and high-dynamic machining centers. For both gundrilling and machining, USC-M universal spindle machines offer versatility and fast changeovers between the two processes for the efficient production of complex mold components.

Equipped with both milling and drilling spindles, the dedicated spindle type USC-M machines provide gundrilling, BTA drilling and machining. This selection of 5-axis to 7-axis machines allows moldmakers to not only acquire the exact machine capabilities for their production requirements but also gain a system that improves overall part machining performance.

For robust mold component processing, the UNISIG USC-M high-dynamic machining centers provide powerful geared-headstock milling, dynamic machine motion performance and both BTA and deep hole drilling all on the same machine platform. The heavy-duty machines in this range feature seven axes, tool changer capacities of 90 to 120 tools and automatic pallets chang-

ers that handle loads up to 25 tons.

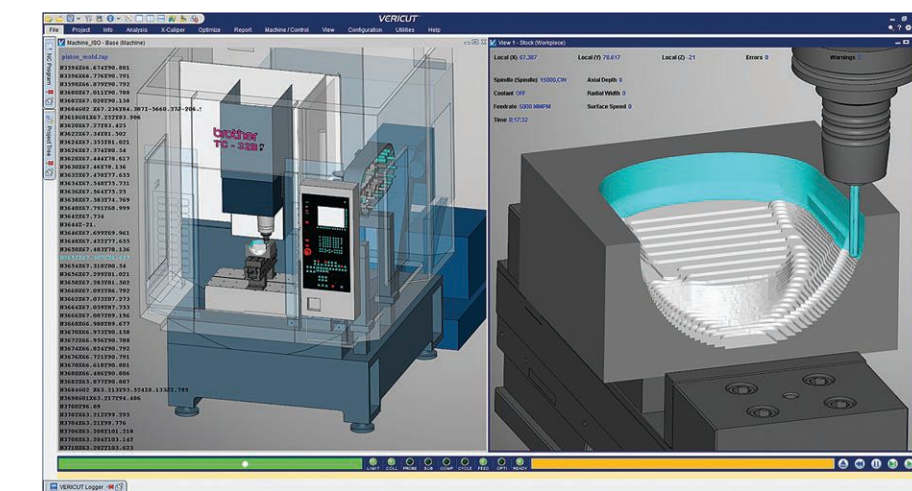
According to Anthony Fettig, CEO of UNISIG Deep Drilling Systems, the company engineers and manufactures its USC-M machines to improve overall part processing for a complete range of mold component applications. "We are committed to providing solutions that are aligned with the needs and goals of moldmakers," he said. "Backed by a high-level knowledge and service, our machines deliver process stability and reliability to keep today's moldmakers productive and competitive."

For more information contact:
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262-252-3802
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www.unisig.com
Amerimold 2019 Booth 1108

CGTech to Demonstrate New Feature of VERICUT 9.0 at Amerimold

CGTech will host demos of VERICUT's Force Optimization, Additive module and new graphics and features coming soon in version 9.0, at Amerimold on June 12-13.

VERICUT's Force optimization is engineered to reduce machining times by as much as 30-70%, even for super-alloy metals and makes cutters last



longer. The Additive module simulates both additive and traditional machining (milling or turning) capabilities of new hybrid CNC machines.

"CGTech is committed to helping customers improve their competitive stance through NC toolpath and process optimization. CGTech consistently works to improve simulation performance, and to provide powerful and easy-to-use features that streamline each user's verification process," said VERICUT Product Manager, Gene Granata.

New features included in VERICUT version 9.0 include:

- New enhanced graphics – sharper views of the cutting process, enhanced performance and flexibility to rotate or zoom while cutting
- Improved efficiency – flexibility to use major functions (like X-Caliper and AUTO-DIFF) in any view and fluent

switching between Workpiece and Machine views, layouts and docking arrangements

- Added power and convenience – more and easier ways to section the part, streamlined set-up for toolpath optimization and significant enhancements for lathe and mill-turn tooling.

For more information contact:
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9000 Research Drive
Irvine, CA 92618
949-753-1050
info@cgtech.com
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C.R. Onsrud Tech Expo



C.R. Onsrud recently held a Tech Expo at its headquarters in North Carolina.

The Tech Expo brought together dealers and prospective customers from across the country to tour the facilities, watch live machine demos and gain access to exclusive machine deals.

C.R. Onsrud's technology is used in a variety of industries, including woodworking, plastics, aerospace and

automotive.

To see a video of the event, go to www.youtube.com/watch?v=2t1wWTe-Vg0

For more information contact:

C.R. Onsrud
P.O. BOX 149/ 120 Technology Dr.
Troutman, NC 28166
800-638-8185
704-508-7000
info@cronsrud.com
www.cronsrud.com

Product Updates to DataXchange Machine Monitoring



Shop Floor Automations has announced new features from Scytec DataXchange machine monitoring. The recent Version 2019.01.15 update has new features.

Features with this Cloud-based or on-premise OEE software include:

- Track scheduled downtime - You are now able to plan for specific downtime in your shop. You can schedule holidays, plant shutdowns, planned maintenance and more. These planned downtimes will automatically be recorded and reported on.
- Integrating work orders with your machine monitoring - DataXchange now has an easy-to-use import feature. You can import your current part, ideal times and work orders by using our import template. Once that information is in the system, you can see real-

time data regarding your work orders, as well as historical information.

- Hardware can be added to legacy equipment to monitor electrical signals. These signals alert you if the machine is running or not running. You are not limited to monitoring newer equipment - collect data from every machine age, make and model on your shop floor.
- Modifications have been made with FOCAS connectivity, charts and reports, RTV screens, user events and more.

For more information contact:

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Shop Floor Automations, Inc.
5360 Jackson Drive, Suite #202
La Mesa, CA 91942
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info@shopfloorautomations.com
www.shopfloorautomations.com

JRI/Jenfab Announces Rebrand, Consolidation

JRI/Jenfab, a nationwide manufacturer of aqueous washing machines for industrial components (parts washers), has announced that it is consolidating its operations and rebranding itself under the name of Jenfab Cleaning Solutions.

The first step in this process will be the launch of a new corporate identity. This will include a new logo, website and social media presence that represents the unity and new direction of Jenfab Cleaning Solutions.

In addition, the company will consolidate its operations by relocating the Berlin, CT, manufacturing facility to its new, 60,000 sq. ft. headquarters in Springfield, MO. This will provide the long needed extra space required for current operations as well as space for future growth.

"This is a turning point for our company," said President and CEO Rhonda Wright. "By unifying both brands under one name and consolidating our operations, we are positioning ourselves for

continued growth within the market. I have every confidence this will result in a better and stronger company for both our customers and employees."

The decision to restructure comes six years after JRI Industries acquired Jenfab and the two companies were brought together under one ownership umbrella. By further consolidating its operations, Jenfab can maximize its manufacturing efficiency as well as improve the service and quality of its products. In addition, the use of one brand name will help eliminate any market confusion that may have existed in the past and serve to further unify the company and its offerings.

Jenfab will continue to offer its full suite of solutions for any industrial parts cleaning need.

For more information contact:

Jenfab Cleaning Solutions
1435 N. Alliance Ave.
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www.jenfab.com

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Lathe Control Offers New Functionality



HEIDENHAIN's lathe control, the CNC PILOT 640, is offered with newer upgrades. Most notably, a new TURN PLUS feature is now standard on new purchases that allows the creation of a lathe program by the push of a button with up to 90% time savings.

The new versions of the control software also include other improvements such as added Functional Safety (FS) features and expansions that provide the machine operator and the machine tool builder with more benefits.

"The CNC PILOT 640 contouring control is suitable for lathe applications of complex parts because it combines simple operation with reliable, high quality series production," said a company spokesperson. It allows 5-axis simultaneous machining and combined turn-mill operation, full surface machining with B-axis and counter spindle, as well as up to three channels for asynchronous multi-side machining.

Continued on Page 34

3D Import with 3D DXF Technology



The Hurco MAX5 control is now even more powerful with the new 3D Import feature that includes 3D DXF technology. This control feature allows the user to simply load the file they receive from their customer directly into the Hurco control. "3D Import eliminates extra steps and is a huge time saver," said Mike Cope, Product Technical Specialist for Hurco.

Cope explained the evolution of the 3D Import, which illustrates Hurco's commitment to continuous innovation of conversational programming, which was invented by Hurco in 1976. "When Hurco introduced the DXF Transfer option in 1992, it was a real game changer for the end user because many shops received DWG or DXF drawing files. This made it

very easy to transfer the files to the machine and use them to create their programs on the shop floor (right at their Hurco CNC machine), and also eliminated incorrect data being entered, or 'fat-fingering numbers' as we say in the shop. Today, it is common for shops to receive solid models of the parts that they need to produce, and even paper prints are becoming obsolete. Therefore, Hurco engineers developed 3D Import, which includes 3D DXF technology that displays all geometry that the CAD system outputs, including splines. With 3D DXF, the

The integrated Hurco control powered by WinMax is flexible and intuitive. Hurco's new 3D Import feature includes 3D DXF technology that now displays all CAD geometry, including splines and Z-depths.

Continued on Page 34

Direct Robot Control Function



Mitsubishi Electric Automation has introduced a new standard feature for its M8 series CNC controls: Direct Robot Control. This latest feature adds to the lineup of standard features on its M8 line of CNC controls.

The Robot Direct Control function is designed to allow easy control of a robot through a Mitsubishi M8 Series CNC Controller. Easily connected by an Ethernet cable, with a robot-dedicated HMI screen, Mitsubishi has eliminated

the need for daily use of the Robot Pendant Screen, making it easier for the end-user. The CNC will be able to control the programming, and other functions or movement of the Robot (such as deburring, inspection, etc.), during the CNCs regular machining process.

Data provided on these screens include:

- Status of the robot
- Automatic operation of the robot via

Continued on Page 34

For more information on Controls/Digital Readouts/Encoders Visit www.mfgnewsweb.com

Touch Panels with Sidescreen Enhancement

Siemens offers its Sinumerik CNC Blackline touch panels with a new feature, the sidescreen enhancement. This development enables users to customize the panel of the CNC, laying out the operator panel in real time, using a drag-and-drop technology. Screens can be customized to view documents, camera projections, web server access information, access protection data for IT security protocols and even user administration.

Features and functionality such as the ongoing

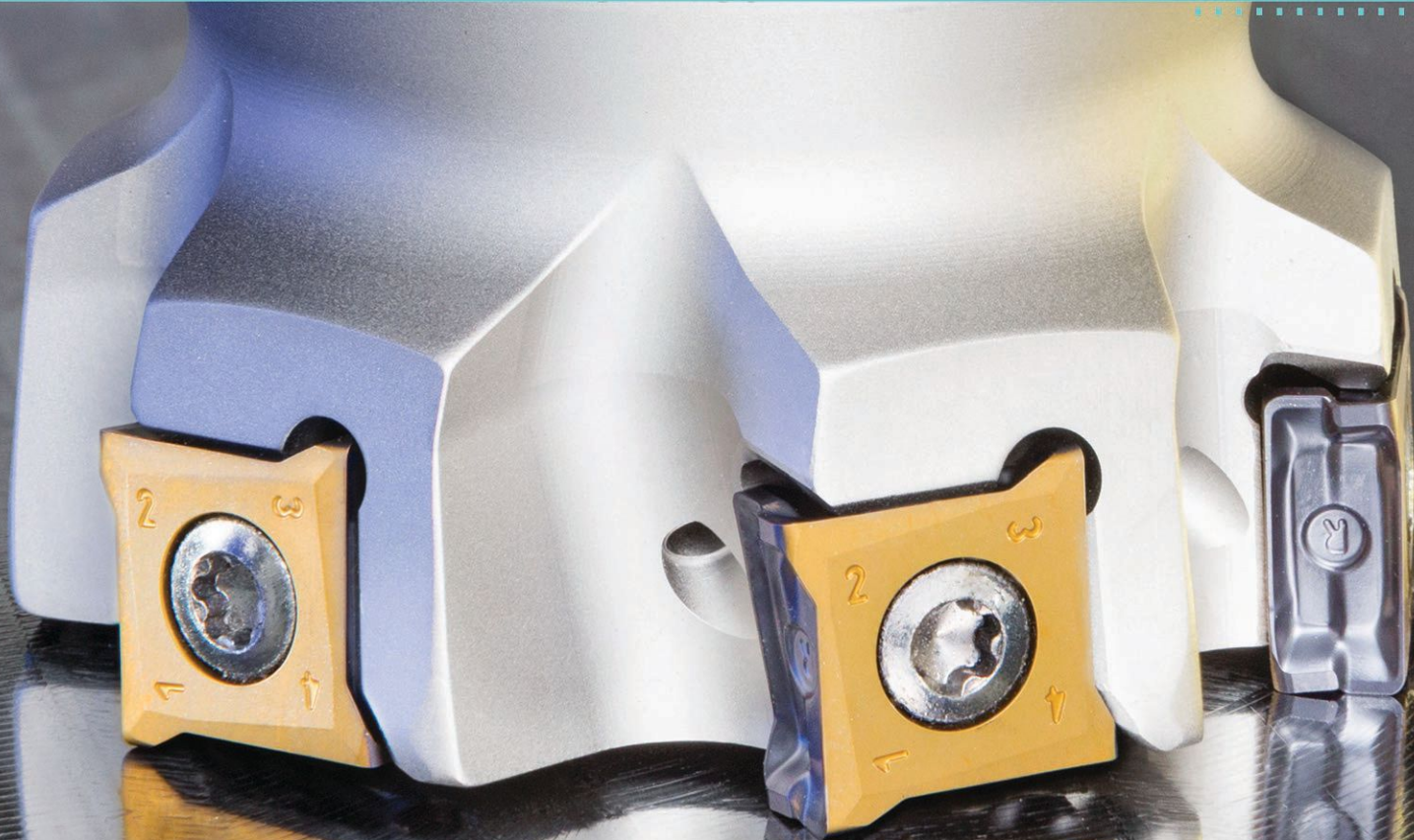
Machine tool users with Sinumerik controls onboard can now benefit from high-definition, multi-touch screens with an additional customizable display area for even more functionality. The operator panel can easily be customized via drag-and-drop.



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Direct Robot Control

Continued from Page 32

robot-dedicated G-code commands, inside the CNC memory

- Manual operation of the robot via the CNC Hand Wheel as well as dedicated on screen jog buttons
- Buttons to accommodate the motion of end of arm tooling (example: Open and Close gripper).

G-Codes will be available for commands such as Robot ON/OFF, linear interpolation, circular interpolation, absolute and incremental dimensioning and Robot coordinate system setting. The robot velocity or acceleration can be set through programming with a simple percentage setting (1-100%). Robot Joint Interpolat-

ion commands can be used, enabling the robot to determine the fastest motion from Point A to point B. Conversely, Robot Linear Interpolation can also be used in which the robot will choose a straight-line path from Point A to Point B. The added benefit to incorporating G-Code programming into the CNC is that end users familiar with it can easily apply their previous knowledge of G-Code programs. The CNC is able to integrate with different robot manufacturers.

For more information contact:
Mitsubishi Electric Automation Inc.
500 Corporate Woods Pkwy.
Vernon Hills, IL 60061
847-478-2500
us.mitsubishielectric.com/fa/en

Touch Panels with Sidescreen Enhancement

Continued from Page 32

checking of the machine tool status, quicker and easier navigation, elimination of mechanical keys and adding new keyboards can be achieved with the sidescreen feature. "The result is greater space savings with improved and highly flexible design and feature arrangement onscreen," said a company spokesperson.

Sinumerik CNC sidescreen can be opened or closed on either the left or right side of the master operator panel and allows for positioning to suit the design and viewing angles on the machine for greater operator ease of use. The sidescreen works with the Sinumerik Operate graphical user interface.

These Blackline Plus sidescreen op-

erator panels are available in 16:9 aspect ratio, high-definition formats with multi-touch, scratch-resistant and non-reflecting panel technology, sealed for use in harsh manufacturing environments yet sensitive enough to permit simple and secure operation while wearing gloves.

This feature is now offered on Sinumerik 840D sl models with 15", 19", 22" and 24" operator panels.

For more information contact:
John Meyer
Siemens Industry, Inc.
390 Kent Avenue
Elk Grove Village, IL 60007
847-640-1595
cnc.marketing.us@siemens.com
www.usa.siemens.com/cnc

Lathe Control Offers

Continued from Page 32

Multitouch operation allows swiping and zooming in and out, and high resolution 3-D simulation graphics have been added. Machining operations with one or several set-ups (multi-channel operation) can be programmed separately through structured programming. The maximum number of controlled axes and spindles has been increased to 24 using appropriate options.

The CNC PILOT 640 lathe control is available with two screen formats: 19" and 15.6" with up to 25 configurable fields. It also now works with HEIDEN-

HAIN's display handwheels HR 520 (FS) and the HR 550 FS radio handwheel system. New CFRCompactFlash memory cards and SIKs are also available.

For those interested in connected machining, the CNC PILOT 640 can be incorporated into such systems by utilizing HEIDENHAIN options Remote Desktop Manager (option 133) and State-Monitor for capturing machining data.

For more information contact:
HEIDENHAIN Corporation
333 E. State Parkway
Schaumburg, IL 60173-5337
847-490-1191
www.heidenhain.us

3D Import with 3D DXF Technology

Continued from Page 32

customer can select the bottom of a contour, and the Z-axis depths will also be automatically input into the conversational block."

All previous versions of DXF translators only displayed lines and arcs data, and were only useful in 2-D since no Z-axis data was translated. 3D Import (the solid model portion) automatically creates the necessary Transform Plane data blocks in conversational programming for 5-sided programs. "As a proponent of 5-sided machining, the automatic creation of Transform Planes is where this control feature really shines," said Cope, who is the author of the book, *The Power of FIVE: The Definitive Guide to 5-Axis Machining*.

"Additionally, the integrated Hurco control powered by WinMax is the most flexible and intuitive control in the industry in addition to being equipped with more memory and processing power out of the box: 2.7GHz dual core processor, 4GB RAM memory, a 128GB solid state hard drive, 10,000 block lookahead and an intuitive graphical user interface that supports multiple machining strategies," said a company spokesperson.

"As the inventor of Conversational Programming, Hurco conversational programming is considered the gold standard in the industry, but the control has many high-end features for NC Programming, too. The Hurco control is considered the most flexible control in the industry. I think we might be the only company to have a feature called NC/Conversational Merge that provides users with a blend of both programming methods, which is very popular with machinists, especially those that do not initially think conversational programming will benefit them," said Cope.

"In addition to the integrated MAX5 control, Hurco's expansive line of CNC machining centers are equipped with the sophisticated motion control system Hurco invented that determines the optimal trajectory to run the tool, provides consistent programmed feedrates and reduces cycle time," said the spokesperson. "With this patented motion control system called UltiMotion, cornering velocity is 2.5 times faster than conventional motion, machine jerk is reduced by half; and because the software is smart enough to adapt as required by the tool path, dynamic variable lookahead can be up to 10,000 blocks. UltiMotion is different than the smoothing features offered

by CAD/CAM software and improves upon CAM output by providing better handling of the machine mechanics and dynamics." All Hurco CNC machining centers are equipped with UltiMotion as a standard feature. No set-up or programming is required.

For more information contact:
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P.O. Box 68180
Indianapolis, IN 46268
800-634-2416
info@hurco.com
www.hurco.com

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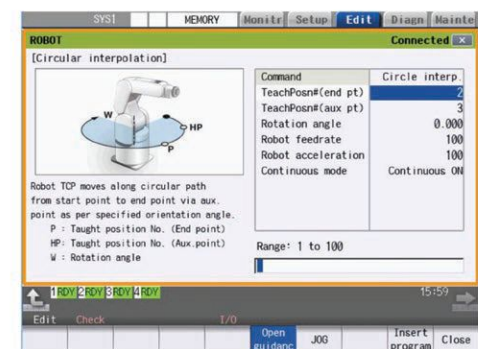


Introducing: Direct Robot Control Function

Mitsubishi Electric Automation is always striving to provide our customers with the best user experience when using our CNC controls. It is with this continuous effort that we have introduced a new standard feature for our M8 series CNC controls: Direct Robot Control.

Our new Robot Direct Control function allows effortless control of your robot through our M8 Series CNC, which eliminates the need for multiple controls, devices, screens, and operators making your machine a one stop shop for all of your automation needs.

For more information on how to implement the Direct Robot Control Function in your facility, please contact our Mechatronics department at 847-478-2500 or cnctraining@meau.com



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Easy Volumetric Compensation

Fagor Automation's Volumetric Compensation feature is designed to ensure accuracy by correcting typical geometric errors, making sure that more products end up in the hands of the customer and not the scrap pile.

"Previously, Volumetric Compensation, in most cases, was only applied on large high-performance machine tools due to the high cost of the equipment necessary to gather the data points, as well as the lengthy time it takes to complete the procedure," said a company spokesperson. "Despite the costs, there is still quite a lot of demand for less expensive machines to obtain the type of accuracy and repeatability that only Volumetric Compensation can give. Therefore, as requested by our customers, Fagor Automation has developed a new feature we call 'Easy Volumetric.'"

Volumetric Compensation—What It Is

"Applications requiring acute accuracy—not just on individual applications, but also in uniformed applications that tie together, as frequently seen in the aerospace market—have become commonplace," said the spokesperson. "For over 30 years, traditionally offered linear compensation tables have been the final solution for providing machine tool accuracy. However, to comply with global accuracy standards, as frequently required within the aerospace industry, these conventional compensation tools are insufficient considering they do not take into account the machine's kinematics and other fac-

tors related to the mechanical and electrical relationship between the multiple combinations of axes of motion."

Primary causes of the lack of machine tool accuracy and precision derive from geometric machine errors that can arise during manufacturing and assembly and also in production machine wear and abuse, which can cause premature deformations of the machine.

The Volumetric Compensation feature corrects these geometric errors, thus improving machine tool repeatability and accuracy. The volume to be compensated is defined by a cloud of points, in each of which the error to be corrected is measured. This error is recorded in a file that is then uploaded to the CNC. Therefore, the conventional compensation tools must be complemented with more advanced tools that adapt to the different designs of the machine and their specific kinematic.

"Volumetric Compensation can be an expensive feature that requires expensive hardware—as well as valuable time—to gather all compensation data points and then apply to the CNC," said the spokesperson. "This expense is well accepted for large high-performance machine tools, but is much more difficult to justify for small to mid-size machine tools. Hence, in conjunction with our customer's request, this is why Fagor has developed Easy Volumetric that simplifies the process, thus making it not just an acceptable process, but desirable for all machines."

Easy Volumetric Compensation

"Easy Volumetric Compensation limits the points to just 25 per axis, thus is much faster to calibrate the points and integrate to the CNC," said the spokesperson. "It improves accuracy dramatically, yet is fast and easy to integrate. This is a groundbreaking development for small machines."



Both the Fagor 8065 and 8070 CNC platforms allow for both complex medium/large machine Volumetric Compensation or the Easy Volumetric compensation. Traditional ball screw and backlash compensation can still be utilized, but is not necessary since Volumetric compensates for these errors as well. However, operators can still utilize these tables and the CNC will automat-

ically integrate them into the compensation matrix.

Easy (basic) volumetric compensation overview:

- The volume to be compensated is defined by up to 25 points on each axis
- This compensation corrects translation errors
- The compensation tables are generated by the calibration application; they are not editable from the CNC
- The OEM must define all the compensation data (axes that move, axes to be compensated, position and the size of the volume to be compensated, etc.) in the machine parameters and select the file containing the compensation data
- The basic compensation is the fastest to calibrate, but it can be less precise than the others (it corrects fewer error components).

Medium/large machine volumetric compensation overview:

- Volume compensation up to 10 cu. m (medium) or more than 10 cu. m (large).
- This compensation corrects the 21 geometric error components (translation, rotation and squaring).
- The compensation tables are generated by the calibration application; they are not editable from the CNC.
- The OEM only needs to define the axes to be compensated in the machine parameters and select the file containing the calibration data. The rest of the data (axes that move, error to be compensated, etc.) are implicit in the file.
- Medium and large compensations are more precise than basic compensation,

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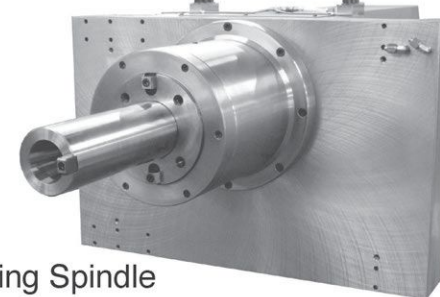
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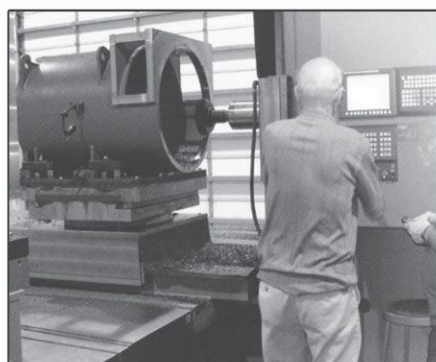
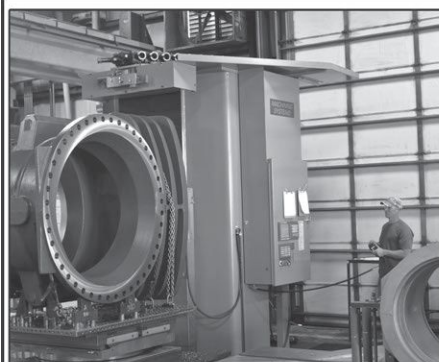


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but they are slower to calibrate.

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2250 Estes Avenue
Elk Grove Village, IL 60007
fagorusa@fagor-automation.com
fagorautomation.us

Wayne Nelson
Fagor East Coast Operations
800-423-2467 ext. 301

Easy to Install Incremental Encoder

Renishaw offers an encoder family for linear axes that features wide installation tolerances and axis speeds of up to 24 meters per second. The QUANTiC encoder series produces a digital signal output directly from the readhead and eliminates the requirement for additional bulky external interfaces. This approach was first used for Renishaw's advanced VIONiC encoders.

"In OEM applications, machine build speed is critical," said a company spokesperson. "Swift component installation reduces lead times and increases profitability. QUANTiC encoders have been designed with this in mind and feature Renishaw's widest ever set-up tolerances, exceptional dirt immunity and the optional Advanced Diagnostic Tool (ADT) for remote calibration and in-depth diagnostics."

The QUANTiC encoder system uses a 40 μ m-pitch scale, which translates to larger installation tolerances and higher operating speeds due to the optical design of Renishaw encoders. For instance, readhead installation rideheight and yaw tolerances are now ± 0.2 mm and $\pm 0.9^\circ$ respectively. Available scale options include RTL40 for carrier track (FAST-TRACK) mounting and self-adhesive RTL40-S: both simplify thermal error compensation by allowing independent scale expansion relative to the substrate.

The QUANTiC encoder system is highly immune to dirt and contamination due to several advanced design features. QUANTiC readheads incorporate Renishaw's filtering optics that averages the contributions from many scale periods and effectively filters out non-periodic features such as dirt. Measurement signals are further enhanced by a range of electronic signal processing algorithms such as Auto Gain Control (AGC), Auto Offset Control (AOC) and Auto Balance Control (ABC). QUANTiC encoders also feature a third layer of signal filtering from a new detector design which helps to eliminate non-harmonic signal frequencies that can occur due to contamination on the scale. These signal conditioning features combine to ensure low Sub-Divisional Error (SDE) and minimal signal variation over contamination.

Ease of both set-up and calibration is supported by an Advanced Diagnostic Tool (ADT) that combines both ADTi-100 hardware and ADT View software components. Features and benefits include: remote monitoring; visual and audio indication of signal size limit switches and readhead pitch; DRO output; Lissajous output; and the ability to save data in multiple com-



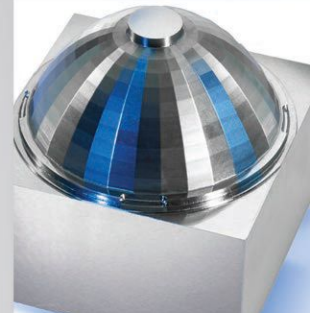
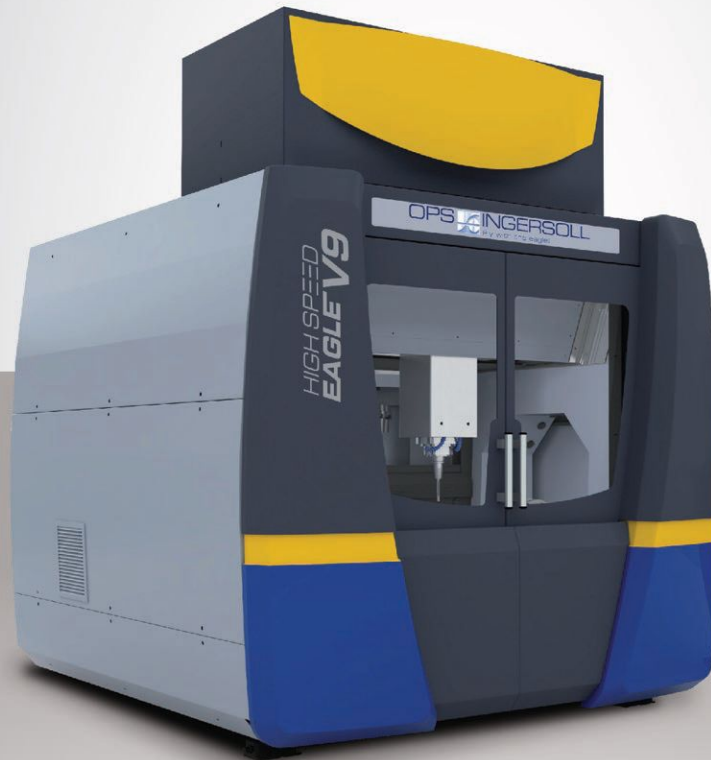
mon file formats.

"QUANTiC encoders are designed to help speed up the pace of mass production lines and offer potentially significant time and cost savings for OEM customers," said the spokesperson. The QUANTiC family has CE approval and is manufactured by Renishaw, using strict quality controlled processes that are certified to ISO 9001:2008.

For more information contact:

Renishaw, Inc.
1001 Wesemann Dr.
West Dundee, IL 60118
847-286-9953
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"The smallest controller in its class, the ultra-compact YRC1000micro minimizes installation space and optimizes performance with power and precision," said a Yaskawa Motoman spokesperson.

A small footprint and lightweight cabinet make the YRC1000micro suitable for factories with high density layouts, where stacking of controllers may be required. This space-saving design



enables installation in either a vertical or horizontal position, as well as within a 19" rack, accommodating a wide range of layouts.

Optimized acceleration / deceleration control can improve the robot's cycle time up to 10%, and high path accuracy control enables increased precision in trajectory performance independently of motion speed. "Its robust motion software allows for highly accurate path planning, often resulting in reduced cycle times," said the spokesperson.

A single controller-to-robot cable is designed to improve cable reliability,

and interactive preventive maintenance data allows for simplified maintenance scheduling and robot performance analysis.

The YRC1000micro is offered with select Yaskawa Motoman robot models.

The YRC1000micro features an ergonomic, lightweight teach pendant with a user-friendly touchscreen interface that facilitates fast and easy programming. 3-D simulation of robot motion can be evaluated on screen before or during robot execution, and a USB connection allows service staff to directly connect for remote service purposes.

An SD card slot enables easy transfer of job programs.

For select Yaskawa Motoman robot models, the YRC1000micro is available with the Smart Pendant. Suitable for novice users, the Smart Pendant offers an intuitive interface that easily adapts to the user's style for easy operation.

For more information contact:
Yaskawa America, Inc.
Motoman Robotics Division
100 Automation Way
Miamisburg, OH 45342
937-847-6200
www.motoman.com

Dual PC for Retrofit CNC

Calmotion, a CNC engineering organization, has released a dual PC package complementing the 527F retrofit CNC product line for legacy machines made by Fadal. The dual PC enhances the productivity of a machine tool by adding the power of a desktop PC at the machine tool.

A push button on the front of the drawer assembly switches video from either the 527F CNC or the PC. An operator can use the latest networking tools to drag and drop files over the network to the 16 GB of available storage space on the 527F CNC. A CAD or CAM package can also be loaded on the PC for part program generation or modification without having to leave the machine tool. Other uses include the accessibility of job set-up sheets in PDF format, editing of NC programs in a PC environment and more. The added computer runs independently of the CNC control ensuring that the operation of the machine tool is not affected by the use of the PC.

"Calmotion understands the constant changing landscape of networking and software within the manufacturing industry," said Glenn de Caussin, President of Calmotion LLC. "Manufacturers require more information at the CNC where operators can react quickly with the latest software tools at their



disposal."

The 527F Dual PC option has been designed for small form factor PCs such as the NUC product line from Intel. A large number of available NUC computers ensure that a user can find the ideal performance and cost for their use.

For more information contact:
Calmotion LLC
7536 San Fernando Road
Sun Valley, CA 91352
818-357-5826
www.calmotion.com

Encoders for Servo Motors

Kuebler's Sendix 36 motor feedback system is designed to operate servo motors of various sizes, performance levels, electrical interfaces and technical requirements, including high rotational speed and high temperature—making it suitable for semiconductor manufacturing, packaging and other factory automation systems.

With its compact 36 mm housing, the S36 is equipped to handle all singleturn and multiturn variants, as well as all medium to high power ranges.

By reducing the number of motor variants, it saves space and operating costs. The S36 is designed to reliably operate motors in harsh, unforgiving environments. Using phased array sensor technology, it maintains consistently high signal quality in the presence of shock and vibration, achieving resolutions up to 2,048 ppr sin/cos or 24 bits (fully digital).


It also integrates Kuebler's proprietary Safety-Lock design consisting of interlocked bearings, strengthened outer

bearings and large bearing size relative to the size of the encoder. Other mechanical features include a wide temperature range (-30° to +120 °C), torque-proof stator couplings and vibration-proof plug connectors. The S36 also has a SIL3 rating for use in safety applications.

Sendix S36 encoders support all classical interfaces, including RS485 + Sin/Cos (HIPERFACE compatible), BiSS, BiSS Safety, BiSS-Line and HIPERFACE DSL, as well as open-source interfaces for the Single Cable Solution (SCS).



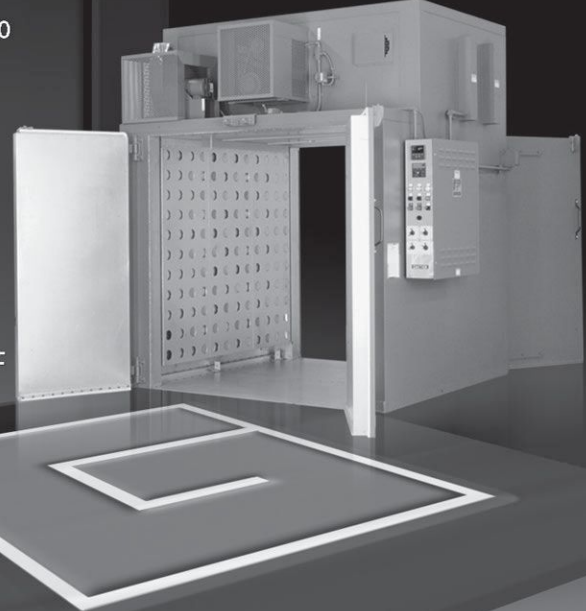
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Programmable Multi-Axis Controller

Global industrial automation solutions provider Omron Automation Americas offers a programmable multi-axis controller in its CK3M family. "This next-generation motion controller delivers never-before-seen output speeds and enables nano-level, high-precision positioning," said an Omron spokesperson.

Motion controller output speeds are reaching 50 μ s/5 axes with the controller from Omron. "Omron combined superior motion control capability originally developed by Delta Tau Systems (now part of Omron) with its own advanced design technologies inside a compact and streamlined housing," added the spokesperson.

Built with the needs of automotive and semiconductor manufacturing in mind, the CK3M controller allows nanoscale motion control designed to keep production lines flexible enough to accommodate the needs of the future. Both of these industries are facing more complex manufacturing requirements, such as increasingly miniaturized, 3-D-structured semiconductor devices and more complex automotive components (both internal and external) that incorporate more diverse materials than before.

Today's manufacturing machines – as well as those of the future – require increasingly precise positioning and path control that can be most effectively achieved through the synchro-

nized control of high-resolution encoders, motors and other devices. The CK3M is designed to facilitate fully synchronized motion control by providing connectivity to virtually any motor or encoder using EtherCAT and encoder communication protocols.

"Machine builders can avoid developing their own controller boards as well as specialized control algorithms to integrate a separate controller for each device when just a single controller is needed for high-speed synchronized control," said the spokesperson. "As an all-in-one control solution, the CK3M significantly lowers the cost of design changes due to the discontinuation of used parts. In addition to the benefits of fully synchronized motion control, the CK3M makes it possible to use ANSI C or an original programming language so that machine builders can create their own control algorithms."

Machine builders can incorporate their own advanced control with its support for ANSI C or an original programming language.

For more information contact:
Omron Automation Americas
2895 Greenspoint Parkway
Suite 200
Hoffman Estates, IL 60169
800-556-6766
847-843-7900
omroninfo@omron.com
automation.omron.com

DRO with Improved Interface and Touchscreen

HEIDENHAIN's newest digital readout (DRO) is designed to provide machinists with significant advantages and more reliable tools to better utilize their manually-operated machine tools (with up to four axes). Called the ND 7013 model, this DRO replaces the ND 780 and offers an improved user interface and user-friendly touchscreen, among other improvements.

This ND 7013 DRO offers an improved status bar on the right side of the main screen that provides helpful options for selecting the respective operating status. A quick access menu allows the user to view or select multiple options such as displaying length and angle values, presets and tools, a stopwatch or calculator, feedrates, an edge finder (in milling mode), as well as an "Auxiliary Functions" key.

An I/O function is available on this new DRO providing additional useful enhancements for supporting machine functions.

The changeover from the conventional HEIDENHAIN keyboard to the touchscreen facilitates operation and makes custom settings possible. It provides increased protection from the ingress of dirt and liquids and improves suitability for a workshop environment.



The custom settings are done by configuring keys that are used to switch or control actuators in the machine. Furthermore, with a keystroke, a machinist can call documents (operating instructions, machine manual, tables, etc.) and display them on the screen. If spindle control is activated on the ND 7013 I/O, the user can also define keys for presetting the spindle speed. These custom-defined keys are then included in an OEM bar that can be dragged into the screen, if required.

For more information contact:
HEIDENHAIN Corporation
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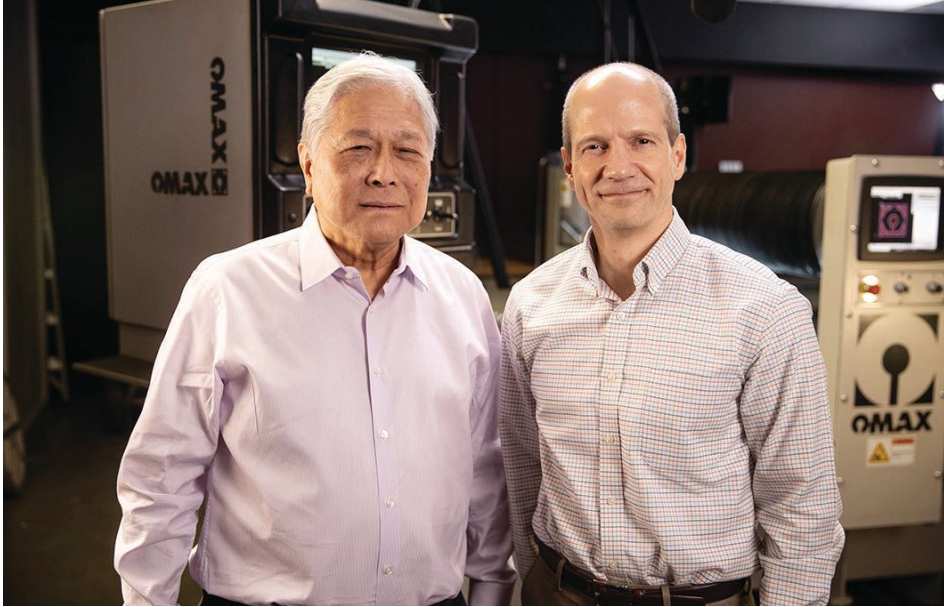
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OMAX and Hypertherm Form Waterjet Offering



(l-r) OMAX co-founder and CEO John Cheung and Hypertherm president and CEO Evan Smith

OMAX Corporation, a manufacturer of abrasive waterjet systems, and Hypertherm, a U.S. based manufacturer of industrial cutting systems and software, have announced the closing of a previously announced agreement to establish OMAX as a wholly-owned subsidiary of Hypertherm.

The agreement formally combines OMAX's direct drive pumps, software and applications technologies with Hypertherm's complementary portfolio of intensifier-based pumps and abrasive recycling systems to form the waterjet technology offering.

"As one of the world's top water-

jet manufacturers, we are excited to officially join forces with a company that shares our values and vision to deliver the industry's broadest and most technologically advanced line-up of waterjet products," said OMAX Co-founder and CEO John Cheung. "The Hypertherm culture and business philosophy is remarkably similar and complementary to OMAX, and I have no doubt, the company I founded will keep a keen focus on the needs of our valued customers, as we have done for the past 25 years. The OMAX Corporation, and all it stands for, is in great hands with a very bright future ahead of it."

"We are confident the combination of OMAX and Hypertherm will advance our strategy of delivering diverse, technology-driven cutting solutions focused on dramatic improvements in customer outcomes. In uniting with OMAX, Hypertherm can combine the strengths of two highly talented engineering groups—OMAX engineers in Washington state with our waterjet group in Minnesota—to accelerate new waterjet technologies to market," said Hypertherm President and CEO Evan Smith. "We have great respect for OMAX and its products and look forward to working closely with the OMAX team to build upon its

founding legacy."

For more information contact:
OMAX Corporation
21409 72nd Ave. South
Kent, WA 98032
800-838-0343 / 253-872-2300
omax@omax.com
www.omax.com

Hypertherm Inc.
P.O. Box 5010 / 21 Great Hollow Rd.
Hanover, NH 03755
603-643-3441
info@hypertherm.com
www.hypertherm.com

Eastern Lift Receives 2018 Dealer of Excellence Award

Yale Materials Handling Corporation (Yale) recently recognized its top performing dealers with the 2018 Dealer of Excellence award. For an 18th consecutive year, Eastern Lift Truck Co., Inc. was on the list.

Bob Sattler, Yale VP of Dealer Business Development, stated, "Yale recognizes dealerships that have exhibited focused leadership, and continue to drive their customers to the highest level of performance in all functional areas of materials handling. In order to achieve this status, Eastern Lift met rigorous business practice standards and performance criteria which are assessed and modified annually to ensure alignment with evolving customer expectations and heightened industry demands."

Eastern Lift's President, Dan Pruitt,

said, "Achieving Yale's highest dealer award for 18 consecutive years is a testament to our employees' dedication and consistent sales and aftermarket efforts. Our team strives to provide the best customer experience in the industry, and we will never rest on our laurels. Eastern Lift Truck Co. is always working on improvements that benefit our customers."

Eastern Lift employs more than 850 material handling and storage professionals at 16 facilities located throughout the Mid-Atlantic region.

For more information contact:
Eastern Lift Truck Co., Inc.
549 E. Linwood Ave.
Maple Shade, NJ 08052
easternlifttruck.com
856-779-8880
www.easternlifttruck.com



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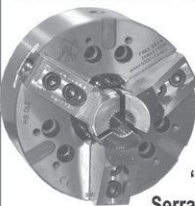
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B206	6"	0.472	0.787	2"	RKT-6200A	\$ 72.61
B208	8"	0.551	0.984	2"	RKT-8200A	\$ 85.36
B210	10"	0.630	1.181	2"	RKT-10200A	\$126.28
B12	12"	0.709	1.181	2"	RKT-12200A	\$184.71
B212	12"	0.827	1.181	2"	RKT-12208A	\$184.71

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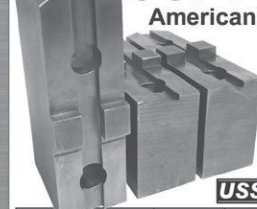
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8"	.313	.500	3/8	1.750	2"	TG-8200F	\$ 22.15
					3"	TG-8300F	\$ 64.44
10"	.500	.750	1/2	2.125	2"	TG-10200F	\$ 33.83
					4"	TG-10400F	\$ 75.33
12"	.500	.750	1/2	2.500	2"	TG-12200F	\$ 54.75

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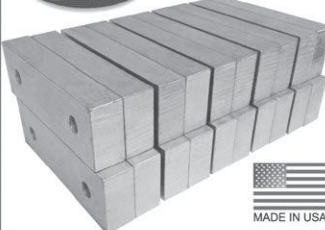
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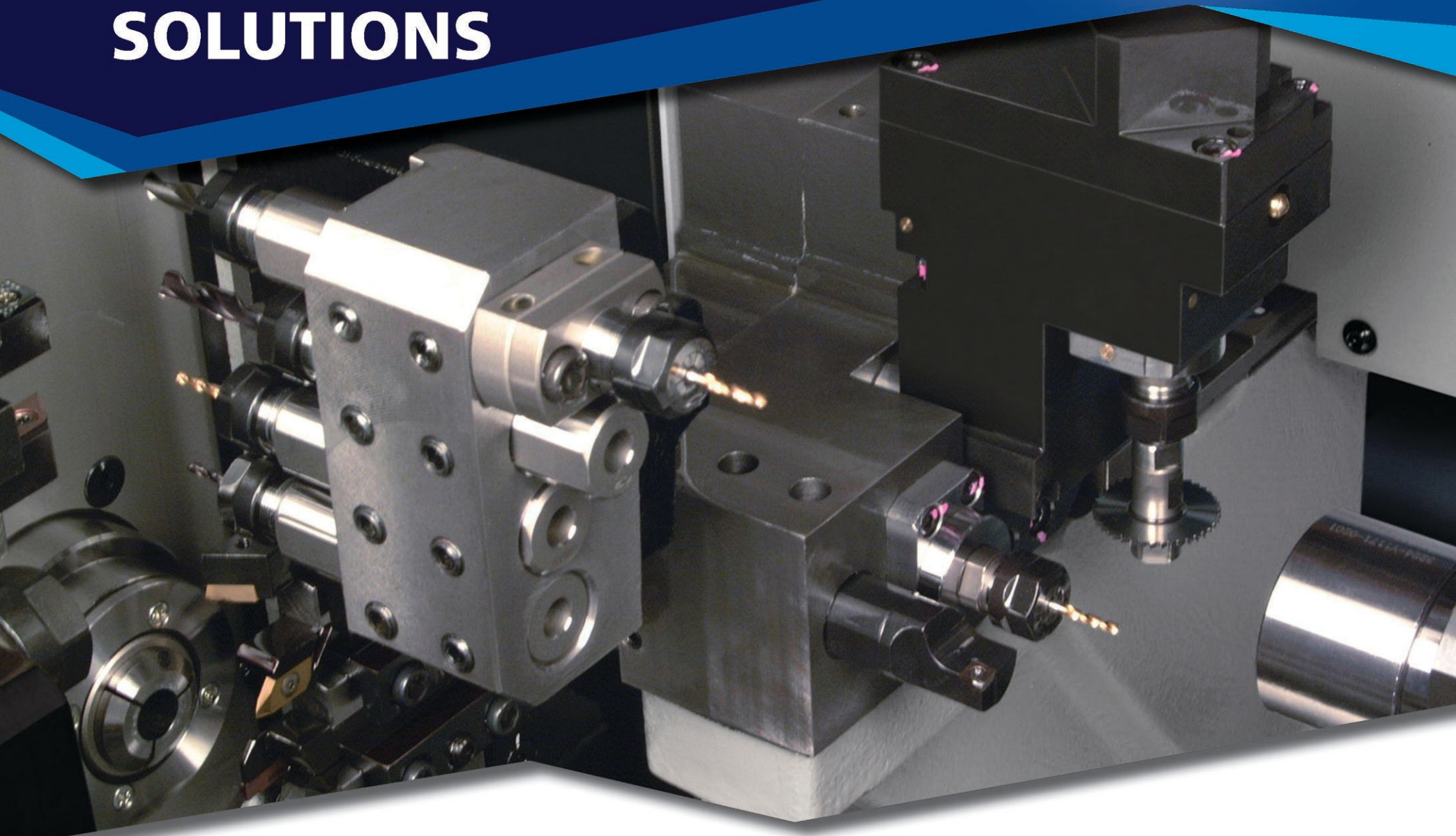
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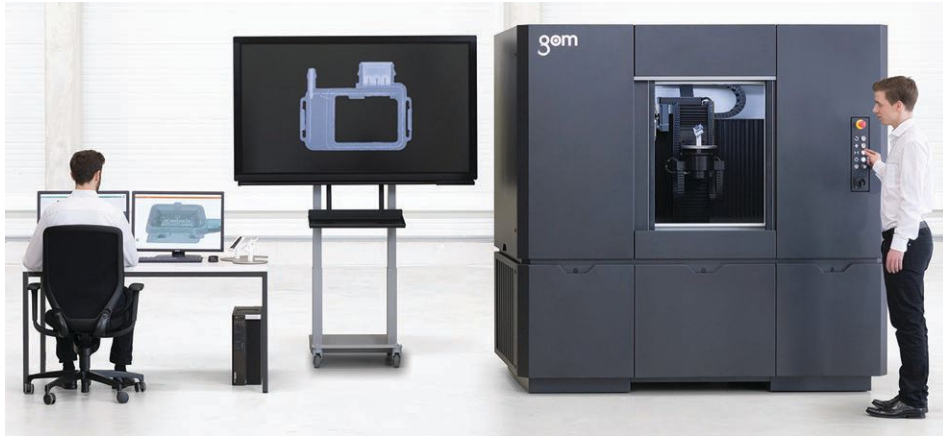
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Exact Metrology Now Represents GOM CT in U.S.



Effective immediately, Exact Metrology has become a distributor of the GOM CT scanner in the U.S. The announcement was made by company copresidents Steve Young and Dean Solberg. GOM is an established global company and provider in structured light scanning technologies. The company develops, produces and distributes software, machines and systems for industrial and automated 3-D coordinate measuring technology, 3-D computed tomography, as well as 3-D testing based on the latest research results and innovative technologies.

The computed tomography scanner GOM CT provides 3-D data of internal and external component geometries in high resolution. "The GOM CT produces the finest details visible throughout the component, simplifying initial sampling, tool correction and inspection tasks during production," said a company spokesperson. It captures complex components including the "inner workings" in a single scanning process, so that the user receives a complete image of the test specimen for form and position analysis or nominal/actual comparisons. The system shows its greatest strengths when digitizing smaller plastic and light metal parts.

High-Contrast X-ray Detector and 5-Axis Kinematics

To achieve a high level of detail during component digitization, the components of the GOM CT were perfectly matched to each other: A high-contrast 3k X-ray detector generates a very fine pixel grid (3008 x 2512 pixels) and thus lays the foundation for high-precision detection of the measured components. Five-axis kinematics with integrated centering table makes it easier for the user to position the component optimally in the measuring volume, so that the measurement is always performed with the best possible resolution. An additional plus: Within the measuring volume (diameter: 240 mm, height: 400 mm) several objects can be measured simultaneously in one scan, further reducing processing times. "Thanks to the proven GOM technology the GOM CT ensures high precision and repeatable measurement results," said the spokesperson.

Data Acquisition and Evaluation in One Software Package

As with all GOM metrology systems, the control of the device, data acquisition and evaluation are combined in a single software package. This means that no further software is required; the chain from recording the raw data to

creating the measurement report is greatly simplified.

Exact Metrology will house a GOM CT scanner at its Brookfield, WI, location. Once there, it will be used for customer demonstrations and educational purposes, as well as contract scanning.

For more information contact:

Steve Young
20515 Industry Avenue
Brookfield, WI 53045
262-533-0800 / 866-722-2600
stevey@exactmetrology.com
www.exactmetrology.com/
metrology-equipment/
gom-ct-scanner

Northrop Grumman Recognized with Manufacturing Leadership Awards



An F-35 technician measures the gaps between the frames and the ducts on the forward left inlet duct for the F-35 center fuselage. A core structure of the F-35 Lightning II aircraft, the center fuselage is produced on Northrop Grumman's integrated assembly line at its Palmdale Aircraft Integration Center of Excellence.

Northrop Grumman Corporation has been recognized by the National Association of Manufacturers with Manufacturing Leadership Awards for three of its aircraft manufacturing capabilities. The cutting-edge capabilities harness metadata, analytics and virtual and augmented reality in multiple Northrop Grumman manufacturing programs.

"We have a rich history of manufacturing the most advanced products in the world," said Kevin Mitchell, Sector Vice President, Global Operations, Northrop Grumman Aerospace Systems. "Today, we use a variety of manufacturing techniques to develop the capabilities to support our customer's toughest missions. We are honored to be recognized for our leadership in manufacturing."

The company was recognized for the following technologies:

- The assembly metadata integration project extracts quality data from automated systems on Northrop Grumman's F-35 Integrated Assembly Line. It uses advanced analytics to mine data and automate an otherwise tedious manual effort for identifying discrepancies, generating reports, evaluating and documenting the quality data and defining and directing corrective action.
- The analytics-enabled complex assemblies (ACA) capability leverages analytics to assemble complex airplane parts of diverse material types. It enables Northrop Grumman to machine complex parts on divergent machines and then drill precision hole-bores. This

project reduces complexity, cost, facility requirements and risk while improving throughput and design change sensitivity. Northrop Grumman uses this capability on both its manned and autonomous aircraft systems, including the High Altitude Long Endurance family of systems that comprise programs like the U.S. Navy's MQ-4C Triton and U.S. Air Force's RQ-4 Global Hawk.

- Northrop Grumman leverages augmented reality (AR), virtual reality (VR) and 3-D analytics to improve airframe manufacturing processes. This enables the company to capture and analyze data to gain meaningful insights into manufacturing challenges experienced by human tasks. By combining airframe manufacturing data with artificial intelligence/machine learning, AR and VR, Northrop Grumman captures human variability and work content that reduces rework, disruption and downtime. Similar to the ACA capability, this can be used across the spectrum of Northrop Grumman aircraft programs.

Northrop Grumman will be recognized at the 15th Annual Manufacturing Leadership Awards Gala in conjunction with the Manufacturing Leadership Summit June 10-12 in Huntington Beach, CA.

For more information contact:
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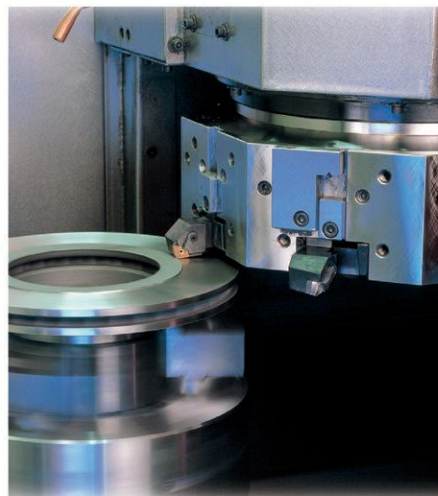
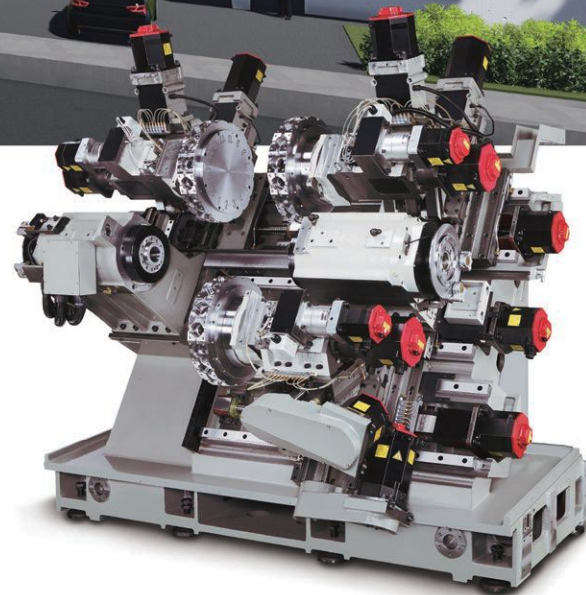
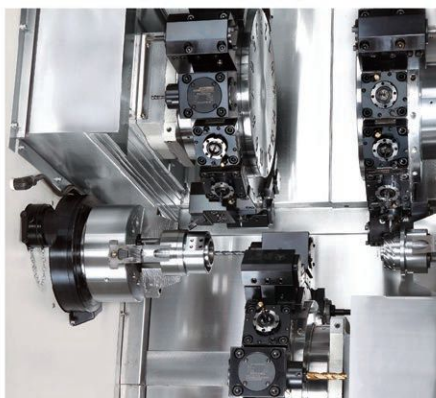
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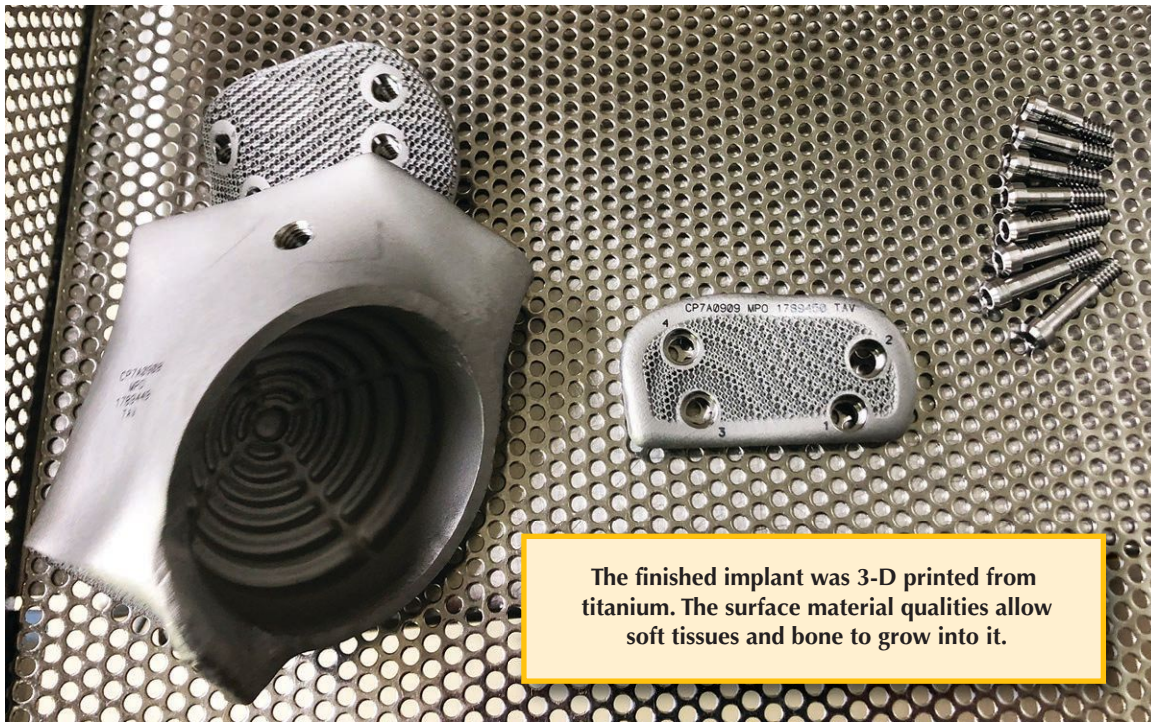
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3-D Technology Reduces Lead Times, Enables Customization



The finished implant was 3-D printed from titanium. The surface material qualities allow soft tissues and bone to grow into it.

With the latest technological advancements in 3-D printing, highly complex bone reconstruction is now a reality.

Orthopedic specialists for years have been developing the technology to model and then create reconstructions of bone defects (often due to tumors or trauma). However, lead times, even up to a decade ago, were too long. It is only in the last few years that lead times have been reduced—allowing re-

construction to become feasible not just for complex cases, but for time-sensitive cases as well. With the latest 3-D printing technology, turnaround time can be as fast as six weeks—a significant leap from the previous six-plus-month lead time. This means new surgery options, more precise bone reconstructions, along with the real possibility of a higher quality of life for patients post-op.

Take, for example, one recent case

involving chondrosarcoma of the pelvis, a type of bone cancer that is resistant to chemotherapy and radiation therapy. The portion of the bone with the cancerous tumor had to be removed, along with a margin of normal tissue.

Long bone reconstruction is fairly straightforward because the arm and leg bones are essentially a cylinder shape. However, in this particular case, the cancerous tumor was in the pelvis, and involved the socket portion that holds the hip joint. Reconstructing this area is already a tricky procedure, but in this situation, due to lack of treatment options, a fast turnaround was also essential.

Dr. Ron Hugate, an orthopedic oncologist at Panorama Orthopedics and Spine Center, has had experience with complex cases such as this one. He recognized that this patient would be an ideal candidate for the latest 3-D printing technology. The plan was to first re-

move the cancer, and then reconstruct the pelvis and restore the patient's functions.

Moving Beyond Traditional Solutions

"The cancerous tumor was in a difficult location—a lot of important structures are in the pelvis," said Dr. Hugate. "Due to the complex shape of the pelvis, an implant could not be easily manufactured using traditional techniques with CNC."

Other issues with traditional techniques included limitations in shapes, sizes and surface treatments. "A newer trend in orthopedics involves using a solid implant with a porous structure—almost like a honeycomb—on the surface," said Dr. Hugate. "This allows the bone and the soft tissues to actually grow into the implant. If you use traditional means, you have to create a solid base, and then either adhere or sinter porous metal wafers onto the material. It is a less-than-ideal manufacturing technique, and causes difficulties when certain shapes are required."

3-D printing allows the creation of almost any shape required, and does not need special machining to achieve this. A porous surface can easily be added during the printing process.

Continued on Page 46

Choosing an Optimum Machining Solution for Aerospace Components

Producing complex aerospace parts such as vanes, blisks and impellers requires a particularly fast, very precise, and extremely dynamic machining center. For manufacturing critical components used in engine and turbine construction, this means a 5-axis machining center. Machines for highly dynamic milling with five simultaneously controlled axes are essential for producing reliable aircraft engine components.

A developer of CNC-controlled vertical milling and turning centers, the CHIRON Group recently brought a machining center to market precisely matched to the special requirements of the aviation sector: the FZ 16 S 5-axis with 5-axis tilt rotary table.

"Optimum solutions for machining complex aerospace workpieces from exotic materials must provide superior rigidity for stable machining; high spindle speeds to make best use of cutting tools designed for shaping challenging metals; and rapid axis positioning to minimize cycle times. The result is production of high precision parts with high quality surface finishes in minimum time," said a company spokesperson.

The mineral cast machine bed of the CHIRON FZ 16, with rigid gantry

design, offers a high degree of stiffness and optimum damping characteristics. "High-performance motors, two Y-axis drives, as well as short spindle



start-up and braking times are the foundation for the machine's extreme speed," said the spokesperson. "A-axes and C-axes equipped with direct drives deliver even greater dynamics. These machine characteristics assure precise multi-axis motion and smooth acceleration, which are fundamental

requirements for high-level aerospace manufacturing."

"A key development for the Chiron machines in providing greater stability for

the spokesperson. "This construction will be seen in future Chiron Group machines. The base is a vibration-dampening, highly stable concrete material that is less sensitive to heat than cast iron or steel weldments. Even during heavy cuts, the machine runs nearly without vibration or noise."

Combining high precision metal removal with high feedrates yields a machine that can hog material while delivering high quality surfaces. "This capability will be of great interest to the pump, compressor, aerospace components, mold and die, and automotive industries that produce complex parts from high alloy and exotic metals such as titanium, Inconel and stainless steels," said the spokesperson. "The ability to produce finished parts rapidly in a single set-up saves cycle time and avoids the need for secondary operations."

"The exotic materials used for aerospace applications present challenging demands for high accuracy machining," said Markus Löhe, Aerospace Sales Engineer, CHIRON. "The complex geometries and need for smooth surfaces require 5-axis simultaneous machining capability."

Continued on Page 48

"The manufacturing operations for complex precision parts in the aerospace sector require a particularly fast, very precise and extremely dynamic machining center," said a CHIRON spokesperson.

the heavier cuts and the rapid axis positioning in the gantry-style construction rather than a C-frame," continued

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3-D Technology Reduces Lead Times, Enables Customization

Continued
from Page 44

Six-Week Lead Time

Dr. Hugate partnered with a team of engineers to create a personalized implant design. This was accomplished using patient imaging data: A CT scan was used to assess the bony topography, and an MRI to determine the extent of the tumor. Each imaging study was then merged together and converted into a 3-D model.

Using the model, Dr. Hugate met with the engineers and specified design parameters for the implant (hip socket size and position, location of porous material, etc.). They then developed a surgical plan with the use of patient-specific models, guides and templates.

"You have to have a margin of normal tissues that you take out with the tumor," said Dr. Hugate. "I typically add about 1 cm to the dimensions of the tumor, just to make sure that when we make the bone cut, we will remove all of the cancer cells. We then create 3-D printed cutting jigs that actually lay onto the bone in specific areas. These direct me where to make my bone cuts, and they give me a very precise section. The implant is an exact replica of the removed bone,



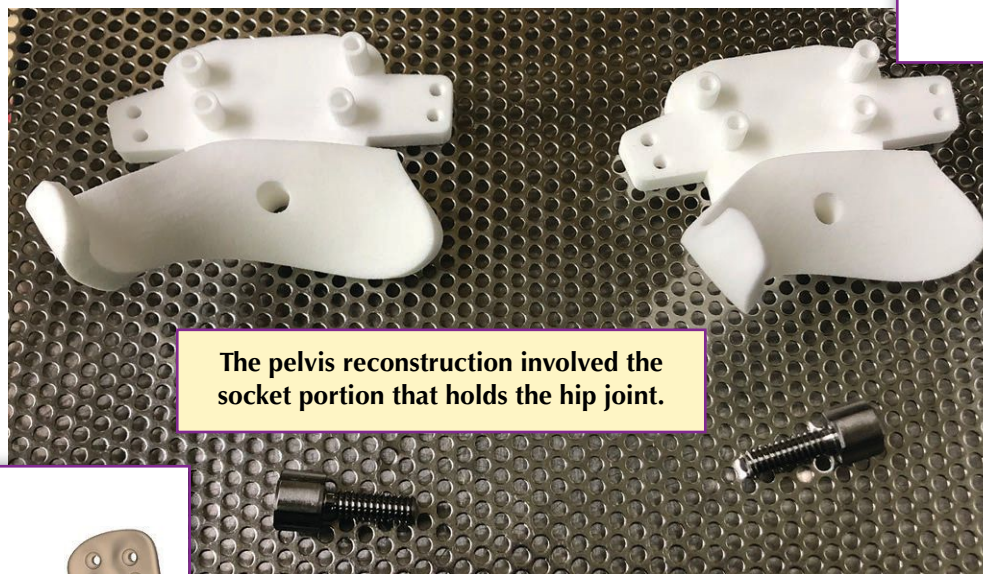
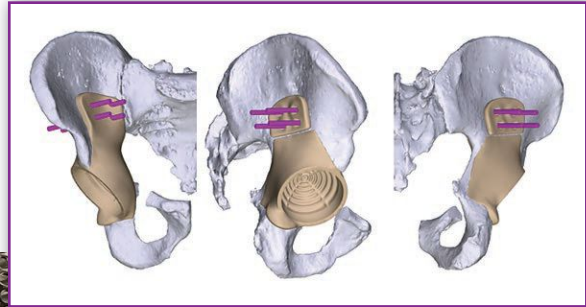
A time-sensitive pelvis reconstruction was achievable with 3-D printing technology.

Customized Surgery

According to Dr. Hugate, 3-D printing is starting to be used more in routine joint replacements. "Standard knee replacements are not customized to the individual," he said. "Typically, a surgeon will have an assortment of

3D Systems has a fleet of DMP Flex 350 metal 3-D printers that are used for implant manufacturing. With a build volume of 275 mm x 275 mm x 380 mm (10.82" x 10.82" x 14.96"), the DMP Flex 350 enables short set-up times and greater production speeds of final parts with excellent mechanical properties and reduced material waste.

In addition to 3D Systems' direct metal printing capabilities, it employs a variety of other 3-D technologies for some of its other services. For example, VSP (Virtual Surgical Planning) is a 510(k) FDA cleared service that allows surgeons to pre-plan their upcoming surgeries in a 3-D environment prior to entering the operating room. This offering begins with a patient CT scan which is processed using D2P software by a team of engineers. Next, the surgeon and a 3D Systems biomedical engineer participate in a web meeting during which the surgeon views a



The pelvis reconstruction involved the socket portion that holds the hip joint.

proved surgical outcomes and enhance surgical training. Its global teams work with surgeons, medical device companies, surgical training institutions and others in the healthcare industry to help navigate technologies and provide support for surgical planning, training, device design, personalized medical technologies and 3-D printing. From converting patient-specific CT data into digital anatomical models for surgical simulation and planning to 3-D printing more effective implants and devices, 3D technology provides a new way of looking at and solving problems in healthcare.

For more information contact:
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sizes available. During surgery, the surgeon will measure the dimension of the joint surface

3-D digital model of the patient's anatomy. The surgeon and engineer collaborate to develop a surgical plan which includes patient-specific mod-

like a perfect jigsaw puzzle piece."

The finished implant was printed from titanium, a very strong, lightweight and metabolically inert metal, so there are no issues with corrosion or fatigue. The surface material qualities allow soft tissues and bone to grow into it, making it ideal for this scenario.

Along with the hip replacement, the surgery took under three hours. "We were able to preserve all of the major muscles that control walking," said Dr. Hugate.

Dr. Hugate has also performed a reconstruction of an entire hemipelvis (half of a pelvis) using 3-D printing technology. Both cases have gone well so far, which bodes well for future cases.

"We are to the point now where we can see a patient, and six weeks later have an implant designed, manufactured, sterilized and ready to go," said Dr. Hugate. "This has made it a more viable option now, especially for cancer patients. We will be using it more and more in tumor surgery."

to be replaced, and then select one of maybe 10-15 off-the-shelf sizes. With 3-D printing, a CT scan is taken of a knee, along with the size and shape of the patient's femur. The implant is designed to match the patient's anatomy. It is then printed and available at the time of surgery. A small percentage of knee replacement implants are created using this technique. It will probably expand into hips and shoulders at some point. The customization process in orthopedics right now is largely dependent on 3-D printing."

The 3-D Printing Solution

The 3-D printed implant was created using 3D Systems technology.



The finished implant was 3-D printed from titanium. The surface material qualities allow soft tissues and bone to grow into it.

3-D printing allows the creation of almost any shape required, and does not need special machining to achieve this. A porous surface can easily be added during the printing process.



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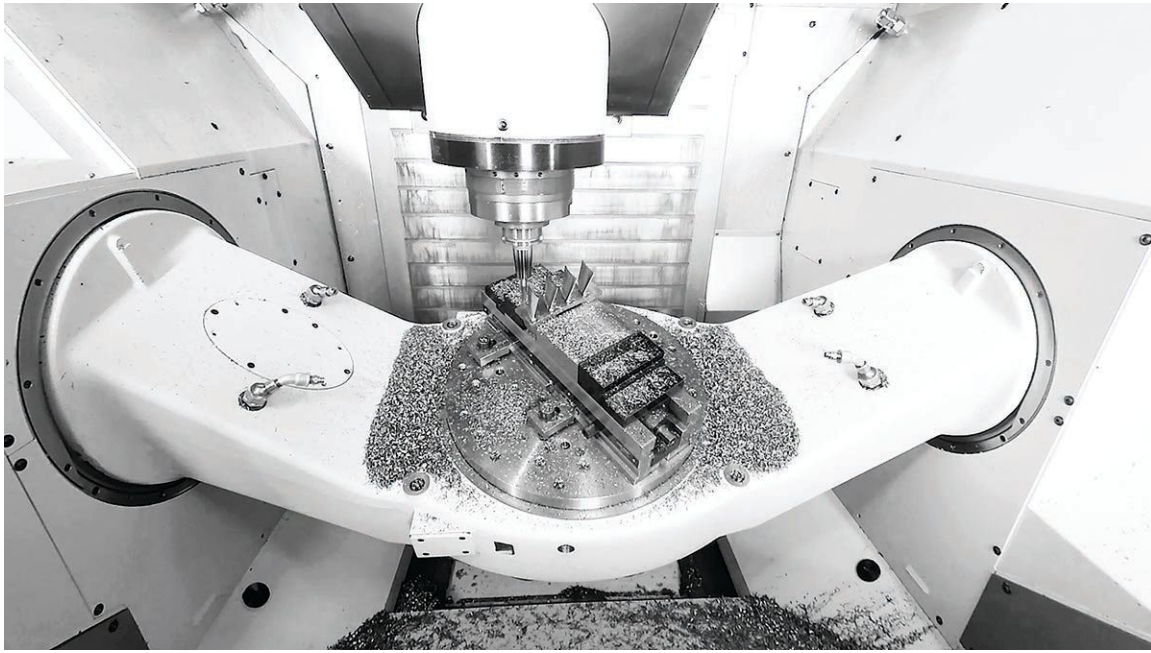
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Choosing an Optimum Machining Solution for Aerospace Components



Continued from Page 44

For example, a blisk consists of up to 120 individual blade components on a disk and has a diameter of around 800 mm. Workpieces of this kind can only be consistently produced on a fast, high accuracy machining center, such as the CHIRON FZ 16 S 5-axis.

"Blisks are currently machined on CHIRON machines from Inconel at one of our major customers in the sector, where the new FZ 16 S 5-axis machining center delivered excellent results from the first workpiece," reported Löhle.

Turn-Key Customer Solutions from CHIRON

Turn-key machines are particularly important for the aerospace sector because they reduce handling and therefore promote not only lower cycle times, but higher machining accuracy as well. These complete solutions with end-to-end automation are matched to individual customer requirements at CHIRON. The CHIRON Group generates more than a third of its revenue with turn-key machining centers every year.

In addition to the holding fixture and selecting the most effective cutting

tools, the software provided in the turn-key system also makes a contribution to greater productivity and dynamics in aerospace machining applications.

The software systems in the CHIRON SmartLine portfolio make full use of the performance offered by the machining centers. For example, maintenance work and repairs can be planned in a targeted way with the ConditionLine IT system, which allows productivity to be significantly improved. This software detects

signs of wear, as well as atypical behavior early on during operations, which helps prevent costly downtimes before they occur. In terms of CNC control systems, customers can choose between Siemens, FANUC or Heidenhain.

To see a video of the FZ 16 in action, visit www.youtube.com/watch?v=oQP0cumxVXE.

For more information contact:
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10950 Withers Cove Park Drive
Charlotte, NC 28278
704-587-9526
info@chironamerica.com
www.chironamerica.us

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(above and below) The FZ 16 S 5-axis with 5-axis tilt rotary table is designed to meet the special requirements of the aerospace sector.

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Differentiator in a Competitive Environment



Senior Service Engineer and Trainer Bob Perkins (left) trains Service Engineer Scott Lynn.

“Machine down.” Some of us can feel the gut clench just reading those words. Those two words demand an immediate response from the machine tool builder or distributor—perhaps a solution over the phone or onsite service—ASAP. Trident Machine Tools, New England’s exclusive Haas Factory Outlet, is fortifying its service structure with a multifaceted approach to ensure that is exactly what its customers experience. “Over the last six months, our service response time has improved from multiple days to now 90% of requests are serviced the same day or the next day,” said David Schmidt, Vice President of Technical Services at Trident. “When you consider the footprint of New England and the 6,000 Haas CNC machine

The company also applied cloud-based software technology to make the administrative aspects of customer support more efficient to improve response time.

HFO—Trident’s sales department has used Salesforce CRM for more than a decade and in late 2018 added Salesforce Service Cloud to maintain a more holistic record of each customer’s installation. “There is a lot of data in the background, but the user interface in the new service module—it is an app that can be accessed by any device—is clean and easy to navigate,” said Schmidt. As with any new technology, there were initial growing pains, but now the technicians are so proficient with it, they have streamlined it even

more by discovering shortcuts and sharing them with the rest of the group. “The new administrative efficiencies are such that our technicians are not sitting in parking lots writing call reports on their laptops,” said Schmidt. “They are driving to their next job.” They might be driving a sparkling new van, too. Doubling the field service staff required a new fleet of vehicles.

Since revamping and investing heavily in its service organization, the backlog of service calls has



David Schmidt, VP of Technical Services at Haas Factory Outlet—A Division of Trident Machine Tools LLC.

reduced considerably. Schmidt and his team thought perhaps that could be explained if the requests were down as well. When analyzing the call volume and case creation log, they discovered that the cases were as high or higher than before the reorganization. The backlog is at an all-time low because the technicians are closing out more jobs at a faster pace. Schmidt, citing the reasons why, said, “It is a combination of things. We have a larger staff, going from 12 to 24 certified technicians. We have also greatly improved cross-training to minimize the potential for a customer waiting for a particular skill set to become available. Further, the software application is administratively reducing the burden and the time spent on those aspects.”

tool installation base, this is quite a feat.” That feat did not happen accidentally. Schmidt came on board about 18 months ago with the mandate to double the service staff. That mandate was driven by a leadership initiative to improve customer service in general, and specifically with regard to response time. “Finding good candidates is one challenge. Ramping them up to do the job is another,” he said. Schmidt crafted a strategic training program that involved a combination of mentoring, on-the-job training and classes on Saturdays. Cross-training on all aspects of machine tool installation, service and maintenance was an outcome objective from the start, not only for its new hires but also the existing engineers who required more learning in certain areas.

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While the technology adeptness is making a positive impact on response time and customer satisfaction, the repair knowledge of even the recently hired technicians is playing a significant role in earning high marks from customers. “Haas has an excellent certification program, but how to onboard the new employees quickly, getting them productive to meet the demand, was our particular challenge here at HFO—Trident,” said Schmidt. “One important note to clarify here about ‘demand’ is we have 6,000-plus Haas CNCs installed in the region. That is a large number, and we needed to expand our bandwidth. Plus, a good percentage of them are 25 – 30 years old. Legacy machines tend to need more attention to keep them running, just like our own aging bodies do. It is just a natural phenomenon of time and wear; yet it also tells you how long a Haas machine lasts. Another marker of the machine quality is how many new parts are required. If components are failing, parts are necessary. Less than half of our repairs require parts. That is impressive.”

Regarding training, one of HFO—Trident’s certified trainers, Bob Perkins, had always taken on the task of onboarding new trainees in the administrative aspects of the job. Perkins considered Schmidt’s new goals of cross-training, evaluation with consistent measuring metrics, progress tracking and feedback communication parameters. Perkins, along with the three other certified trainers and Trident’s service manager, Dino Baldoni, developed and launched a mentoring program. On any given day, a trainee would be out with a certified field service engineer, and each trainee was assigned a mentor—one of the four certified trainers. They took on new responsibilities to touch base with their trainees at least weekly, tracking and evaluating their progress. They also made sure that their trainees were exposed to a variety of situations. The immersion included in-house training classes held on Saturdays. When the backlog of repair jobs reduced, they sometimes held classes on weekdays.

With the reduction in repair backlogs, the service team was able to add another important activity surrounding customer satisfaction—follow-up calls. If a technician is in the area where he recently made a repair, he will stop in or call the customer and do a check-up to see if the machine is still running fine and also ask if anything new needs addressing. “We had a case recently where the technician was on his way to

make a follow up visit with a customer, and that same customer was on the phone to our service department reporting a different machine was now down and required a visit,” said Schmidt. “While the work order was being processed on the phone,” Schmidt continued, “our technician



Senior Service Engineer and Trainer Bob Perkins (right) trains Service Engineer Scott Lynn on a Haas CNC machine.

was at the customer’s front desk checking in for his courtesy call, so they actually got not just same day, but same minute service!”

That customer surely was pleased, and Schmidt reports positive reactions from many customers about HFO—Trident’s service reboot. He has received complimentary emails on the quick response time and the technicians’ expertise. “I certainly enjoy getting good feedback,” he said. “We take it in, and it provides the acknowledgement that we are on the right path and we will stay moving ahead on it. We have more ideas we will be applying to make HFO—Trident’s service organization the best in the industry. The truth is, I was dealt a winning hand. We have a great team, from customer support in the office to an exceptional team in the field. And most importantly, a leadership team that fully supported the ini-



New decals being applied to the new fleet of service vans at HFO—Trident. The company has doubled its field service engineering staff within the last year.

tiative with investments in software and manpower.”

For more information contact:
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A Division of Trident
Machine Tools, LLC
651 Day Hill Road
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www.hfotrident.com

Reduction of CO₂ Emissions Through Form Honing



The future development impetus of the internal combustion engine (ICE) will focus on the reduction of emissions. This is dependent on fuel consumption, which in turn is determined by the internal engine friction. The goal of form honing is a form optimized cylinder bore under operating conditions.

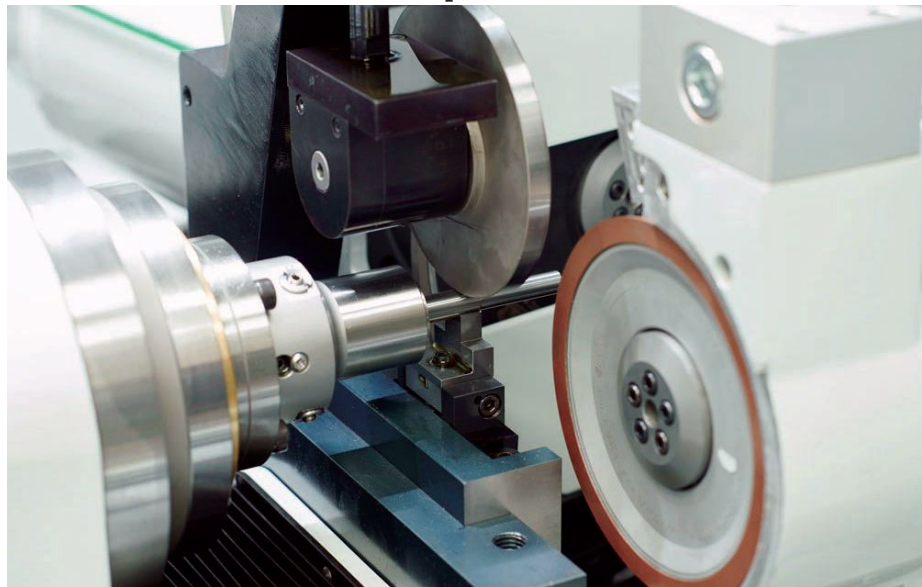
Abraham Pizano, Managing Director Gehring-Mexico, presented Gehring's CO₂ emissions reducing technology so-

lutions at a recent technical forum in Mexico to an audience of leading technical and business professionals, from a wide variety of industries, including automotive, aerospace and industrial.

The conference is one of the region's top technical events for manufacturing, featuring the latest in global manufacturing trends, including processes, applications, materials and advanced techniques.

Continued on Page 54

CPX Linear Blank Preparation Grinder



The CPX Linear has the option of the V Steady and Top Roller for tool blanks to provide rigid support and maintain low run out.

ANCA's CPX Linear is designed with a large working envelope and powerful grinding spindles to achieve high precision and productivity for blank preparation in the market today. "Using the pinch peel method of grinding it offers the same strength, rigidity and thermal stability expected from an ANCA tool grinder," said a company spokesperson.

Simon Richardson, Product Manager at ANCA said, "We have taken the

best aspects of our technology to build a fantastic machine. For example, our specially designed polymer concrete base provides the upmost stability in our grinding process so we took that and used it in the CPX Linear model."

The CPX Linear features include:

- High powered roughing spindle ensures high volume stock removal, enabling shorter cycle times and higher productivity.

Continued on Page 55

Brushed Crankshafts with a Brush Deburring Machine

The deburring of complicated engine components such as crankshafts or camshafts is usually carried out with the aid of special solutions. KADIA Produktion GmbH + Co. has added a standard brush deburring machine for this application to its product range for the first time.

Before a crankshaft reaches the finishing machine for finishing the bearings, any loose particles or flaky burrs must be removed from it. These foreign bodies could otherwise enter the new engine interior and cause damage there. The most common solution for

Continued on Page 52



The fibers of the deburring brush are made of abrasive nylon and reach every part of the crankshaft. According to KADIA, camshafts or similar eccentric workpieces can also be machined in addition to crankshafts.

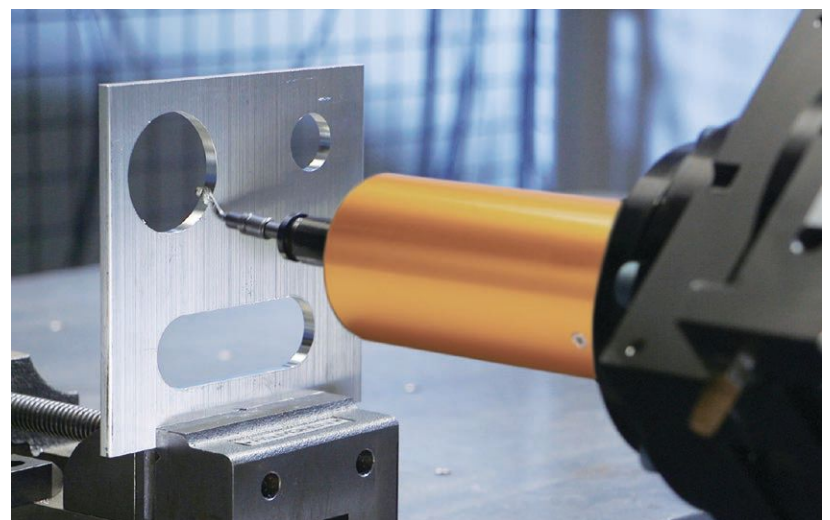
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Compliant Deburring Blade for Material Removal

ATI Industrial Automation has introduced a new Compliant Deburring Blade (CDB), its latest and most versatile deburring tool. The pneumatically-controlled, articulated design gives

users the ability to tune the contact force to accommodate specific applications by changing the air pressure. The CDB excels in light and medium deburring,

Continued on Page 52



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Brushed Crankshafts

Continued from Page 50

this process is a robot that guides the workpieces with a gripper to a deburring console equipped with different tools (brushes, discs, etc.). A complicated, complex motion sequence has to be programmed, because each workpiece edge must be brought exactly into the machining position. For each crankshaft variant, the robot must be taught again, i.e. the new coordinates must be entered and stored. This means a lot of effort for the plant support, and often also frequent downtimes. In addition, the robot takes two minutes to machine each crankshaft. However, the usual cycle times in the automotive industry are 30 to 60 seconds. As a result, engine manufacturers often operate several deburring cells in parallel in order to cope with the quantities.

"The developers at KADIA, who are familiar with these circumstances from their own experience, thus considered a new plant concept," said a company spokesperson. It was to be flexible, allow short cycle times and require little effort for support and maintenance. The result: the standard brush deburring machine EC-Brush. What sounds simple at first has several constructive tricks up its sleeve. The machine has a total of five programmable axes: one rotary drive each with right/left rotation for the brush and the workpiece. The workpiece is clamped against a point in a three-jaw chuck. The brush rotates at about 500 RPM, the crankshaft at 30 RPM. Linear axes also provide the brush's back/for-

ward and lateral oscillation movement and a traversing range for the center. The latter enables different crankshaft lengths to be clamped, so that any variant for 3- to 6-cylinder engines (for passenger cars or small commercial vehicles) can be machined in any desired succession. Loading and unloading can be carried out manually, semi-automatically or fully automatically.

The heart of the EC-Brush deburring machine is the brush, which is equipped with fibers made of abrasive nylon. Their cross-section is oval, i.e. long and short fibers adapt to the eccentric design of the crankshafts. Only one operation is required, as the shaft is completely immersed in the brush. The long fibers reach from the cheeks up to the connecting rod bearings, the short fibers machine the main bearings area. There are always certain fibers in mesh. The long ones are deflected at short workpiece distances to create an additional impact effect. Particles and flaky burrs, which typically occur during drilling or grinding, are reliably removed. The choice of fiber type allows adaptation to the component's material. Another important difference to the robot solution: the EC-Brush deburring machine allows wet machining. The workpiece is rinsed at the same time in this case.

"The main time for deburring a crankshaft is only about 20 seconds. Including loading and unloading, cycle times of about 30 seconds or just above are possible," explained Henning Klein, Managing Director at KADIA. "Three

cells are required to achieve the same output as a deburring robot, the investment costs for which are about twice as high." As this is a standard machine designed according to the modular principle, KADIA said that the delivery time is also significantly shorter than for a special solution. The small space requirement creates a further advantage. The designers at KADIA equipped their deburring ma-

chine with an inclined bed on which the brush moves back and forth. This results in a compact design with a footprint of 2.6 m x 2.3 m.

For more information contact:
KADIA USA
8020 Kensington Ct.
Brighton, MI 48116
248-446-1970
www.kadiausa.com

Compliant Deburring Blade

Continued from Page 50

chamfering and scraping operations on materials such as plastic, aluminum, steel and brass. The robust collet accommodates a variety of readily available blades and media used with hand deburring tools. The blades can be changed without the use of additional tools.

A simple mechanical design, without high-speed moving parts, makes the new blade a suitable solution for collaborative processes. The CDB's axial and radial compliance is suitable for maintaining constant force where surface irregularities are present, ensuring high

quality results. Integrating the CDB in a robotic material removal application not only reduces robotic programming time, but also makes the programming process easier. For those looking to automate manual deburring methods, ATI's CDB offers flexibility and reliability that is fast and easy to integrate.

For more information contact:
ATI Industrial Automation
1031 Goodworth Dr.
Apex, NC 27539
919-772-0115
www.ati-ia.com/CDB

Double-Side Fine Grinding Machine

Continued from Page 1

in process provides high stock removal rates. A revised working wheel cooling labyrinth with increased flow volume also helps to ensure the required and known high precision of Peter Wolters AC microLine series, such as the contactless measurement control unit.

Some features include:

- Automatic carrier loading concept with carrier exchange time ≤ 60 s
- Software functions like for example constant removal rate or automatic working wheel wear compensation
- RangeCare (remote maintenance solution via mobile communications or VPN)
- DataCare (integrated process data recording)

A Twin Loader for Maximum Efficiency

Peter Wolters AC microLine 1250-F in combination with the twin loader represents a powerful production system consisting of grinding machine and automation for automatic workpiece carrier exchange. The core of the twin loader is a rotary index table, which is used as a buffer. This reduces auxiliary process times and the machine capacity is utilized optimally. In parallel to the ongoing grinding process, the operator can unload finished parts and prepare workpiece carrier loading with unmachined parts. "Simultaneously loading and unloading of two workpiece carriers into and from the machine via twin loader significantly reduces the exchange time and increases the overall system productivity drastically," said a company spokesperson. The exchange time of 60 seconds for six workpiece carriers ranks among the best in the market. For even more efficiency, the modular twin loader can be complemented with a robot cell for workpiece carrier loading and unloading.

"The twin loader generation introduced first at EMO 2017 is a further development of the proven and established

initial twin loader," said the spokesperson. Relevant optimizations are: solid steel weld construction instead of aluminum profile frames; linear electrical unit for workpiece carrier loading and unloading; improved accessibility through new frame design; flexible selectable position for machine operator and/or robot cell for optimum adaptation to the customer's conditions as well as faster rotary table positioning via servo drive.

Robot Cell

The robot cell is an automation concept for Peter Wolters AC microLine machining tools and is equipped with a Scara robot for pick and place for workpiece loading and unloading. The robot cell also features an infeed conveyor for unmachined part feeding as well as an outfeed conveyor for removing finished parts. This enables optimum integration in existing or new production lines.

The robot cell can load and unload AC microLine machines directly. After process end, the upper machine part swivels out, providing the Scara robot with optimum access to the grinding area and thus allowing workpiece carrier loading and unloading to start. Finished part removal and subsequent loading with an unmachined part is alternated for an efficient loading and unloading time.

Furthermore, the robot cell can be combined with a twin loader for a significant increase in productivity and optimization. For this design variant, workpiece carrier loading and unloading take place in the twin loader during the processing time of the AC microLine machine, which reduces auxiliary processing times to a minimum.

For more information contact:
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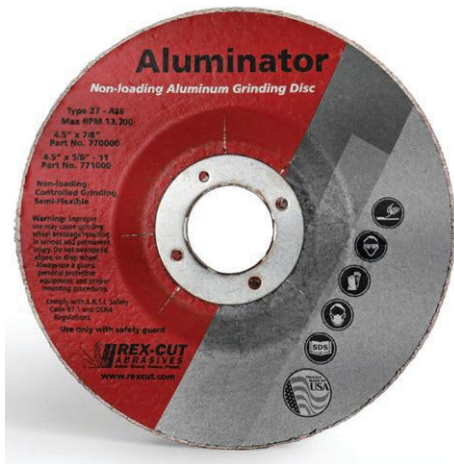
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Grinding Wheel for Aluminum



Rex-Cut Abrasives, an abrasive product manufacturer, offers its Aluminator, a solution to aluminum grinding that prevents clogging and loading.

Typically, when grinding aluminum, bonded wheels overheat the metal causing chips of aluminum to embed right into the grinding wheel, this is commonly referred to as clogging or loading. Eventually there will be no grit exposed, only deposits of aluminum on the face of the wheel. Normally a wax or grinding aid would be necessary to prevent this issue, but that is no longer the case.

Rex-Cut's new Aluminator T27 cotton fiber grinding wheel grinds aluminum without any clogging or loading. Cotton fiber wheels naturally break down as heat is generated, resulting in constant sharp grit being exposed to the aluminum workpiece. "This eliminates loading, costly downtime, and the need and expense for wax or grinding aids," said a company spokesperson. The Aluminator offers increased grinding action, greatly improved surface finishing, smooth operator control and long life. "With less noise, less vibration and safer operating conditions, the Aluminator T27 cotton fiber grinding wheel is assured to make your Aluminum grinding experience smooth," said the spokesperson.

"One complaint we hear from fabricators working with aluminum is the need to take extra time to thoroughly clean lubricant residue from work surfaces after grinding. This happens from either grinding aids added to structure of the abrasive product, or waxes used in conjunction with grinding wheels," said Jon Blake, R&D Manager. "When we designed this wheel, we kept in mind the need for an aluminum grinding wheel that will grind fast and consistent while being 100% lubricant free. This allows fabricators to grind and move on to the next step without stopping to clean their workpiece."

The Aluminator is available in 4.5", 5" and 7" diameters, in 36 grit.

For more information contact:
Rex-Cut Abrasives
960 Airport Rd.
Fall River, MA 02720
800-225-8182
508-678-1985
info@rexcut.com
www.rexcut.com

Multi-Process Grinder

UNITED GRINDING's MÄGERLE MFP 51 multi-purpose grinder designed to combine grinding with conventional machining operations within one production system. This flexible machine comes equipped with either 5 or 6 axes for grinding, milling and drilling operations processing parts in single clampings for improved accuracy and output.

In its standard configuration, the MÄGERLE MFP 51 includes a high-precision 12,000 RPM spindle and an integrated 66-position tool changer for efficient machining of multiple

workpieces without the need for complete tooling changes. The machine's coolant nozzle features 2-axis control for full freedom of movement

and precise positioning of coolant delivery to the tool and/or workpiece. Through-the-spindle coolant delivery, along with nozzles on the grinding support, optimize coolant delivery. An optional nozzle changer allows for further adaptation of the coolant supply delivery to individual jobs.

An overhead grinding wheel dresser on the MÄGERLE MFP 51 is integrated into the machine's grinding support to shorten process times. Options include an RFID-based identification system for grinding wheels and tools to eliminate errors when entering tool data in the machine.


For more information contact:
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North America Inc.
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info@grinding.com
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Reduction of CO₂ Emissions

Continued from Page 50

Gehring developed a surface finishing process for ICE's which does not target a cylindrical bore shape. The bore shape is based on the distortions of the geometry under operating conditions of the engine. Through the means of form honing the reverse shape will be produced so that in running conditions, a cylindrical shape exists. The deformation in the operating condition depends on static assembly distortions and thermal cylinder distortions.

This technology can be subdivided into two process variations, form hon-

ing light and form honing professional. Form honing light simulates thermal distortion by creating different tapered shapes. The thermal expansion due to the higher taper in the top dead center leads to a cylinder bore which has to be honed to a smaller size at the top and a larger size at the bottom. Thus, the piston skirt has less contact with the bore. This results in significantly less friction.

The conical shape is generated by feedback controlled stroke displacement with higher stock removal in the lower bore section due to increased contact time of the abrasives.



The dynamic electro-mechanical feeding changes the radial expansion position of the honing stones during the stroke movement according to the form and improves herewith the previous conical shape.

These process components assure the reliable process of round non-cylindrical tapered bores within the known cycle times. Form honing has been already integrated globally into mass production scenarios. Application of form honing light technology has shown that significant improvements in emissions reductions are possible.

Form honing professional not only optimizes the local piston clearance, but also compensates for cylinder deviations from static and thermal distortions. That means that in running conditions round and straight bores can be achieved. Ring tension is reduced which results in adaptive friction and CO₂ reductions.

The non-cylindrical shape deviations can be defined through CAE assessments or torque plate bracing and tempering. In order to be able to implement form honing professional, innovative processing hardware like special honing tools with independent actuated abrasives, a piezo feeding system, a shape adaptive control and a spring-loaded finish honing tool, is necessary.

The shape data for the cylindrical deviations will be converted for every single cylinder of the engine using the form honing control. This dynamic process interaction between the feeding system, shape and the form honing tooling creates an optimal result.

Form honing professional has been implemented by customers for small production batch scenarios. The process produces cylinder deviations and surface finish profiles with high reproducibility and economical processing times. The process delivers free shapes and surface profiles with high reproducibility to conditions that still conform to cycle times.

"The advantages of form honing have been recognized by engine manufacturers and have been implemented in numerous production lines on Gehring honing machines worldwide," said a company spokesperson.

For more information contact:
Gehring L.P.
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Farmington Hills, MI 48335
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Ceramic Oxide Co-Cool Flap Discs

PFERD has introduced the POLIVLIES ceramic oxide CO-COOL flap disc, the newest addition to its line of POLIVLIES non-woven products. Premium CO-COOL abrasive material is designed to provide consistently high grinding performance, with special top-sizing for reduced loading and cooler grinding on poor heat-conducting materials. The innovative interleaved flap construction alternates

service life. Featuring high flexibility, they create a consistently high surface quality. They are compatible with angle grinders, including cordless angle grinders.

POLIVLIES CO-COOL discs are available in 4.5" and 5" diameters, in both plain arbor hole and threaded hub configurations with a maximum speed of 13,300 RPM. They are available in coarse-100, medium-180 and fine-240 grit sizes. It is recommended that the discs be used at a peripheral speed of 6,000-6,900 SFPM.

PFERD also provides POLIVLIES flap discs with Aluminum oxide A abrasive. These discs excel at universal grinding primarily in industry and the professional trades.

They also come in coarse, medium and fine grades with a recommended peripheral speed of 6,000 SFPM – 6,900 SFPM.

For more information contact:
PFERD INC.
9201 W. Heather Ave.
Milwaukee, WI 53224
262-255-3200
800-342-9015
sales@pferdusa.com
www.pferdusa.com



between aggressive coated abrasive and non-woven material, allowing for grinding followed by surface conditioning in a single operation.

These discs are recommended for work on large surfaces made from stainless steel (INOX) but can be used on nearly all materials and deliver increased economic efficiency due to high abrasive performance and long

CPX Linear Blank

Continued from Page 50

- Polymer base (ANCAcrete) has enhanced thermal stability and vibration dampening properties, delivering grind-process stability.
- LinX linear motors achieve enhanced precision and performance.
- BlankX software provides ease of use and programming flexibility.
- ANCA motion machine control system—AMC5 CNC and AMD5X servo drives provide all the computing power needed for sub-micron motion control for high accuracy.
- ANCA Motions AR300 low cost robot loader for automated loading of tool blanks is an option.
- Quick set-up times.

Powered by LinX

ANCA's LinX linear motor technology for axis motion (X, Y and V axes), in conjunction with linear scales, is designed to achieve enhanced precision and performance. Specially designed for a lifetime of operation in harsh grinding environments, the LinX motors have a cylindrical magnetic field which means there is no additional down force on the rails or machine base.

With no temperature variations (meaning no need for a separate chiller unit), and being sealed to IP67, there is minimal wear and tear so that the machine accuracy remains over the lifetime of the machine. The LinX linear motor has higher axis speed and acceleration, leading to reduced cycle times while

maintaining a smoother axis motion.

CPX Linear Capabilities

- With a peak power of 43 kW (58 HP) the grinding spindle for roughing uses a 250 mm (10") diameter wheel, ensuring high volume stock removal in the shortest possible cycle time. This high-powered spindle removes the need for removing material in multiple passes which means shorter cycle times and higher productivity.
- Finishing spindle uses a 150 mm (6") diameter wheel supplying a peak power of 9.7 kW (13 HP) for optimal finish grinding operations.
- Large working envelope with an overall blank length of 360 mm (14.1") and a maximum diameter of 25 mm (1") when manual loading.

For more information contact:

ANCA Inc.
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Wixom, MI 48393
248-926-4466
usainfo@anca.com
www.anca.com

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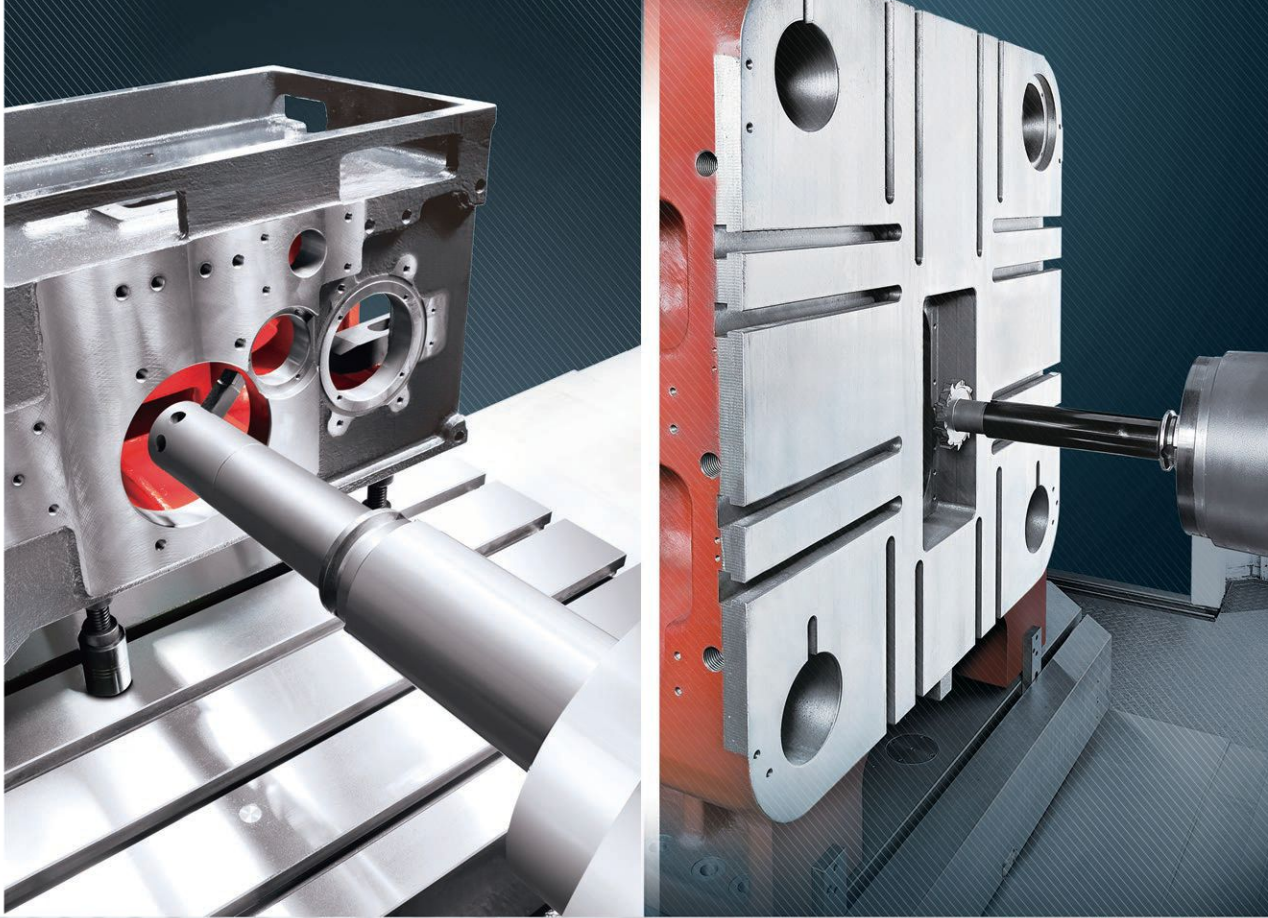


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BL series

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IMPCO Services Support Customer Component Development

The R&D facility at IMPCO maintains several flexible microfinishing machines capable of processing many different customer shaft-type parts and lengths. The company uses these machines to develop a repeatable process across all parts and to document 'pre' and 'post' process part conditions to demonstrate the improvement achieved with its microfinishing process. A flexible approach to processing a wide variation of components using some unique tooling solutions enables IMPCO to generate microfinishing solutions that obtain a consistent surface finish on a wide range of components.

"IMPCO has years of experience in delivering cost-effective and reliable solutions for a wide variety of clients," said a company spokesperson. "These include Formula 1 race teams who trust IMPCO with high performance tolerance requirements as well as the majority of major engine manufacturers, gas or diesel, large or small."

The IMPCO R&D lab efforts have resulted in:

- Optimized surface topography – reduced friction on running surfaces
- Optimized component geometry – reduced high and low frequency surface chatter
- Reduced 'Oil Film' thickness – allowing reduced running clearance
- Reduced friction on highly loaded critical surfaces – improving engine

power output

- Reduced friction – allowing a reduction on CO₂ emission
- Removal of ferrite caps in nodular iron crankshafts – increasing bearing life
- Reduction of edge loading on bearings – through process optimization.

In addition to its process development capabilities, IMPCO can perform production microfinishing for prototype builds, production spills requiring repair finishing or small batches that do not justify purchasing in-house capability.

Through its collaboration with its customers, IMPCO can specify the appropriate machine solution for a large number of situations including:

- High volume, high performance solution for components up to 0.8 m in length
- Low volume, high performance solutions up to 0.8 m in length
- Low volume, high performance heavy-duty solution up to 4 m in length
- Flexible microfinishing solutions for low production with a high variation in product variation.

"At IMPCO we are able to support our customers with product development, through process optimization for their microfinishing requirements from prototype parts to full production runs," said Mark Hendel, IMPCO Global Sales Director. "Our close partnerships with

OEM research facilities ensures we are able to develop a process that meets their needs. The knowledge gained and developed through our in-house research and development process is transferable into a production environment.

"By working closely with our customers, we are able to identify problems and determine root-cause strategies on failed components. With this information, we then apply our understanding to develop a production solution that creates a superior surface finish topography to the component. All this is done while providing support through product testing to ensure we have produced a solution capable of withstanding the rigors of testing as outlined by our customer, Hendel continued."

IMPCO also offers a subcontract microfinishing services for a variety of part types, sizes and features.

"Within the subcontract department, IMPCO generates MLP [Make Like Production] solutions that permit customers to obtain a consistent surface finish on a wide range of components. IMPCO has the capacity to process a batch of 1 through to production runs in excess of 50,000 parts," said the spokesperson.

For more information contact:
IMPCO
3417 West St. Joseph Street
Lansing, MI 48917
517-484-9411
sales@impco.com
www.impco.com

Surface Grinder for Toolrooms

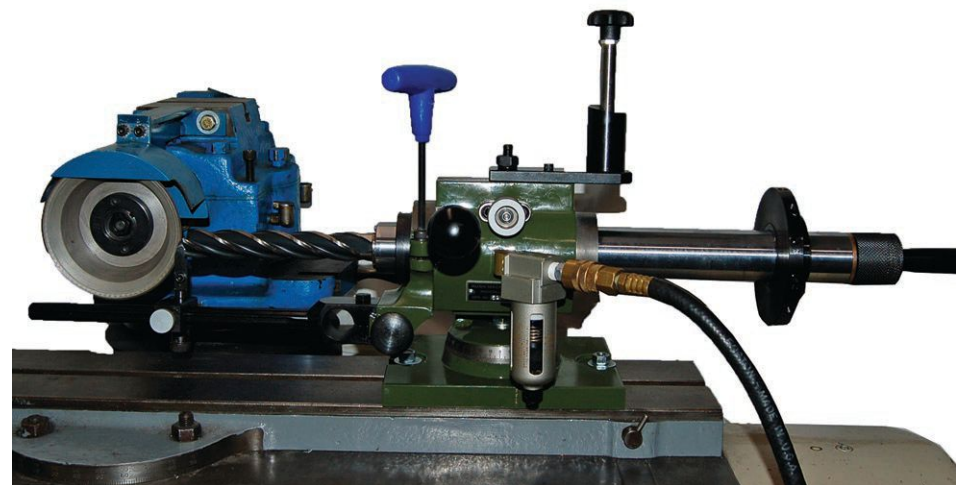
"The 8 in. x 18 in. Surface Grinder from Palmgren is an indispensable metalworking machine for toolrooms," said a company spokesperson.

This fully flexible surface grinder is designed to be quiet, efficient, making it a suitable choice for grinding soft to hardened or annealed ferrous metals. Its cast iron construction minimizes vibration while maximizing rigidity and accuracy.

For more information contact:
Palmgren – a C.H. Hanson Brand
2000 N. Aurora Road
Naperville, IL 60563
800-827-3398
sales@chhanson.com
www.palmgren.com



Air Bearing End Mill Grinding Fixtures



Rush Machinery offers a series of air bearing end mill grinding fixtures that allow precision sharpening of end mills, reamers, shell mills and other cutters. "The spindle floats almost frictionless on a thin film of air, resulting in a smooth, even grind," said a company spokesperson. The fixture quickly mounts on Rush drill and tool grinders, and is also available with a universal base to mount on most tool and cutter or surface grinders.

The units feature a hard chrome plated and ground spindle with a 10" stroke. Tools are held by 5-C or 5-ST collets or extension bushings for up to 2" (50 mm) diameter shanks. The fixtures

allow for grinding the O.D. of any number of flutes and include a 12-position index plate for end grinding (other index plates are available). The micrometer infeed is graduated in .001" (.04 mm) of diameter. Use of the fixture allows the operator to customize end mill geometry for optimum performance.

For more information contact:
Rob Robbins, Sales Manager
Rush Machinery, Inc.
4761 Route 364
Rushville, NY 14544
800-929-3070 / 585-554-3070
rob@rushmachinery.com
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New Machines Debut at Matsuura USA Open House

Matsuura Machinery USA Inc. recently hosted an open house at its St. Paul, MN, facility. This year's theme for the event, **IMAGINE.CREATE.INNOVATE.** is what inspires Katsutoshi Matsuura, President, Matsuura Corporation. "My grandfather imagined what Matsuura could become. My father created it and I have innovated it."

At the event, Matsuura debuted the company's latest machines, the MAM72-70V, a high speed, large capacity 5-axis vertical machining center (VMC) and the MX-850 PC4, an automated version of the large capacity 5-axis VMC.

"The MAM72-70V is designed to handle a greater workpiece size than Matsuura's existing models, offers faster response times to the market and delivers productivity to meet customers' business requirements for faster cycle times and cost down performance," said David Hudson, Matsuura Machinery USA Vice President of Sales and Marketing.

The MAM72-70V features a maximum workpiece of 700 mm D x 500 mm H with a load capacity of 500 kg per pallet: an 11% increase in diameter/height; 43% increase in weight; and 38% increase in envelope volume as compared to the MAM72-63V. It also



Matsuura Machinery USA featured several new machines at the open house event including the MX-850 PC4.

includes a newly developed 4th / 5th axis table equipped with a roller gear drive for the 4th axis and direct drive motor for the 5th axis. These enhancements achieve a rapid traverse rate of 50 RPM and 100 RPM respectively, enabling high speed, high accuracy and durability in extended performance over the lifetime of the machine.

The MAM72-70V is IoT ready, delivering measurable remote and real-time monitoring of the machine status, condition and performance.

Matsuura USA also introduced the

MX-850 PC4, an automated version of the large capacity 5-axis VMC. "With cost pressures on all manufacturers, the need for reliable automated machining is increasing globally in both established and emerging markets," Hudson added.

Outfitted with 90 tools and a load capacity per pallet of 500 kg, the MX-850 PC4 has a standard installed Universal Robot Interface to maximize the automation potential.

"The MX-850 is designed to bring raw cutting power and Matsuura 5-axis high speed finesse to within reach

of every company. From aluminum to hard to cut materials, the MX-850 manages sizable and multifaceted machining tasks. It is compactly built, yet ensures high rigidity and a sufficient machining area and workability," said a company spokesperson.

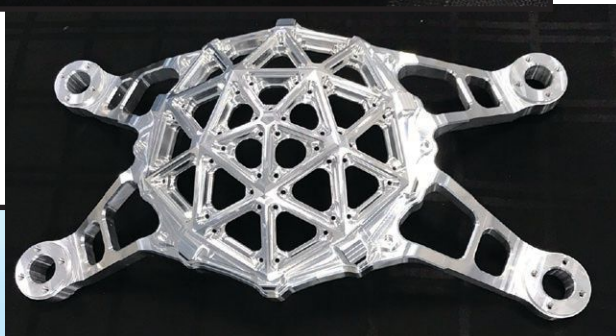
The MX-850 is equipped with Matsuura's operating system optimizing performance, automation and spindle utilization. The operating system permits direct, instinctive control as well as Matsuura Intelligent Meister System (MIMS) and Matsuura's proprietary Intelligent Protection System for the prevention of collisions.

"At Matsuura, we have developed machining centers with large pallet pools to achieve lights-out manufacturing with size ranges never before available in the Matsuura family of 5-axis machining centers," said Hudson. "Matsuura's automated pallet pool machining solutions achieve more production, offering higher levels of spindle optimization and machine utilization."

For more information contact:
Matsuura Machinery USA
325 Randolph Ave., Ste. 100
St. Paul, MN 55102
800-518-4584 / 651-289-9700
info@matsuurausa.com
www.matsuurausa.com



The name tag (above) and part (right) were created using the LUMEX Avance-25 metal laser sintering hybrid milling machine.



(l-r) Tyler Bonde, Product Manager – Northeast, Matsuura Machinery USA; and Fernando R. Garcia, Western Regional Sales Manager, Matsuura Machinery USA; with the LF-160 - a linear motor machine for high-speed and high-precision machining of smaller workpieces.



(l-r) R. J. Reed, Midwest Regional Sales Manager, Matsuura Machinery USA; and Matt Gartner, Applications Engineer, Yamazen Inc.; with the new Matsuura MAM72-70V.



Katsutoshi Matsuura, President, Matsuura Machinery USA with the new MX-850 PC4, an automated version of the large capacity 5-axis vertical machining center featuring 90 tools and a load capacity per pallet of 500kg.

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Newly Expanded Training Center for Machine Safety Training

Rockford Systems, LLC. has celebrated the opening of its multi-purpose training center located within the company's new headquarters in Rockford, IL. Launched in response to growing demand for the company's machine safeguarding seminars, the new space will support education and training for safety professionals, plant managers and machine operators.

The new training center measures 2,200 sq. ft. - more than doubling the footprint of the previous center - and provides room to accommodate everything from a 60-person classroom style event to one-on-one intensive training.

"A state-of-the-art multimedia projection system has been added, along with a new sound system, task lighting and customer-dedicated spaces, all to designed create the ideal environment to deliver the best training experience," said a company spokesperson.

The newly expanded training center will support Rockford Systems' existing machine safeguarding seminar curriculum, which includes hands-on demonstrations on 18 fully-safeguarded machines under power along with OSHA-10 and OSHA-30 General Industry. It also enables the company to add a new class not previously offered: NFPA

70E, the industry standard for electrical safety in the workplace. NFPA 70E helps companies and employees avoid workplace injuries and fatalities due to shock, electrocution, arc flash and arc blast. The first NFPA 70E class is scheduled for August 16, 2019.

"Through our new training center, Rockford Systems is expanding instruction opportunities and paving a path for a safer, more productive U.S. industrial workforce," said Carrie Halle, Vice President of Marketing and Business Development, Rockford Systems, LLC. "Rockford Systems remains at the forefront of industrial safety with innova-

tive, proven and affordable options in both our training and more than 10,000 safeguarding products. The decision to expand training was a logical step in our business growth strategy."

Serving seminar attendees drawn from across the country, the training center is near Rockford and O'Hare International airports, which affords easy travel access and convenient hotel accommodations.

For more information contact:
Rockford Systems, LLC
5795 Logistics Parkway
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Seco Tools Adds Director of Customer Experience



Bill Barcelona

Seco Tools has named Bill Barcelona as Director of Customer Experience. In this new role, Barcelona and his team will address rapidly evolving customer needs to enhance sales and service responsive-

ness further throughout the company.

At Seco, Barcelona's responsibilities will include automating and streamlining processes and procedures to provide all customers with the most up-to-date, comprehensive data about their interactions with the company. He will promote effectiveness in foreseeing customer needs and focus on providing ease of use throughout distributor and end-user relationships with the company.

"I am delighted to welcome Bill to my management team and look forward to his impact on our customer-facing efforts and plans," said Rob Keenan, President of Seco Tools, LLC. "He will be instrumental in our continued emphasis on forging enduring relationships with our customers."

Continued on Page 64

Starrett Appoints Director of Sales



Jon-Michael Raymond

The L.S. Starrett Company has appointed Jon-Michael Raymond as Director of Sales, North America, Industrial Products. Raymond will be responsible for sales of the company's core products

including precision measuring tools and gauges, hand tools and saw blades in North America. He succeeds Tony Aspin, Vice President of Sales, who will be retiring on June 30th, after having served the company for 28 years, 18 of them as Vice President of Sales. Aspin and Raymond will be working together on a transition plan until the end of June.

"Jon-Michael brings a strong sales and marketing background as well as experience with distribution and end users, and will be instrumental in growing the sales of our broad range of products in North America," said Douglas A. Starrett, President and CEO of Starrett. "We welcome him to the Starrett team and wish Tony Aspin the best in his retirement."

Continued on Page 64

Jingdiao North America Announces New Midwest Regional Sales Manager



P.J. Naughton

Jingdiao North America, a manufacturer of ultra-precision, high-speed machining centers has appointed P.J. Naughton as its new Midwest Regional Sales Manager. Based in the Jingdiao's North American Mt. Prospect, IL, headquarters, Naughton will be responsible for supporting customers and dealers in

the Midwest region.

Naughton has over 30 years of machine tool experience. "He has always been associated with high precision machine tool related companies and his experience will match well with Jingdiao's line of high-quality machining solutions," said a Jingdiao spokesperson. He has a wide array of experience including applications, marketing and sales. "This is perhaps the most exciting time of my life to work with a high-quality manufacturer like Jingdiao whose machines can produce parts that were once thought of as impossible," said Naughton.

For more information contact:
Jingdiao North America Inc.
1400 E. Business Center Dr.
Mt. Prospect, IL 60056
847-906-8888
info@jingdiao.com
www.jingdiaousa.com

Kitagawa-NorthTech Announces Changes and Promotions



Shawn Luschei

Kitagawa-NorthTech, Inc. has announced some changes to its sales organization, realigning its inside and outside sales teams for the company. "The recent reorganization with the sales teams was done to improve operational efficiency and to better serve its valued North American customers," said a company spokesperson. The following announcements and promotions were made reflecting these changes.

Shawn Luschei is promoted to Vice President of Sales and Marketing. Luschei worked for the company for 17 years from 1994 to 2011, and then rejoined the company in 2017 as senior sales manager. In this leadership role,



Dale Anderson

Luschei will manage and direct inside and outside sales teams, as well as the company's Productivity Team (P) and Customer Service group. The "P" Team is Kitagawa-NorthTech's in-house group of engineers and project managers who are responsible for designing, engineering and manufacturing custom workholding solutions for part specific machining projects.

Dale Anderson is promoted to Inside Sales Manager. In his new role, Anderson will have direct responsibility for leading the Inside Sales and Customer service teams for Kitagawa-NorthTech. Like Luschei, Anderson also previously worked for Kitagawa-NorthTech for nine years before returning to the company in 2018. Throughout his career, Anderson has served the company in many roles and capacities including inside sales, regional sales manager, project management and engineering management. He will report to Luschei, VP of Sales and Marketing. Luschei said, "Dale is a workholding, machining and chuck expert. He is extremely technical and versed in workholding technology which makes him excellent at providing customers solutions that address and solve their workholding requirements. In addition, with

Continued on Page 64

Verisurf Appoints Reseller Channel Sales Manager



Scott Knoche

Verisurf Software, Inc. has appointed Scott Knoche as Reseller Channel Sales Manager for the U.S. and Canada. Under the new position, Knoche will lead efforts to support Verisurf resellers with a multifaceted metrology sales and marketing support program.

The effort is aimed at helping authorized dealers be successful identifying customers, developing needs assessments and delivering comprehensive metrology solutions in support of today's advanced manufacturing requirements.

"Scott has been a part of sales and marketing at Verisurf for the past 16 years, most recently serving as North Central Regional Sales Manager, and brings a wealth of experience to this new position. His reputation precedes him with resellers and customers alike, and we look forward to his contributions to this important channel management responsibility," said Ernie Husted, President and CEO of Verisurf. Regional Managers, Sales and Applications Engineers, and headquarters staff will continue to provide resellers with sales and administrative

Continued on Page 64



Ryosuke Yatsunami



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Verisurf Appoints Reseller Channel Sales Manager

Continued from Page 62
support along with added program support, under Scott's direction.

"We are taking a program approach to dealer success, designed to help principals and their sales teams effectively recognize opportunities, provide consultation and make recommendations on automated quality inspection and reporting, scanning and reverse engineering, and tool building," said Knoche.

The 5-point reseller success pro-

gram provides critical support and education for each of the metrology applications, in the following areas: training; sales and marketing materials; customer demonstration; online dealer portal; and technical support.

For more information contact:
Verisurf Software, Inc.
4907 E. Landon Dr.
Anaheim, CA 92807
888-713-7201 / 714-970-1683
info@verisurf.com
www.verisurf.com

Kitagawa-NorthTech Announces Changes and Promotions

Continued from Page 62
his extensive knowledge of workholding and chucks, he will help mentor our inside sales team and staff."

Previously serving as inside sales manager for the company, Ryosuke Yatsunami has been promoted to Business Development Manager. In this new position, Yatsunami will operate in a few different management and sales capacities. He will focus on supporting KNI's strategic growth initiatives including, rotary table new product launches, key accounts man-

agement, while maintaining relationships with strategic vendors in Japan. Ryosuke will also be responsible for developing and supporting sales for Kitagawa-NorthTech's New Mexico operation.

For more information contact:
Kitagawa-NorthTech, Inc.
301 E. Commerce Drive
Schaumburg, IL 60173
800-222-4138
info@kitagawa.us
www.kitagawa.us

Seco Tools Adds Director of Customer Experience

Continued from Page 62
With a background in capital markets and technology, Barcelona joins Seco from Kasasa, Ltd., a Texas-based financial technology and marketing services company, where he served as senior vice president, client success and strategy. In that role, he developed a client success team that enhanced customer service and support, yielding significant sales growth by enabling customers to take full advantage of the company's products and services.

"I relish the opportunity to help make the Seco name synonymous with the highest quality of customer sup-

port and success as defined by our channel partners and end users," Barcelona said.

Barcelona holds a bachelor's degree in management information systems from the University of Dayton and is pursuing an MBA at the University of Michigan.

For more information contact:
Seco Tools LLC
2805 Bellingham Drive
Troy, MI 48083
248-528-5200
secotools.us@secotools.com
www.secotools.com/us

Starrett Appoints Director of Sales

Continued from Page 62
Raymond has worked in the industrial marketplace for over 12 years, with the past three years serving as VP of sales for PFERD Inc. He has also held various sales and finance positions for Osborn and Norton | Saint-Gobain Abrasives. Raymond is a graduate of Worcester State University and Assumption College, where he received a Master's of Business Admin-

istration. He will be based out of Starrett corporate headquarters in Athol, MA.

For more information contact:
The L. S. Starrett Company
121 Crescent St.
Athol, MA 01331
888-674-7443 / 978-249-3551
general@starrett.com
www.starrett.com

Eriez Promotes Sales Personnel

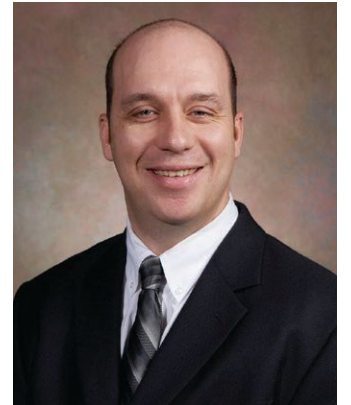


Jeff Kaveney

Senior Sales Director, Dave Heubel said that Eriez has promoted Jeff Kaveney to Director of Sales and Product Management and Dave Heubel to Director of Heavy Industry.

Kaveney, who has been with Eriez for 24 years, served as manager of product marketing and administration prior to this promotion.

Heubel said, "Jeff's responsibilities include providing leadership for our separation, vibratory, metal detection and recycling product lines, developing key sales strategies for our light industry markets and overseeing order administration. Jeff's proven dedication, wealth of product knowledge and widespread application experiences make him uniquely qualified to guide Eriez-USA in meeting our continually evolving strategic goals for product



Darrell Milton

standardization and organic product development."

Kaveney earned a bachelor's degree in business management from Gannon University in 1984. He joined the Eriez sales team in 1995 as a technical sales representative. During his tenure with Eriez, Kaveney has completed numerous training programs and authored an extensive array of technical articles which have appeared in national trade publications.

Milton has been an Eriez employee for nearly three decades, serving most recently as metalworking filtration systems manager.

In his role, Milton's responsibilities will include developing key sales strategies, tactics and action plans to expand Eriez' metalworking, heavy industry and recycling market sales. He will also

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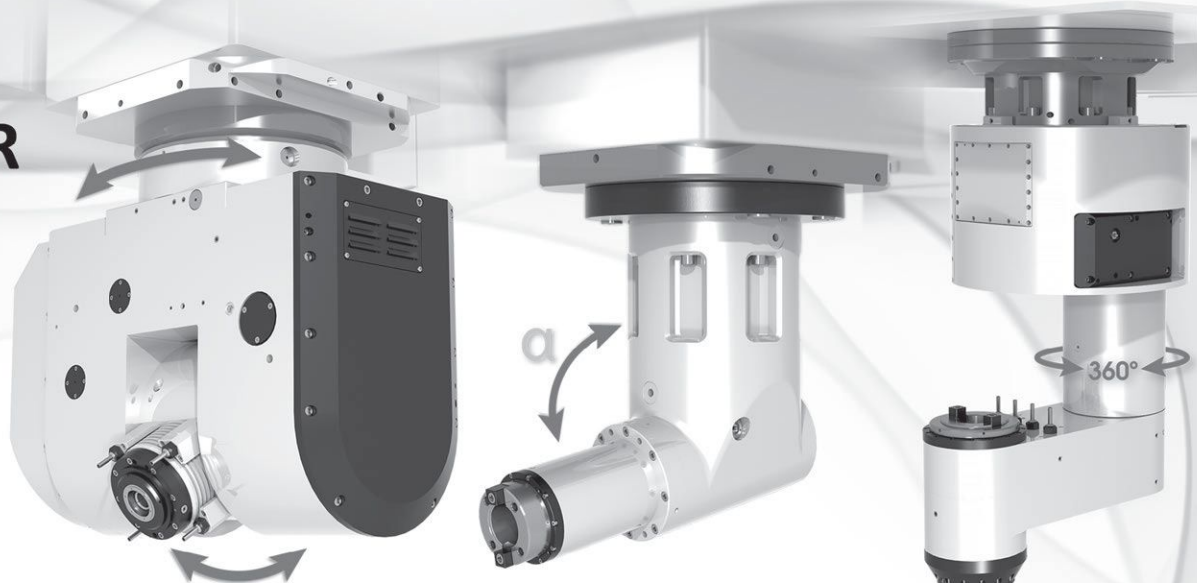
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oversee the performance of Eriez-USA's metalworking representative network in the U.S. and Canada. Heubel said, "With his unwavering dedication and demonstrated ability to lead teams to success, Darrell is well-prepared to take on the challenges of his new position."

Milton joined Eriez in 1991 as part of the company's Canadian sales staff, rising to the position of Canadian national sales manager in 1995. Milton relocated in 2006 to Erie, PA, to serve

from the company's corporate headquarters. He was promoted to recycling market manager in 2011 before his promotion to metalworking filtration systems manager in 2013.

For more information contact:
Eriez Manufacturing Co.
2200 Asbury Road
Erie, PA 16506
800-345-4946 / 814-835-6000
eriez@eriez.com
www.eriez.com

AIDA-America Hires Director of Operations



Bob Adkins

Bob Adkins has been promoted to Director of Operations. He joined AIDA-America in March of 2013 and most re-

cently served as purchasing manager.

In his new role, Adkins will be responsible for overall production promotions operations, which encompasses planning, purchasing, manufacturing, logistics and facilities management.

AIDA is a provider of design, manufacture, sale, service and support, refurbishment and modernization of metal stamping presses and metal-forming automation equipment.

For more information contact:
AIDA-America Corporation
7660 Center Point 70 Blvd.
Dayton, OH 45424-6380
937-237-2382
info@aida-america.com
www.aida-america.com

Cleaning Technologies Group Hires Chemical Sales Manager

Jared Moore has joined Cleaning Technologies Group, LLC as a Chemical Sales Manager.

"Jared comes to us with a strong chemistry background and has the ambition and drive that our growing organization desires but also the superb customer service skills that our customers demand," said Jeff Mills, VP of Ransohoff Sales.

Moore is an experienced sales executive with a background in chemical sales. He has worked in surface finishing for over two decades – working closely with clients to overcome the challenges of cleaning both metallic and non-metallic surfaces. Moore holds a chemistry degree from Miami University as well as Certified Electroplater-Finisher certification from the NASF.



Jared Moore

For more information contact:
Cleaning Technologies Group, LLC
4933 Provident Drive
Cincinnati, OH 45246
877-933-8278 / 513-870-0100
www.ctgclean.com

Quality Assurance Manager Joins Forest City Gear



Bob McClain

Forest City Gear has hired Bob McClain as Quality Assurance Manager to oversee the activities of the company's Quality Lab and manage all its company-wide quality systems for aerospace, medical and other precision

gearing applications.

"Bob brings a wealth of quality program management experience and a deep familiarity with precision parts manufacturing for the aerospace, military, automation and other industrial markets. He will be instrumental in ensuring that Forest City Gear has the infrastructure, systems and supplier network in place to meet the very highest quality standards increasingly common to the precision gear projects for which the company is renowned," said Forest City Gear President and CEO Wendy Young.

For more information contact:
Forest City Gear
11715 Main Street
Roscoe, IL 61073
info@forestcitygear.com
www.forestcitygear.com

Qualtek Manufacturing CEO Elected PMA Board Chairman

The Precision Metalforming Association (PMA) elected Troy Roberts, CEO of Colorado Springs, Qualtek Manufacturing, as the 2019 chairman of the PMA Board of Directors during PMA's recent annual meeting. Joining Roberts with a leadership role on the board is Troy Turnbull, President of Industrial Innovations, Inc. in Grandville, MI, who will serve as first Vice Chairman and Treasurer.

Roberts, who will serve a one-year term, succeeds outgoing PMA Board Chair Dave Arndt, President and CEO of Pentaflex, Inc.

"I am honored to be elected board chairman and thank Dave Arndt for his outstanding leadership and accomplishments during his term as chair," said Roberts.

Roberts said that as chair he will focus on workforce development, and specifically better defining PMA's role in this challenging landscape so that the association's array of services and advocacy efforts can better address this growing challenge.

"PMA's new online learning management system, METALFORM EDU, allows the association to play a practical role in helping our members train their workers," said Roberts. "I am excited about this new online platform and I am speaking from experience: We are training our employees at Qualtek Manufacturing using METALFORM

EDU's online courses and we have had great success."

"A related challenge for our member companies is changes in the automotive industry," continued Roberts. "For many of our member companies, automotive is king. Yet, consumer tastes (SUV vs. cars) and generational shifts (car-sharing, autonomous driving and electrification, for example) will impact OEM sales, production volumes and the manufacture of component parts. This paradigm shift will present significant challenges and opportunities for our association members and to the entire metal forming industry. PMA must lead in providing the industry with information to help it understand and navigate these issues."

"Moving forward, PMA membership, as represented by PMA's board of directors, and PMA staff under new President David Klotz's leadership, must define and create the roles it seeks to play in these important issues, effectively communicate these options to our membership and then develop and implement a strategic plan that reflects the direction selected by membership."

For more information contact:
Precision Metalforming Association
6363 Oak Tree Blvd
Independence, OH 44131
216-901-8800
www.pma.org

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AEC Announces New Board Members in Annual Election

The Aluminum Extruders Council (AEC) has announced the results of the annual election of officers and directors at the recent 70th Annual Meeting & Leadership Conference.

R. Scott Kelley, President and CEO of Service Center Metals in Prince George, VA, was re-elected to serve as Chairman of the Aluminum Extruders Council. Brook Massey, President of MI Metals in Oldsmar, FL, was re-elected to serve as Vice Chairman. Matt McMahon, President of Pries Corporation in Independence, IA, was re-elected to serve as Immediate Past Chairman. And, Jeff Henderson was re-elected to the nonvoting position as President of the Council.

In addition, three new members of the Board of Directors were elected. Mark Butterfield, Managing Director for Magnode, A Shape Corp. Company in Trenton, OH, was elected as an At-large Member of the Executive Committee. Butterfield is an active member of AEC, serving on numerous committees and teams, including acting as Chair for the Automotive Industry Promotion Team,

Vice Chair of the Die and Tooling Team, a Track Chair for the ET Seminar Committee and a member of the Industry Promotion Steering Committee and Academic Engagement Team. In addition, he has been a presenter and moderator at a variety of AEC educational events, including the recent Process Optimization Workshop and the upcoming Extrusion Design University 2019.

Bennett McEvoy, Vice President of Sales and Marketing for Western Extrusions Corp. in Carrollton, TX, was elected to a three-year term as Extruder Director. "McEvoy is a passionate supporter of the Aluminum Extrusion Fair Trade activities," said a company spokesperson.

Tom Horter, President of Matalco, Inc. in Bluffton, IN, was elected to a two-year term as Supplier Director.

For more information contact:
Aluminum Extruders Council
1000 N. Rand Rd., Ste. 214
Wauconda, IL 60084
847-526-2010
mail@aec.org
www.aec.org

LSI Industries Hires VP Strategic Initiatives

LSI Industries, Inc. has appointed Nelson Wesley as Vice President Strategic Initiatives. Nelson will oversee initiatives focused on improving sales, driving operational efficiency and ultimately improving financial performance of the company. As a senior level leader, he will report to the CMO, Scott Coleman.

"What I found compelling about LSI is its rich history in the industry and the team's dedication to growth through new product development and focusing on the customer," said Wesley. "It is an exciting opportunity to add value."

Wesley joins LSI Industries with over 20 years of marketing, sales and product management experience. He started his career at Ingersoll Rand and most recently he served as vice president of sales, marketing, and aftermarket, involving direct management of sales, marketing, aftermarket and bid teams at Ellis & Watts. Wesley holds two bachelor degrees, a Bachelor of Science in Civil Engineering and a Bachelor of Arts in Physical Science,



Nelson Wesley

from University of Kentucky and Asbury University, respectively.

"We are excited to find a person of this caliber and background for this new position. Nelson will be a strong asset to the team here at LSI Industries," remarked Coleman.

For more information contact:
LSI Industries Inc.
10000 Alliance Road
Cincinnati, OH 45242
513-793-3200
www.lsi-industries.com

ASSP Names New Director of Professional Development

The American Society of Safety Professionals (ASSP) has welcomed its new Director of Professional Development. Chris Ballman, PHR, MSHR, will oversee the Society's comprehensive educational offerings that advance the careers of occupational safety and health professionals worldwide. He will also provide leadership oversight of ASSP's largest annual event – a Professional Development Conference and Exhibition that attracts more than 5,000 industry professionals.

Ballman is an experienced association executive whose background includes employee and member development with a focus on facilitation, instructional design, eLearning and consulting.

"We are thrilled to have Chris on board because his experience and abilities will help strengthen ASSP's position as a global leader in professional development," said CEO Jennifer McNelly. "We know Chris can hit the ground running and make a posi-

tive impact from the start."

Prior to joining ASSP, Ballman spent six years as senior director of education and learning services at the Chicago office of SmithBucklin, an association management and services company. He led a team of specialists who helped organizations create and deliver innovative educational content.

Ballman also served as training specialist and senior career consultant for Colorado Technical University. His experience includes leading the design, implementation and evaluation of instructional programs for adult learners in online and classroom settings. He holds a master's degree in human resources from Loyola University Chicago and a bachelor's degree in history from Carthage College.

"Considering the realm of his experience, Chris brings a lens of learner-centric education that is anchored in creating a great experience," McNelly said. "He has a unique blend of skills



Chris Ballman

that have helped his association customers deliver significant value to their members."

For more information contact:
American Society of
Safety Professionals
520 N. Northwest Highway
Park Ridge, IL 60068
847-699-2929
www.assp.org

Celebrating 100 Years of the Spherical Roller Bearing

The spherical roller bearing (SRB), designed to help engineers accommodate heavy radial and axial loads in applications prone to misalignment or shaft deflections, celebrates its 100th birthday this year thanks to SKF.

"Originally developed in 1919 by an SKF engineer, Arvid Palmgren, the SRB has since made its mark worldwide," said a company spokesperson.

"Created to complement the self-aligning ball bearing, due to its ability to accommodate misalignment under heavy loads, the initial SKF design has now become part of the largest family of products in the industry," added the spokesperson.

On the fabled Las Vegas strip, the High Roller ferris wheel contains two of the largest SRBs ever produced by SKF, each weighing in at 8.8 ton. SKF spherical roller bearings can be found in many applications, including some where you might not expect them. A good example is the Bahrain World Trade Center, where three tower wind turbines, each 29 m in diameter, are architecturally installed between the two 240-m-high (50-story) towers and generate 1,300 MWh per year. The main shafts of the turbines were equipped with SKF spherical roller bearings. The turbines went online in March 2008 and are operational 50% of the time, depending on wind conditions. Another alluring application fitted with SRBs is the rebirth of the Zeppelin after 60 years of absence following the Hindenburg disaster. SKF was brought in by ZF, the gearbox manufacturer for the Zeppelin NT, to help the new and improved airships to propel forward.

SKF's extensive SRB range delivers a range of benefits for specific operating conditions. For example, operators in contaminated environments in heavy industrial applications have in-

creased their bearing rating life by up to four times with sealed SKF spherical roller bearings. Those working in the harshest of environments have benefitted from SKF's Three-Barrier Solution that delivers cost-effective, optimized rating life, minimal maintenance spherical roller bearings. "New dimension gearbox design has even become possible due to SKF Explorer SRB's long service life and high performance," said the spokesperson.

Petra Öberg Gustafsson, Product Line Manager Self Aligning Bearings at SKF said, "From the very start, SKF has taken the lead in the development of



self-aligning bearings. We introduced spherical roller bearings in 1919 and have been consistently improving them ever since. Building on Arvid Palmgren's original design, we now offer engineers the widest range of both open and sealed spherical roller bearings in the industry. With the continued push for high performance in ever more challenging environments, it will be interesting to see what the next 100 years of development generates."

For more information contact:
SKF USA Inc.
890 Forty Foot Rd.
Lansdale, PA
267-436-6000
www.skf.com

Large Machining Center, EDM and Grinders On Display at KGK Grand Opening

KGK International, an importer and distributor of Japanese machine tools throughout North America, recently celebrated the grand opening of its new headquarters in Elk Grove, IL.

On display at the event were KENT grinders and machining centers, as well as Seibu wire EDMs including the M50B. Built for medium sized parts, the M50B features a pitch cutting accuracy of ± 3 micron, a maximum workpiece size of 31.5" x 25.6" x 11.8", a maximum workpiece weight of 1,764 lbs. and a wire diameter of .004" to .012". The M50B also features the FANUC Smart NC 21.5" touch panel control which contains over 4,000 cutting conditions and can access all operations like on the screen of a smart phone. The CAM-Station option is loaded with a new CAM function, which enables a CAD file to be converted to NC code.

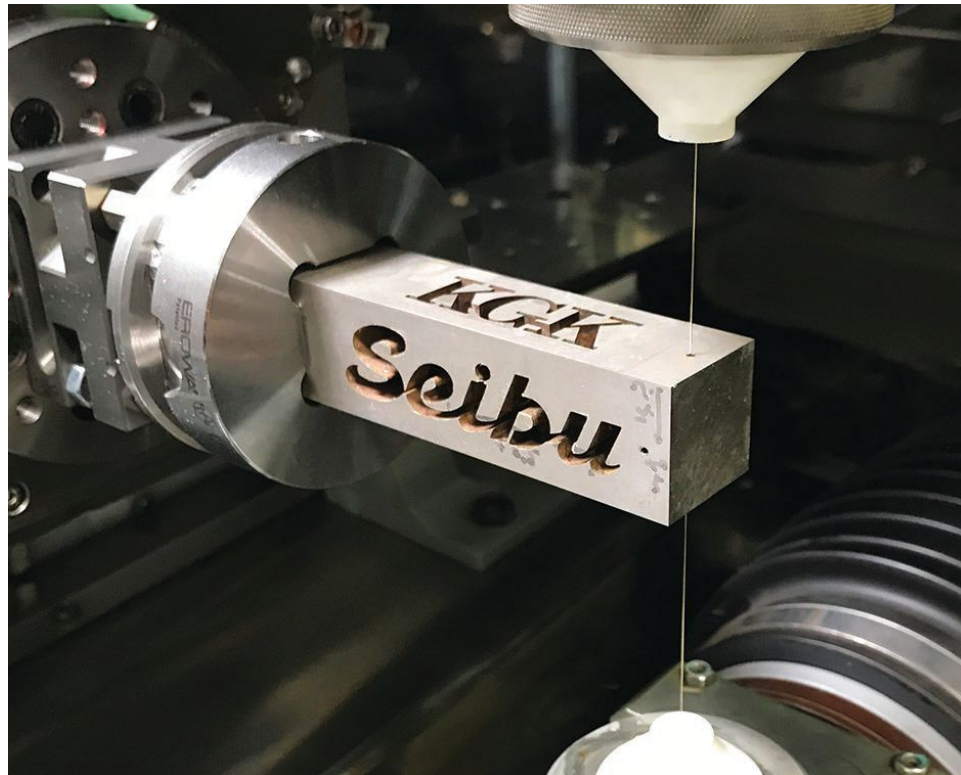
Also featured at the event was the Seibu Ultra MM50B wire EDM. Designed for even more precise cutting than its M50B counterpart, the MM50B features a pitch cutting accuracy of ± 1 micron. It has similar workpiece imen-

sions but can utilize a wire diameter from .002" to .012".

The KENT KVM-22P double column machining center was on display. It features a table size of 87" x 65", XYZ travels of 87" x 79" x 35.5", a 32-tool capacity and a 30 HP multi-speed spindle at 6,000 RPM that adopts a German-built ZF helical planetary gearbox.

Other KENT models on display were the KGS-63WM1 and KGS-250AHD surface grinders. The 63WM1 features longitudinal on V-flat scraped guideways, saddle traveling crossfeed, motorized rapid elevation, overhead hydraulic wheel dresser along with surface grinding and plunge grinding capabilities. The 618S manual surface grinder features longitudinal on ball bearing table ways, tabletop manual dresser along with surface grinding.

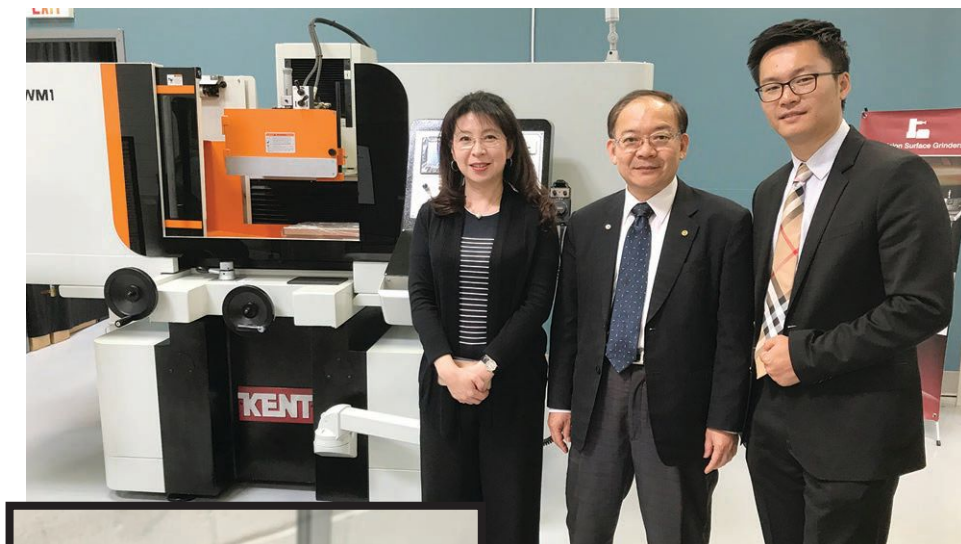
For more information contact:
 KGK International Corp
 1550 Louis Avenue
 Elk Grove Village, IL 60007
 847-621-2655
 www.kgki.com



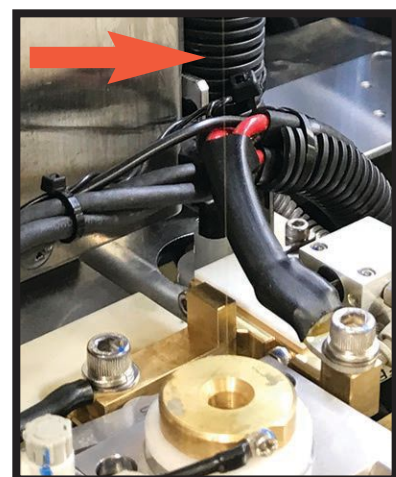
Seibu EDM machines displayed innovative machining applications during the grand opening event.



(l-r) Andrew Yee, Assistant Application Engineer, KGK International; Yuki Ito, Sales Engineer, Seibu; and Junichi Izaki, President, KGK International; with the Seibu M50B EDM machine.



(l-r) Michelle Huang, General Manager, KENT Industrial; Chin Pei Lee, President, KENT Industrial; and Max Lee, Manager of Sales Department, KENT Industrial; with the KENT KGS-63WM1 surface grinder.



(above) The wire size of the MM50B is .002". Wire location indicated by the arrow above. (right) Andrew Yee, Assistant Application Engineer, KGK International with the Seibu Ultra MM50B.



Rich Sato, Account Manager, KGK International, with the Kent KVM-22P Double Column CNC Machining Center. It features a large table size, a 32-tool capacity and a 30 HP multi-speed spindle.

Retrofit/Remanufacture/Repair

Machine Tool Service and Spare Parts



36 months warranty on MASTER spindles with unlimited spindle hours.

Comprehensive service solutions are essential for high productivity. DMG MORI offers service solutions and spare parts availability by providing:

- More than 200 service technicians in the field
- Over 350 personnel total in service and parts
- 24/7 service hotline offers full customer support
- Warranties of 24 months on machines, 24 months on controls and 36 months on MASTER spindles with unlimited spindle hours.

DMG MORI began its sixth service apprentice class with 65 past and pres-

ent technicians having been or being part of the program. With this growing service staff, DMG MORI provides emergency assistance around the clock.

DMG MORI rebuilds factory spindles at the Davis manufacturing facility in California. Spare parts stock in Dallas has a retail value of \$140 million USD.

For more information contact:
DMG MORI - Americas
Headquarters
2400 Huntington Blvd.
Hoffman Estates, IL 60192
847-593-5400
Service Hotline: 855-DMG-MORI
www.us.dmgmori.com

DRO with Touchscreen for Machining



HEIDENHAIN has announced its new POSITIP 8016 digital readout (DRO) with touchscreen for manual machine tool applications. With its sturdy machined aluminum housing, this DRO is designed to add reliability and ease-of-use to its milling, drilling, boring and turning jobs.

The PT 8016 DRO has a multitude of functions including a Taper calculator, Bolt-Hole Pattern routine and Tool Radius Compensator. This DRO also includes distance-to-go modes in both absolute and incremental. It can control of up to three NC analog, point-to-point

Continued on Page 70

ServicePlus Program

EMAG's ServicePlus provides customers with individually modifiable solutions, designed to fit their requirements. Services include Retooling, Customized Reconditioning and Retrofits.

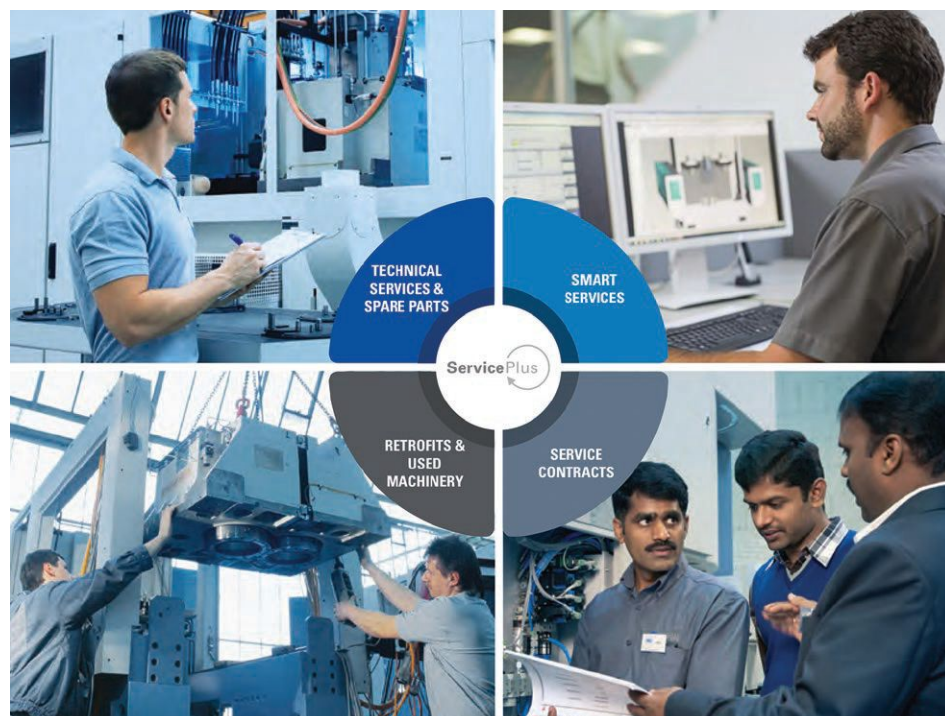
Retooling

To help customers adapt to new

production series or the production of completely new part families, EMAG can perform desired changes to existing part families and also proactively plan for new workpieces, as well as set up the equipment in preparation for these.

EMAG performs all requested

Continued on Page 70



**For more information on
Retrofit/Remanufacture/Repair
Visit www.mfgnewsweb.com**

Maximize Up Time

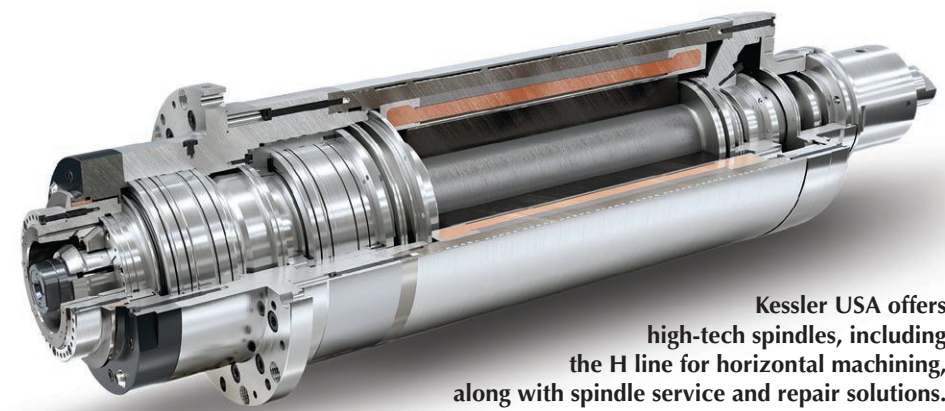
Kessler USA, supplier of high-tech spindles, directly driven 2-axis heads and rotary tilt tables, offers spindle service and repair solutions to help customers reduce their machine downtime. Strategic exchange of components, in-stock kits and training are available. "Kessler provides full support with its detailed process and fault analysis, and repair service," said a company spokesperson.

Kessler USA has nearly tripled its stock levels in the Americas, while strategically eliminating non-relevant items. "By re-evaluating what is impor-

tant to have to support the expectations of our customers, we have achieved a 100% part availability for our high volume products," said the spokesperson. Low volume products are also available via a kit or exchange strategy.

Key response times for repairs have been shortened from what took months before to 1-2 week express repairs. Kessler USA, along with Kessler Germany, directly support their authorized service partners in Canada, the U.S. and Mexico. "All partners have the latest equipment to carry out

Continued on Page 70



**Kessler USA offers
high-tech spindles, including
the H line for horizontal machining,
along with spindle service and repair solutions.**

Upgrade Control for Giddings & Lewis 8000 Units



As a FANUC Authorized Integrator, Fives and its Machine Tool Services & Solutions, has been able to bring the OEM proprietary features of the Giddings & Lewis 8000 control platform, such as axis tracking, to a FANUC retrofit. "This translates to added performance, increased applications abilities, commercially-available components, improved quality and increased productivity, all while modernizing users' Giddings & Lewis equipment," said a Fives spokesperson.

"Fives has a rich and long-standing legacy of Giddings & Lewis 8000 controls and will continue to provide technical support and service at a limited capacity," continued the spokesperson. "But due to the progression of new technology, the Giddings & Lewis 8000 control has reached the end of its life

and Fives will no longer offer any updates or enhancements for this product."

"Following the commercial announcement from Kollmorgen on March 29, 2019, regarding the closure of its support efforts for the G & L 8000 control, Fives and its Machine Tool Services & Solutions team have developed an upgrade for Giddings & Lewis 8000 units: the new FANUC 0iF Retrofit." Options for HBMs and VTCs are available.

For more information contact:
Fives Giddings & Lewis, LLC
A subsidiary of
Fives Machining Systems, Inc.
142 Doty Street
Fond du Lac, WI 54935
920-921-9400
www.fivesgroup.com

Remanufacturing Rises to Top of Machine Investment Strategies

Many manufacturers that have been in operation for decades struggle with similar questions when it comes to their older machines. Regular maintenance is a must, of course. But what about bringing equipment back to that prime efficiency and quality it had when it was new?

Rick Moscarino, Senior Product Development/Apps Specialist for Ultra Tech Machinery, gets this question at least a couple dozen times a year. Finding the right engineering group is key to getting answers that benefit you the most.

"A remanufacturer should know manufacturing inside-out. And they should know that there is a ton of potential in remanufacturing machinery or rebuilding a component of a critical machine," said Moscarino.

That potential is key. Instead of simply restoring a machine, remanufacturing can make the machine better, particularly as needs may have changed since it was purchased. Controls can be retrofitted and upgrades are possible at almost any stage of the process. With years of experience in the field, Moscarino noted that a good remanufacturer is able to minimize disruption, improve functionality and help a company bring new life to critical systems. "I ask two important questions whenever I am talking with a client about the possibility of remanufacturing," he said. "First, what is the 5-10-year outlook for the machine? And second, what systems are required to fulfill current needs?"

Due to the significance of this undertaking, Moscarino also recommends that companies ask a series of critical questions when considering remanufacturing.

• What is the approach to upgrades?

"We are always bringing upgrade ideas to the job," said Moscarino. "It is not unusual for us to reconfigure components to standards that are better than those of the original OEM. We make more adjustments than were likely made by the original manufacturer, allowing the components to wear longer."

• Safety guidelines often change. Will the process ensure that current standards are met?

In the case of one company, Moscarino's team at Ultra Tech Machinery made upgrades to outdated safety components when safety controls and guarding were not up to code. Such review and safety upgrades should occur with every rebuild. Because standards are always evolving in response to industry developments, this step is crucial.

• Do they have the scope of capabilities to handle your work? Are they prepared to work on site?

Remanufacturing is not a project

that a small shop can undertake. It is a strategic, time-sensitive process. "Our installation crews are highly efficient," said Moscarino. "We can dedicate teams on more than one job simultaneously. These crews are very engaged at the plant, available for meetings and production reviews. When they go for the installation, it is done with precision to mitigate unnecessary downtime."

Requirements for direct engineering support, forecasts on system viability—there are many issues that come with having a strategic approach to this work. "A remanufacturer should think beyond the current state of your process and help you think that way as well," said Moscarino.

• Do they ask questions you would not think of?

• What is the communication structure?

Will the team meet with you on site as often as needed? Will they provide project installation plans, drawings and documentation? Is there dedicated

service and support? "You should feel as confident in the remanufacturing approach as you would in a completely new design-build project," said Moscarino.

• Are components outdated, difficult to obtain or out of production?

Working with a remanufacturer that can reverse-engineer parts saves time and money. An OEM may not stock the part, may have overseas shipping or other systemic delays. "In one case, Ultra Tech was able to save a company \$10,000 each on four machines, while completing the job in 8-10 weeks, not the 20 that would have been required for new OEM installations," said Moscarino. And once the part is engineered, a good remanufacturer can replicate it as needed, for a more sustainable, money-saving process.

• Do they understand your business and treat your project accordingly?

The remanufacturer should be able to run a rebuild like a special engineering project, with run-off requests, documentation, drawings and checks and

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balances that relate to the customer's industry and process.

"This is not a case of one size fits all," said Moscarino. "Your remanufacturing consultant should be able to advise you on the scope of your project, based on various levels of remaking a machine or its components.

"At some point in every remanufacture, we find a solution that none of us had seen before, something that will save our client time or money or dra-

matically improve how they run their systems," concluded Moscarino. "That is the moment when the value of a smart remanufacturing process becomes obvious."

For more information contact:
Ultra Tech Machinery
297 Ascot Parkway
Cuyahoga Falls, OH 44223
330-929-5544
www.utmachinery.com

DRO with Touchscreen for Machining

Continued from Page 68

axes and a spindle with the PT 8016 "ACTIVE Version".

This new HEIDENHAIN PT 8016 DRO features a shop-hardened 12" color TFT touchscreen for an IP65 front panel and an IP40 back panel. Users can plug-in up to six encoders - either 1Vpp or 11μApp incremental or absolute EnDat 2.2 pure serial. It has storage for up to 100 datums and 100 tool parameters, as well as the capability to

create, store and execute programs.

The PT 8016 replaces HEIDENHAIN's PT 880. It stands alongside the recently released ND 5023 and ND 7013 to round-out the new HEIDENHAIN family of digital readouts.

For more information contact:
HEIDENHAIN Corporation
333 E. State Parkway
Schaumburg, IL 60173-5337
847-490-1191
www.heidenhain.us

Maximize Up Time

Continued from Page 68

testing to the same standards as our factory in Germany," said the spokesperson.

Only OEM parts are used to repair Kessler product. The product is put through a rigorous programmed runoff procedure, which ensures all tolerances are met.

All Kessler service partners receive factory training on a yearly basis, and have direct support from the Kessler team of experts.

For more information contact:
Kessler USA Inc.
44099 Plymouth Oaks Blvd.
Plymouth, MI 48170
734-404-0152
info.usa@kessler-group.biz
www.kessler-group.biz

ServicePlus Program

Continued from Page 68

processes, such as: technical consultation; production of tooling plans and parts programs; setting up the new parts until they reach process capability (Cpk); production support during the start-up phase; optimizing productivity during the start-up phase; and more.

Customized Reconditioning

"Reconditioning provides a second service life for your EMAG machine tool," said the spokesperson.

Tailored services include procurement of the required tools and clamping devices; creation of NC programs; procurement of required automation components; replacement of guides and drive units and spindle units; upgrading of CNC controls; and much more.

Retrofit

As an economic alternative to purchasing new machines, EMAG provides completely and partially reconditioned machines from the EMAG Group.

Retrofitted machines are high-quality machines that allow recycled and refurbished components to keep machining quality high, regardless of age. These recycled components include a main body made out of MINERALIT, which is several years old, and the overhead slides made of cast iron.

The retrofitted machines do not just get a new look; the mechanics and geometry of the machine are also re-

conditioned. The electrical, hydraulics and cooling lubricant supply are completely refurbished or replaced.

Modular retrofits are also available to suit individual process requirements and budgets. This program includes six modules that build on one another and can be implemented either individually or in stages.

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jmoore@emag.com

Press Parts, Repairs and Rebuilds Offered to OEMs



Part of the Schuler Group, a technological and global market provider in forming technology, BCN's (Bliss, Clearing and Niagara), parts and products are available at the company's 180,000 sq. ft. facility in Hastings, MI. At this ISO 9001 certified facility, 150 skilled technicians and engineers manufacture quality parts for various pieces of equipment. These include face bridge mills, CNC lathes, CNC boring mills, surface grinders, rotary grinders, turret lathes and others.

BCN technical services offer a complete range of related products, including spare parts, repair, inspections, remanufacturing, rebuilds and modernizations.

Modernization services include complete press teardown and analysis, engineering analysis, repair or manufacture of parts and assembly that shows the original OEM specs. Also available are field service, on-site repair, trouble shooting, press relocations and press inspections.

Press rebuilds and upgrades are

available for clutch and brake systems, overload systems, speed changes, automated die changes, can machinery and electrical controls.

Remanufacturing is offered on all brands of mechanical presses/hydraulic presses and some forging presses.

OEM users can quickly receive their needed parts, due to a unique parts record that contains over 300,000 parts. These include clutches, brakes, gears, bearings, conversions/upgrades, perishable parts, frames and connections. In addition to the brands that make up BCN, it also carries USI, Toledo, Consolidated Press, Wilkins and Mitchell and Warco.

For more information contact:
Tony DeMerle, Director of Sales
Bliss Press Systems
1004 East State Street
Hastings, MI 49058
734-865-0949
Anthony.DeMerle@blisspressusa.com
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Setco Adds Fifth North American Service Center

Setco has announced its fifth North American Service Center location that opened in Ramos Arizpe, Coahuila, Mexico.

This newest Setco Service Center offers a variety of solutions for spindle, slide and milling head repair and rebuild services, including spindle removal and install, vibration analysis and upgrades. Services are geared toward the automotive and aerospace industries that thrive in the Nuevo León, El Bajío and Chihuahua regions.

Setco is capable of repairing and rebuilding over 350 brands of spindles, and of virtually any type, with particular experience in Weiss, NTC, Kessler, GROB and OKK spindles.

"We are excited to offer this new, enhanced level of support for Mexico," said Jeff Clark, President of Setco. "Having a physical presence in Ramos Arizpe will speed up our repair turn-around time for our partners and customers in Mexico. We are confident that Setco's attention to quality, and our 107 years of designing spindles, will benefit and support the manufacturing base in these regions to assist in the local economic growth. With five Service Centers in North America, we are becoming a local repair shop to customers across the continent."

For more information contact:
Setco
Tom Hogan
5880 Hillside Avenue
Cincinnati, OH 45233
734-320-3293 / 248-888-8989
TomHt@setco.com
www.setco.com

Life Services Offers Complete Care of Equipment

SW North America offers service for machine tools and production systems; spare parts designed and engineered for equipment; commissioning and set-up services; and training, covering six modular areas in what the company calls Life Services.

The six categories of Life Services cover:

- Training through lifeacademy, conducted on site at the customer's facility or available through SW's training centers in North America, Europe and China
- Productive production system startUp
- Monitoring, collecting and analyzing machine data for predictive maintenance and for assuring a number of production efficiencies
- 24/7 support and help online or in person
- Spare parts including assembled modules plus a strategy for planning when needed
- Upgrade assurance that production evolves along with SW engineering

and production advances.

Training through SW's lifeacademy covers a customized combination of coursework and targeted individual consultation to achieve efficient operation, maintenance and programming of SW equipment. Emphasizing hands-on instruction, worker understanding of SW systems continues appreciating throughout equipment life cycles, with high productivity as the initial benefit.

Machine commissioning services through startUp not only cover initial machine set-up, but also an SW technician available on site for a defined period of time for advice and hands-on

help. From installing custom fixtures to identifying and eliminating any squeaks, efficient set-up leading to productive operation from the start is offered.

Collecting, monitoring and compiling SW equipment data provides numerous advantages of digitalization and the Fourth Industrial Revolution (Industry 4.0): better predictive maintenance, reduced downtime, quickly simulating and achieving production advantages and increased production efficiencies. Services include pilot project analysis, production process and material flow consulting; and model-

ing the digital factory for various simulation scenarios.

For more information contact:
SW North America
30160 Lyon Industrial Ct.
New Hudson, MI 48165
734-736-4072
contact.na@sw-machines.com
www.sw-machines.com

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Hands-on Robotic Programming Classes for Beginners and Advanced Users



As part of its mission to make the advantages of collaborative robotics widely accessible, Universal Robots (UR) has launched a worldwide network of Authorized Training Centers that expands on the company's Universal Robots Academy online training. New hands-on classes will teach core and advanced pro-

gramming skills to cobot users regardless of their robotics experience or backgrounds, using certified trainers hosted by Universal Robots and its global channel partners. "Classes will broaden users' understanding of Universal Robots' cobots and their endless range of use cases, while providing opportunities for

hands-on practice in real-life applications," said a company spokesperson.

Three U.S. based Authorized Training Centers (ATC) are now opening at Universal Robots' offices in Ann Arbor, MI; Long Island, NY; and Irvine, CA. Ten additional ATCs spread across Europe and Asia have already started welcoming students. Universal Robots expects to have 50 fully authorized centers around the world up and running by the end of 2019, approximately 15 of those in North America. So far, 500+ customers have successfully completed the training at the new centers. Some centers are run by UR while others are operated by its partners. The share of partner-operated entities is expected to grow rapidly in the coming months.

"Automation addresses both our current labor shortage and the looming skills gap," said Stuart Shepherd, Regional Sales Director of Universal Robots' Americas division. "Universal Robots has offered a unique platform, targeting these issues by providing free online robotics training modules through our Universal Robots Academy, which has been grown

rapidly since the launch two years ago. We are excited to extend this popular training out to real-life classrooms as well, enabling manufacturers to expand their use of collaborative robots and drive even more value from their automation investments and their employees."

Empowering Employees through UR Academy Training

Since Universal Robots Academy was launched in 2017, more than 55,000 users from more than 130 countries have signed up for the online training. A recent example is Darex, a small U.S. manufacturer that wanted to get employees excited about the arrival of UR cobots and engage them in the day-to-day operations. The company also needed to promote a staff member to move into the role of a robot technician to oversee the company's two cobot applications. Interested employees were directed to study basic robot programming using the online Universal Robots Academy modules, leading to a programming contest for them to compete for the new role.

26-year-old Brittany Mohrman won the robot technician position and said, "The online UR training taught me things like understanding different program cycles, adjusting waypoint changes and knowing where the tool center point and center of gravity on the robot is. My job is definitely more fun and interesting now."

New Authorized Training Classes Cover a Range of Programming Skills

Universal Robots Certified Trainers will conduct training modules that cover a range of core and advanced cobot programming skills, including cobot scripting, industrial communication and interface usage. Small class sizes with student-centered objectives and hands-on practice with UR cobots ensure that participants come away with valuable skills they can apply immediately in their workplace.

The modules of the Authorized Training Center program include:

- Core: For any user of a UR cobot who has completed the online modules. Covers safety set-up, basic applications and flexible redeployment.
- Advanced: For cobot users, technical sales people and integrators with a practical need to optimize applications or find new ways of deploying UR cobots. Covers scripting, advanced uses of force control and TCP, conveyor tracking and performance review.
- Industrial communication: For users and developers who need to integrate cobots with third-party devices. Covers modbus TCP, FTP server, dashboard server, socket communication, Ethernet/IP and Profinet.
- Interfaces: For users and developers who need in-depth knowledge on how to interface with UR cobots using script interfaces. Covers UR scripting, socket communication, client interfaces (port 30001-30003), real time data exchange and XML/RPC.

For more information contact:

Universal Robots USA
5430 Data Court, Suite 300

Ann Arbor, MI

844-462-6268

ur.na@universal-robots.com

www.universal-robots.com/academy



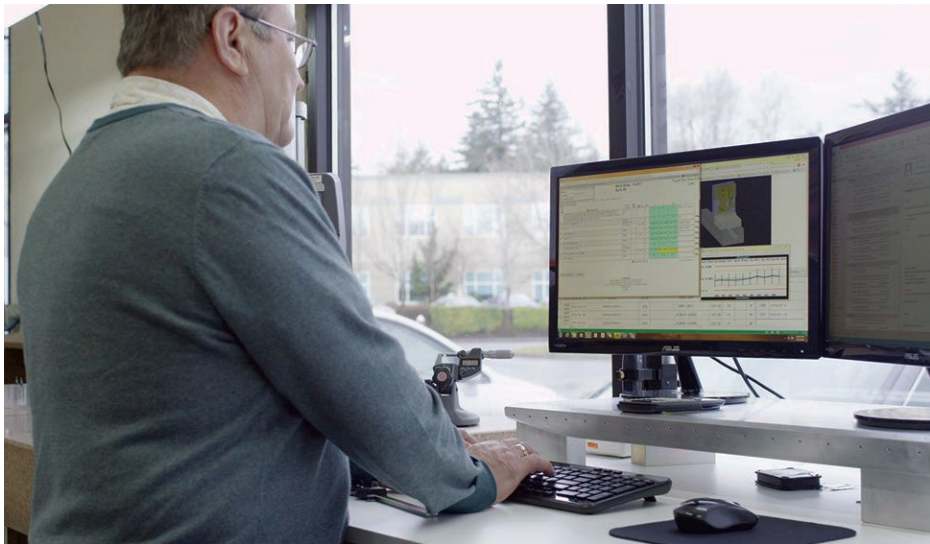
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ProShop USA Provides QMS Consulting Assistance



To facilitate company compliance with quality management systems (QMS) organization and documentation requirements, ProShop USA, Inc. has started providing QMS consulting assistance to users of its ProShop manufacturing enterprise software. "ProShop USA's consulting assistance helps manufacturers take full advantage of the organizational, documentation and access capabilities provided by ProShop software with special attention to a company's specific operations and challenges," said a company spokesperson.

QMS functions of ProShop software incorporate ISO 9001 standards as well as specialized standards based on it, including ISO 13485 for medical device manufacturing; ISO/IEC 27001 for information security; AS9100 for aerospace manufacturing; API Spec Q1, a company-level certification based on American Petroleum Institute (API) oil and gas equipment requirements; and CFR820, a current quality system regulation (QSR) enforced by the FDA for medical equipment.

Paul Van Metre, President of ProShop USA, said an integrated, digital approach to quality systems management is essential for effective quality improvement. "We have heard too many stories of companies hiring a QMS consultant who was more concerned with getting the client a certificate, and not focusing on the underlying business processes or having an efficient system of managing the QMS. If the system is inefficient, then making changes, getting approvals, revising documents and replacing outdated materials builds inertia that stifles change. The QMS function of ProShop software becomes a tool for driving quality improvement. That is what ISO is all about—developing robust business processes that comply with the standard. Plus, providing an easy way to manage revisions and updates can considerably reduce the cost of compliance, and allow the QMS to be an effective driver of continuous improvement. Our clients were asking for a faster, less costly and more efficient way to become certified."

To meet the demand, ProShop USA has hired three experienced QMS specialists, including one who is an ASQ Certified Quality Auditor.

ProShop software is a comprehensive web-based, paperless shop management system engineered to benefit small-

to medium-sized manufacturing companies. "The company often refers to it as a 'Digital Ecosystem' because it comprises integrated modules for managing a shop's enterprise resource planning (ERP)

operations as well as manufacturing execution system (MES) and QMS functions," said the spokesperson.

The ProShop software QMS module digitally integrates quality standard compliance data and documentation from multiple quality management systems. Its capabilities are engineered to enable users to streamline and expedite fulfillment of increasingly rigorous customer demands for quality systems reports, certifications and traceability.

ProShop software modules permit documentation of all elements of QMS including procedures, tasks, training and organization charts, and make the information immediately available for audits, updates and sharing within a facility. ProShop may be hosted in the cloud or on site, depending on the user's preference.

For more information contact:

ProShop USA, Inc.
101 Prospect St., Suite 203
Bellingham, WA 98225
360-515-7576
contact@adionsystems.com
www.ProShopERP.com

The Jordan Company Acquires ARCH Global Precision

ARCH Global Precision, a Strength Capital Partners and Main Post Partners platform company that is focused on manufacturing precision cutting tools, precision machined industrial components and medical implants and instruments, has been acquired by The Jordan Company (TJC).

Eli Crotzer, President and CEO of ARCH Global Precision and the entire ARCH senior management team intend to continue operating in their current roles under TJC's ownership. "On behalf of the entire ARCH team I would like to thank the good folks at Strength Capital Partners and Main Post Partners for their support and partnership over the last several years," said Crotzer. "Together we have achieved an extraordinary number of important milestones in building ARCH into a leading high-precision metalworking

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platform. I could not be more excited to be having TJC acquire ARCH, as they share our vision for growth and cultural preservation at ARCH. I am confident that this next chapter of growth at ARCH with TJC will be every bit as rewarding and energizing as the last several years have been under the ownership of Strength Capital Partners and Main Post Partners," concluded Crotzler.

"We are thrilled by this excellent outcome. Our investors will receive a very good return on their investment and the company is getting an ideal partner for the next leg of its incredible growth," commented Mark McCammon, Managing Partner at Strength Capital Partners.

"We are grateful to the management team at ARCH who have led a significant transformation in ARCH's business since our investment, and we wish them well under new ownership," added Scott Bell, Partner at Main Post Partners.

"We are delighted to be partnering with the ARCH management team to support its next phase of growth. ARCH is an industry-leading platform with a best-in-class management team. We will continue to invest heavily in the business to support organic growth and strategic acquisitions," commented Mike Denvir, Partner at The Jordan Company.

For more information contact:
ARCH Corporate

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Nord Modules Launched in U.S., Signs with Distributor

Nord Modules, founded by Bruno Hansen, a co-founder of Mobile Industrial Robots (MiR), has announced its entry into the U.S. market with a new series of flexible material-moving modules that efficiently connect production lines and internal logistics using au-



tonomous mobile robots (AMR).

"The safe, ready-to-use and industrial-quality modules enhance automated heavy-payload transportation between production lines and storage systems and increase the flexibility of production lines by enabling companies to easily use the same AMR for multiple tasks," said a company spokesperson. Staff is freed from this load-and-lift activity to higher-value activities, saving time and money while reducing the risk of injuries and the subsequent workman compensation claims.

"As companies recognize the advantages of mobile robots—automating monotonous, repetitive and injury-prone manual material transportation—they look for new ways to optimize applications to reduce costs and increase productivity," said Hansen. "With our high-quality gates and top modules, they can easily create fully automated systems, with material flowing effortlessly from production lines to the AMR to the warehouse. And standard, off-the-shelf modules make it easy to update lines and flexibly redeploy these mobile platforms for even greater use and faster ROI."

Product Portfolio and New Product Launch

The Nord Modules product line includes the Top Mover that mounts on MiR100 and MiR200 robots to deliver material to and from Nord Modules' gates installed at production lines, storage systems or conveyors. Integrated software and an intelligent touchscreen enable users to adapt the complete system for specialized work processes, forming an efficient automation of internal transportation tasks. Nord Modules offers three types of gate modules, each with different key benefits:

- Solid Gate (SG): Basic standard module that can receive or hold items and can serve as a flexible pick-up point for autonomous mobile robots.
- Wheel Gate (WG): Integrated stop function and manually controlled wheels enable the mobile robot to push items to a pick-up point or further into production.
- Roll Gate (RG): Integrated motor creates a fully automated gate with rolls that can receive and deliver objects from a 90° angle.

All modules offered by Nord Modules are available in either the Flex or new Basic series. The Nord Modules 5-finger Flex series offers maximum flexibility, allowing customers to handle many different load sizes within their



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production or logistics environment. The 3-finger Basic series is designed to deliver a cost-effective option for consistently bigger load sizes.

"With multiple industries embracing the increased automation of AMRs, manufacturers are beginning to demand the additional functionality from value-added providers like Nord Modules that build top modules for our MiR fleet to enable multiple applications within a single facility," said Ed Mullen, VP of Sales, Americas, MiR. "These flexible customizations are key differentiators for MiR and its integrators. We welcome Nord Modules into our partner ecosystem and look forward to how more of our customers will be able to implement our AMRs straight out of the box, speeding the overall integration process for plant needs."

U.S. distributor Hermitage Automation is the first distributor Nord Modules has signed to take its modules into the U.S. market. According to Hansen, the company expects to grow

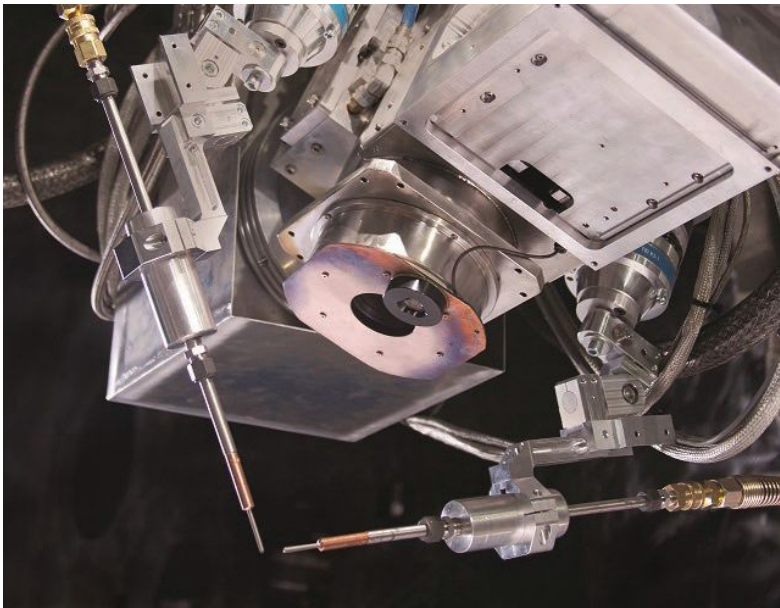
its distribution network extensively in the near future.

"Increasing awareness for our value-added product portfolio and building a strong global distribution network are our current priorities," said Hansen. "As a result, we signed with Hermitage and hired COO Kenneth Henriksen, an established name in the robotics industry. Kenneth brings an extensive engineering background and experience in technical sales and sales management, most recently with robotics companies like Purple Robotics and OnRobot."

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sales@nord-modules.com
www.nord-modules.com

Hermitage Automation & Controls
10080 Patterson Park Road
Ashland, VA 23005
sales@hermitageautomation.com
800-969-3030
www.hermitageautomation.com

Sciaky Joins ADAPT



Sciaky, Inc., a subsidiary of Phillips Service Industries, Inc. (PSI), and provider of metal additive manufacturing (AM) solutions, has joined the Alliance for the Development of Additive Processing Technologies (ADAPT) to expand adoption of its Electron Beam Additive Manufacturing (EBAM) technology in aerospace and other sectors.

Headquartered at Colorado School of Mines in Golden, CO, ADAPT is an industry-academia consortium that advances data informatics and characterization technologies to optimize processes, materials and parts for AM. "A barrier to AM process qualification that ADAPT will work on, in collaboration with Sciaky, is the lack of fundamental understanding about how the process variables effect material microstructure and final part properties," said an ADAPT spokesperson.

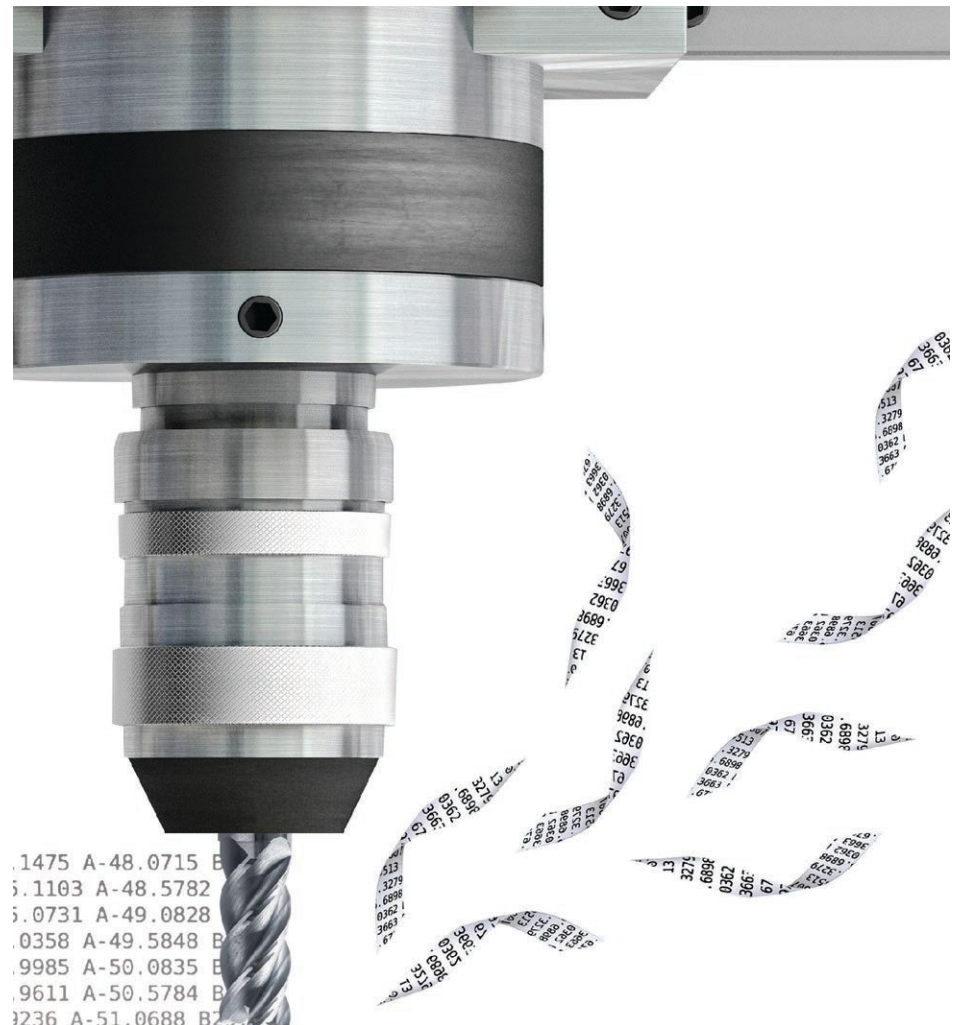
"Sciaky is pleased to work with the innovators of this higher learning consortium," said Scott Phillips, President and CEO of Sciaky, Inc. "We are always striving to break new ground with our EBAM process, as well as capture critical performance data on new applications."

"As the most widely scalable metal AM solution in the industry (in terms of

work envelope), Sciaky's EBAM systems can produce parts ranging from 8 in. (203 mm) to 19 ft. (5.79 m) in length," said a Sciaky spokesperson. "EBAM is also the fastest deposition process in the metal AM market, with gross deposition rates ranging from seven to 25 lbs. of metal per hour. EBAM brings quality and control together with Interlayer Real-time Imaging and Sensing System (IRISS), which is the only real-time adaptive control system in the metal 3-D printing market that can sense and digitally self-adjust metal deposition with precision and repeatability. This innovative closed-loop control is the primary reason that Sciaky's EBAM 3-D printing process delivers consistent part geometry, mechanical properties, microstructure and metal chemistry, from the first part to the last."

"Sciaky's EBAM is the only industrial metal 3-D printing process with approved applications for land, sea, air and space," concluded the spokesperson.

For more information contact:
Sciaky, Inc.
4915 W. 67th St.
Chicago, IL 60638-6493
877-450-2518
708-594-3800
www.sciaky.com



.1475 A-48.0715 B
.1103 A-48.5782
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.0358 A-49.5848 B
.9985 A-50.0835 B
.9611 A-50.5784 B
236 A-51.0688 B
.8861 A-51.5539 B28.4544 F686.13
.8486 A-52.0331 B27.3917 F710.23
.811 A-52.5057 B26.2988 F734.35
7733 A-52.9708 B25.1754 F758.19
7356 A-53.4276 B24.0211 F781.51
5978 A-53.8755 B22.8357 F803.99
56 A-54.3136 B21.6189 F825.37
22 A-54.741 B20.3706 F845.28
5841 A-55.157 B19.091 F863.38
5461 A-55.5607 B17.7803 F879.41
508 A-55.9513 B16.4387 F893.1
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1933 A-57.0362 B12.2349 F918.07
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3104 A-57.5704 B10.5704 B
2781 A-57.8405 B9.4205 B
2358 A-58.1106 B8.2706 B
1935 A-58.3807 B7.1207 B
1512 A-58.6508 B6.0708 B
1089 A-58.9209 B5.0209 B
666 A-59.1910 B3.8710 B
243 A-59.4611 B2.7211 B
101 A-59.7312 B1.5712 B
N29 X-.3059 Y.6084 Z-4.8861 A-51.5539 B
N30 X-.1599 Y.6058 Z-4.8486 A-52.0331 B
N31 X-.0138 Y.6033 Z-4.811 A-52.5057 B2
N32 X.1324 Y.6008 Z-4.7733 A-52.9708 B2
N33 X.2786 Y.5984 Z-4.7356 A-53.4276 B2
N34 X.4249 Y.5961 Z-4.6978 A-53.8755 B2
N35 X.5713 Y.5939 Z-4.66 A-54.3136 B21.
N36 X.7177 Y.5917 Z-4.622 A-54.741 B20.
N37 X.8641 Y.5896 Z-4.5841 A-55.157 B19
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N39 X1.1572 Y.5857 Z-4.508 A-55.9513 B1
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N41 X1.4503 Y.5821 Z-4.4316 A-56.6898 B
N42 X1.597 Y.5805 Z-4.3933 A-57.0362 B1
N43 X1.7436 Y.5789 Z-4.355 A-57.3063 B1
N44 X1.8902 Y.5771 Z-4.317 A-57.5704 B
N45 X2.0368 Y.5753 Z-4.2789 A-57.8405 B
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N47 X2.3300 Y.5717 Z-4.2023 A-58.3807 B
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N49 X2.6232 Y.5681 Z-4.1257 A-58.9209 B
N50 X2.7698 Y.5663 Z-4.0874 A-59.1910 B
N51 X2.9164 Y.5645 Z-4.0491 A-59.4611 B
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N53 X3.2096 Y.5609 Z-3.9725 A-59.9913 B
N54 X3.3562 Y.5591 Z-3.9342 A-60.2514 B
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N56 X3.6494 Y.5555 Z-3.8576 A-60.7716 B
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N74 X6.2882 Y.5231 Z-3.1682 A-65.4534 B
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N81 X7.3144 Y.5105 Z-2.8901 A-67.2741 B
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N83 X7.6076 Y.5069 Z-2.8135 A-67.7943 B
N84 X7.7542 Y.5051 Z-2.7752 A-68.0544 B
N85 X7.9008 Y.5033 Z-2.7369 A-68.3145 B
N86 X8.0474 Y.5015 Z-2.6986 A-68.5746 B
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N89 X8.4872 Y.4961 Z-2.5837 A-69.3549 B
N90 X8.6338 Y.4943 Z-2.5454 A-69.6150 B
N91 X8.7804 Y.4925 Z-2.5071 A-69.8751 B
N92 X8.9270 Y.4907 Z-2.4688 A-70.1352 B
N93 X9.0736 Y.4889 Z-2.4305 A-70.3953 B
N94 X9.2202 Y.4871 Z-2.3922 A-70.6554 B
N95 X9.3668 Y.4853 Z-2.3539 A-70.9155 B
N96 X9.5134 Y.4835 Z-2.3156 A-71.1756 B
N97 X9.6600 Y.4817 Z-2.2773 A-71.4357 B
N98 X9.8066 Y.4799 Z-2.2390 A-71.6958 B
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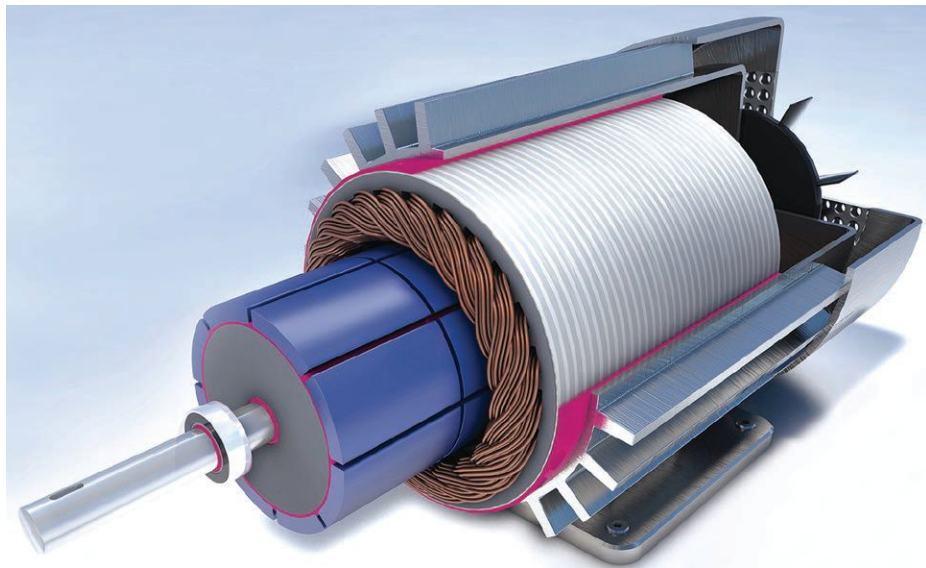


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DESIGN

Structural Adhesive Offers High Temperature Stability



DELO, a manufacturer of industrial adhesives for automotive, consumer and industrial electronics applications, offers a structural adhesive that provides increased stability at high temperatures. DELO MONOPOX HT2860 achieves up to three times the strength at a temperature of 150 °C compared to previous product generations.

Suitable for bonding magnets in electric motors used in cars, drilling, milling tools, washing machines, as well as in many other applications, this new adhesive has a glass transition temperature (Tg) of 168 °C. As a result, the elas-

ticity (Young's modulus) below Tg does not change significantly, allowing the adhesive to achieve a high temperature stability with flexibility only increasing if the temperature rises above 168 °C.

DELO MONOPOX HT2860 is designed to achieve a strength of 18 MPa on sand-blasted aluminum at 150 °C. This is up to three times higher than standard epoxy resins.

Achieving a compression shear strength of 65 MPa on aluminum and 55 MPa on ceramics at room temperature, DELO MONOPOX HT2860 has

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Soft Grip Back Blow Safety Air Gun

"EXAIR's new soft grip back blow safety air gun uses the smallest back blow nozzle available to deliver a blast of air to effectively blow debris and liquids from inside small pipe or hose diameters, channels, bores, holes, internal threads and other internal part features," said a company spokesperson.

The ergonomic design of the air gun keeps the operator's hand in a comfortable position so it can be used for hours of continuous use without fatigue.

An array of holes on the Model 1004SS M4 back blow air nozzle provides a forceful back-facing 360° airflow

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GridLine Workshop Cabinets



Hoffmann Group USA has announced the availability of its new GARANT GridLine Workshop cabinets. GARANT's GridLine series focuses on three key areas of usability: ergonomics, efficiency and design. The cabinets were developed using a planned, common grid technique, designed to create a multitude of possibilities for combining and extending the system. Aesthetics and functionality are ensured, even if changes are made to the workshop equipment in the future.

"The new GARANT GridLine workshop cabinets are completely focused on functionality, design and er-

gonomics," said Charlie Slagle, President and CEO of Hoffmann Group USA. "The result is elegant and durable workstations and storage solutions that fit into any working environment, making day-to-day work easier."

The modular nature of GARANT's new GridLine series allows for individualized combinations of matched components. Cupboards have uniform external dimensions and dividing materials fit into any drawer. The products are user-friendly, and easy to handle.

To ensure that the new workstations and storage equipment easily fit

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Next Generation Portable Oil Analyzer

Spectro Scientific, a supplier of oil, fuel and processed-water analysis instrumentation and software, has released a new generation of its field-proven FluidScan mid-infrared spectrometer handheld oil analyzer.

Patented FluidScan technology collects light transmitted through one drop of a fluid sample and registers the infrared absorption spectrum. The analyzer compares spectrum data to a built-in fluid reference library and provides rapid, on-site analysis of in-service lubricants. Analysis takes less than one minute, users need no special training and the process requires no solvents or complicated cleanup.

The new generation FluidScan analyzers have upgraded digital electronics and faster embedded processors with new software and calculation algorithms that speed the analysis process. It hosts more data and algo-

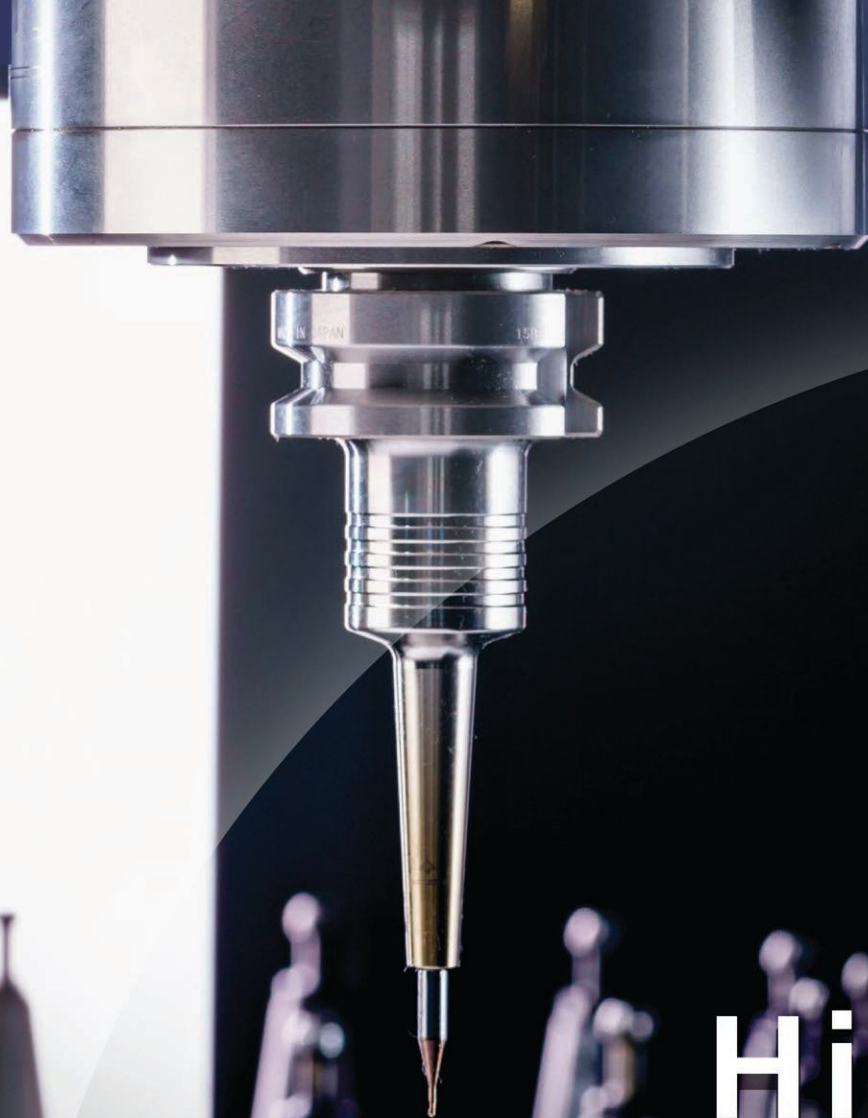
rithm storage with much larger memory. The new oil library includes almost 800 oils and greases of a wide range of chemistry and brands. The grease library is significantly expanded and a new water index parameter helps users track dis-



solved water trends in used grease.

New software algorithms include a fluid integrity parameter that permits

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Structural Adhesive Offers High Temperature Stability

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enhanced adhesion to metals, as well as to temperature-resistant plastics, ferrite compounds and ceramics.

The versatile epoxy resin can be heat-cured in an oven for 40 minutes at 150 °C or by induction. Induction-curing requires metal joining partners and enables a reduction in the process time by 90%.

DELO MONOPOX HT2860 has a processing time at room temperature

of four weeks before curing and an operating temperature range of -55 °C to 220 °C. It is suitable for bonding under high static or dynamic loads.

For more information contact:
DELO Industrial Adhesives LLC
144 North Road, Suite 2650
Sudbury, MA 01776
978-254-5275
info@delo.us
www.delo-adhesives.com/us/

Next Generation Portable Oil Analyzer

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users to determine if a substance with a different chemistry is mixed with the lubricant, a common problem in oil top-off process. In addition, a new biodiesel detection algorithm measures the percentage of biodiesel fluid in engine oil. When combined with the Spectro Scientific FDM 6000 series fuel dilution meters, a more accurate measurement of total biodiesel and diesel dilution percentage can be obtained. Fuel dilution is one of the biggest problems identified in engine oil analysis.

A new ability to make corrections to stored factory fluid data eliminates the need to create new user fluid entries to correlate FluidScan results with those from commercial laboratories.

Ergonomic improvements include a 50% larger and brighter LCD screen. A new LED light in the sampling head enables users to quickly check for air bubbles in an oil sample, supporting improved measurement quality.

FluidScan analyzers includes two models. FluidScan 1000 is designed as

a standalone unit for fleet operations or oil analysis labs, supported by Spectro's Fluid Manager software. FluidScan 1100 is engineered to operate on a standalone basis or as part of a Spectro MiniLab configuration. Fluid Manager software and the newly introduced TruVu 360 Device Console (TDC) software support it.

Spectro Scientific President and CEO Brian Mitchell said, "This new release represents the ongoing evolution of FluidScan analyzers and also illustrates the continual improvement of Spectro products overall, as our company constantly works to provide our customers with the most advanced, precise and convenient fluid analysis tools possible."

For more information contact:
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One Executive Drive
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Chelmsford, MA 01824
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www.spectrosci.com

GridLine Workshop Cabinets

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into an already existing color scheme, Hoffmann Group USA has changed the standard color from steel blue to anthracite. The subtle dark grey of the new workstations and storage equipment allows harmonious combination with already existing colors. In addition, there are 10 other well-known colors available, at no charge.

The new GARANT GridLine series swing and sliding door cabinets are available with both sheet steel and viewing window doors. The swing doors offer self-closing hinges and the sliding doors are self-locking, making them high quality. LED internal lighting is an option as well; and can be used to either illuminate the entire cabinet interior or selected compartments. Customers will be able to quickly find the objects they want – even in darker surroundings.

The GARANT GridLine series also offers a state-of-the art cable management system and a removable raised floor. In addition, inclined shelves with rigid foam inserts make it possible to organize the cabinet interior in a clear and structured manner while adjustable feet allow for the convenient and quick positioning of the cabinets.

To bring the design full circle, the

GARANT GridLine range offers tool cabinets that are real space-saving wonders, due to a new drawer concept with full extension. The drawers are extremely robust, with a load capability of 165 lbs. to 440 lbs., that can hold heavy tools without a problem. Optionally, all drawers can be fitted with ComfortClose self-closing and damping. This option provides additional protection for delicate tools and components. The new concept consists of boxes, recesses/troughs and eForm rigid foam inserts - bringing more order to messy drawers. There is also the option of wheels and 2-component push handles, for customers that want to be mobile in the workshop.

All workshop cabinets are produced as torsion-resistant sheet metal designs with smooth surfaces, rounded corners and no sharp edges – ensuring safety and cleanliness. The cabinets are available in 10 standard colors and in selected special colors.

For more information contact:
Hoffmann Group USA
202 N. Seven Oaks Drive
Knoxville, TN 37922
844-448-7725
sales.usa@hoffmann-group.com
www.hoffmann-group.com

Soft Grip Back Blow Safety Air Gun

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to clear out coolant, chips and light oils from machining processes. This nozzle prevents blowing chips further into a part, tube or pipe and eliminates any safety hazard created by blowing debris out the far end of a pipe or tube. Air consumption is only 4.5 SCFM at 80 PSIG with a low sound level of 75 dBA. The nozzle is manufactured to clean inside openings as small as 1/4" (6 mm) and up to 1" (25 mm). It is constructed of type 316 stainless steel to provide durability and superior resistance to corrosion. The air gun with nozzle is OSHA and CE compliant.

A variety of safety air guns with

back blow nozzles are available for cleaning diameters up to 16" (406 mm). Chip shields to protect the operator from the exiting debris are included with the soft grip, VariBlast Compact and Heavy Duty back blow safety air guns. Extension pipes from 6" (152 mm) to 72" (1,829 mm) are available to provide reach for longer tube and pipe clean out.

For more information contact:
EXAIR Corporation
11510 Goldcoast Dr.
Cincinnati, OH 45249-1621
800-903-9247
techhelp@exair.com
www.exair.com

Semi-Automatic Filtration System



The C-Jaguar is a filtration system with automatic purge system designed to remove 90% of 10 µm aluminum sludge.

Other features include:

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Mount Prospect, IL 60056
224-404-4051
www.nikuniamerica.com

Glue-Down Vinyl



SelecTech, Inc., a manufacturer of innovative flooring products with long-term value and immediate benefits, recently unveiled its new electrostatic discharge (ESD) flooring, GroundFloor Glue-Down Vinyl. The new tile is being sold as part of SelecTech's StaticStop division.

"StaticStop has become known for both our ESD flooring solutions and our patented interlocking technology. Truth be told, StaticStop has always had an ESD offering that could be glued down as well," said Thomas Ricciardelli, President of SelecTech, Inc. "Like all our products, our ESD glue-down offering has improved over the years. So much so we felt it deserved a new name. Hence, the introduction of GroundFloor Glue-Down Vinyl."

GroundFloor glue-down ESD vinyl provides lasting ESD protection with lifetime electrical properties. Ground-

Floor comes in three different styles, each with a variety of color patterns. Those styles include: GroundFloor CVT (available in off-white, steel blue, platinum and gray); GroundFloor PLUS (available in blizzard, apollo, oasis and asteroid); and GroundFloor Designer Series (available in coastal fog, night sky, quarry sand, moss, summer sky, sandbox).

The three styles of GroundFloor come in thickness ranges from 2 mm to 3 mm. GroundFloor CVT comes in either 18.5" x 18.5" or 24" x 24" tiles. GroundFloorPLUS is available in 18.5" x 18.5". The GroundFloor Designer series is available in 2 m x 23 m rolls.

For more information contact:
SelecTech, Inc.
33 Wales Avenue, Suite F
Avon, MA 02322
508-583-3200
contactus@selectech.com
www.selectech.com

Industrial Dust Collector



"The Gold Series X-Flo (GSX) industrial dust collector from Camfil APC is built on 20 years of successful performance of the company's award-winning Gold Series collector," said a company spokesperson. GSX dust collectors are suitable for industrial applications that produce or process fine, fibrous and heavy dusts and fumes.

GSX collectors are designed in modules, so they are easy to build and assemble. Each module handles airflows up to 6,000 CFM using four Gold Cone X-Flo filter cartridges. Camfil de-

signed these filter cartridges with more pleated media and surface area, so they can move more air and process more dust without increasing the collector's overall footprint.

The collector also features a newly-engineered inlet and unique baffle configuration that creates a more uniform airflow, designed to extend the life of the filters. When the filters are pulse cleaned, more dust is channeled directly into the hopper instead of into the adjacent filters.

"GSX dust collectors exceed OSHA mandates for indoor air quality and are tested to meet NFPA and ATEX standards," said the spokesperson. They are available with many explosion protection options including explosion vents, isolation valves, integrated safety monitoring filters and fire-retardant filter cartridges.

GSX collectors are suitable for use in the pharmaceutical, mining, chemical processing industries and more. They also provide a safer work environment in metalworking applications like welding, thermal spray, plasma cutting, laser cutting and abrasive blasting.

For more information contact:
Camfil APC
3505 S. Airport Road
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800-479-6801 / 870-933-8048
filterman@camfil.com
www.camfilapc.com

Tuff Hose for High Pressure Applications

Kurt Tuff Hose is suitable for heavy duty, hydraulic applications. Designed for rugged, high pressure applications, Kurt Tuff hose has 6,500 PSI capacity using less installation space.

"Kurt Tuff Hose has a unique design allowing bending twice as tight as standard SAE hose with half the bend radius," said a company spokesperson. Reinforced internally with two braided layers of high tensile steel wire, this hose retains flexibility with enhanced durability. With an abrasion resistant outer cover (10 times as resistant compared to standard hose cover), Kurt Tuff hose is rated to 1 million impulse cycles.

Additional features include:

- Lightweight
- Withstands temperatures from -40 °F up to 250 °F
- Oil and abrasion resistant synthetic outer cover
- Great UV rating
- Meets or exceeds SAE DIN 20023 requirements
- Meets flame resistant MSHA designation
- "Higher pressure and longer life than similar hoses," said the spokesperson.

Applications for Kurt Tuff hose include a wide range of spiral hose installations with high pressure ratings. Equipment benefiting from the rugged qualities of Kurt Tuff hose include off highway vehicles, oil drilling equipment, trucks, construction equipment,



large machinery and most heavy duty hydraulic applications.

Kurt Tuff hose diameters available range from 1/4" to 1" I.D. and utilizes the Kurt full line of couplings which are interchangeable with other brands. Kurt offers both hose and couplings in cost-effective combination packages and provides special engineering assistance for difficult applications.

Supporting customers fast delivery needs is Kurt's in-stock inventory of over 3 million feet of hose and millions of couplings in thousands of styles to keep customers' systems up and running. Kurt's couplings are made in the USA.

For more information contact:
Kurt Hydraulics
5280 Main St. NE
Minneapolis, MN 55421
866-257-7995
308-787-0127
hydraulicsales@kurt.com
www.kurthydraulics.com

Hydroflow Portable Coalescer

Eriez' Portable Coalescer uses an oleophilic (oil attracting) coalescing plate pack media to remove oils efficiently. This plate pack consists of over 100 sq. ft. of coalescing area for maximum oil removal. The unit is equipped with a standard electric submersible pump, but can be upgraded with an optional air pump or a heavy-duty electric pump for deeper sumps. It can also be used on high temperature fluids such as heavy-duty cleaners.

Because of its portability, a single machine can support tramp oil removal for an entire metalworking shop. These units can also be made stationary to work on large sumps or central systems. Larger flow rate systems can also be custom engineered to meet customers' needs.

Reducing tramp oil is a high priority for all metalworking shops. Excess tramp oil leads to smoke, mist and bacterial infestation of the metalworking fluids, and adversely affects surface finish and reduces tool and dimensional tolerance control. Installing the Eriez Portable Coalescer extends the life of coolants and cleaners, improves machining and preserves valuable tools.

Standard features of the Portable Coalescer include adjustable feet for leveling, adjustable oil removal weir pipe,



tank lid, floating oil collector to skim off oils and dirty fluid, pre-pump strainer and tank drain valve for cleaning. Options include self-priming centrifugal pump for pumping below ground sumps, 316 stainless steel tanks for high or low pH fluids, larger tank sizes and flow rates, 110-volt 50 hertz and 220-volt 50 hertz operation.

For more information contact:
Eriez Manufacturing Co.
2200 Asbury Road
Erie, PA 16506
800-345-4946 / 814-835-6000
eriez@eriez.com
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Mist Collection for Individual Machining Centers

Keller USA, Inc. has introduced a stand-alone mist collection system, ENA-S series, with an operating air-flow range of up to 2,000 CFM, suitable for wet machining processes.

For a user's Smart Factory, the Keller ENA-S can be paired with Pro-Fix, auto-regulating baffle for airflow balancing/optimization, and Condi-

tion Monitoring for web-based diagnostics of a machine.

For more information contact:
Keller USA, Inc.
2168 Carolina Place Dr.
Fort Mill, SC 29708
803-396-2000
info@kellerusa.com
www.kellerusa.com

Filtration Systems for Filtering Grinding Fluid and More



back flushing cartridge filter systems designed with highly accurate temperature control, automatic controlled sludge sedimentation and online monitoring to avoid any shut downs of the filtration system during production," said an oelheld spokesperson. The VOMAT range includes stand-alone and whole plant systems.

Offering a variety of available optional add-on equipment, oelheld can expand the systems to adapt to changing needs in terms of capacity or product quality.

For more information contact:
oelheld U.S., Inc.
1100 Wesemann Drive
West Dundee, IL 60118
847-531-8501
hute-us@oelheld.com
www.oelheld.com

oelheld U.S. is the official distributor of VOMAT Filtration Systems. VOMAT systems are designed for the filtration of micro particles in lubricants used in processes such as grinding, honing, lapping and eroding.

"VOMAT offers high performance

Xometry Receives ISO Certifications

Xometry, a digital manufacturing marketplace, has received ISO 9001:2015 and AS9100D certifications. These certifications are among the industry's most rigorous and reflect the company's commitment to quality.

"ISO 9001 is the world's most widely recognized quality management standard and helps organizations to meet the expectations and needs of their customers," said a company spokesperson. The AS9100 standard goes beyond the requirements of ISO 9001 to meet the rigorous demands of the aerospace and defense industries.

As part of the certification process, Xometry engaged in a thorough audit of its business processes and quality management system.

"We are thrilled to receive this designation. Our team members have a passion for providing great customer service while following the disciplines that give our customers peace of mind regarding on-time delivery, quality and continuous improvement," said Peter Goguen, Xometry's COO. "It is yet another step towards achieving industry 'best in class' status and being able to meet the expanded needs of our customers."

For more information contact:
Xometry
7951 Cessna Avenue
Gaithersburg, MD 20879
240-252-1138
support@xometry.com
www.xometry.com

Annual Software Subscription Options

SmartCAMcnc has announced a new software subscription option that cuts acquisition costs for CAM software.

An Evolving CAM Marketplace

In response to changing market demand, SmartCAMcnc is adding an annual subscription option to its existing 'perpetual-use licenses'. For many years, the CAD and CAM industries have seen accelerated growth in "subscription-only software" offerings, which is a major departure from the decades-old 'buy a software use license with maintenance contract' method. Because both approaches have their place in the market. SmartCAMcnc now offers a choice.

New annual subscription customers pay no up-front software license fees, which for much of the CAM industry makes up the bulk of the start-up costs. Annual subscriptions for production

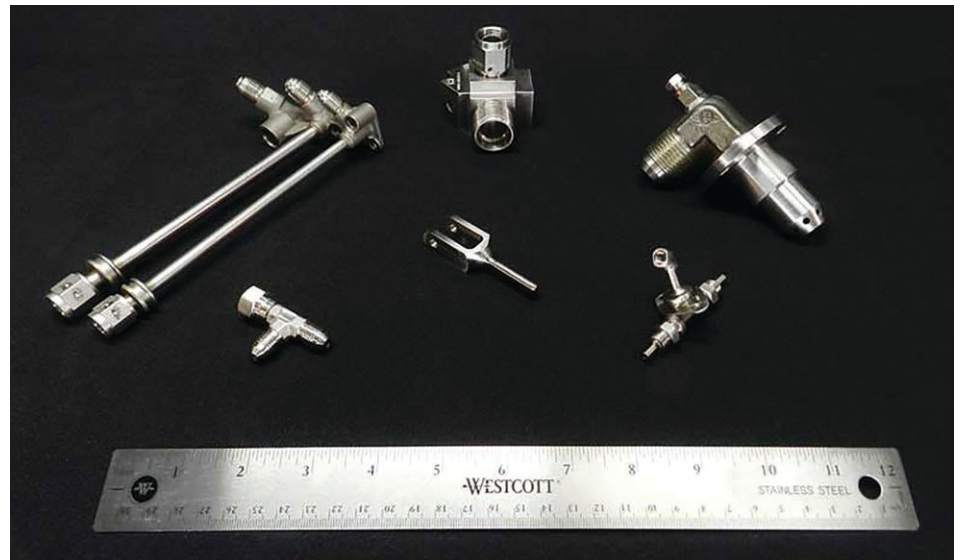
level SmartCAM solutions start as low as \$75/mo., and can be renewed at the customer's option.

A Need for flexibility

"SmartCAM customers now have more flexibility in their software configuration and deployment, and can benefit from the lower acquisition costs," said Gregg Olson, Founder and President of SmartCAMcnc. "All subscription offerings include the high-quality SmartCAM software and technical support customers have enjoyed for over 30 years."

For more information contact:
SmartCAMcnc
1144 Gateway Loop, Suite 220
Springfield, OR 97477
541-344-4563
sales@smartcamcnc.com
www.smartcamcnc.com

Machine Data Collection for Manufacturing Automation



Predator Software reseller Shop Floor Automations (SFA) has announced updates to Predator MDC (Machine Data Collection).

The on-premise machine data collection software solution features and benefits include:

- Monitoring options: Track activity from any number of machines on the shop floor. Equipment can be interfaced over wireless, ethernet and RS232 cabling to extract rich data. "The software features thousands of charts and reports for users, who can then make informed decisions to improve plant performance based on observations. View machine data live on dashboards across the production floor, or do a presentation in the conference room. Seeing machine data not only helps to make better operating decisions – users can also pursue goals of lean production, continuous improvement and overall quality enhancement," said a company spokesperson.
- This software includes Predator DNC, which allows for better machine program communication and part program revision control. Predator DNC also includes state-of-the-art networking tools for legacy, Windows-based

controllers called Secure DNC. The solution can also be integrated with ERP and MES software. Operators can replace bar code readers and handheld terminals for simplified data collection with Predator Touch HMI, which is a big button interface that can be integrated with Predator MDC. This software allows for several protocols such as MTConnect, FANUC FOCAS, Okuma THINC, OPC UA and more to communicate with a variety of equipment.

• In December of 2018, Manufacturing News published a case study in which Arizona manufacturer R&D Manco shared its experience with using MDC. The 30k sq. ft. manufacturing company has a large number of machines that need to be running at optimal efficiency. After just five months of measuring MDC results, spindle uptime increased 10% with month-over-month gains.

For more information contact:
Greg Mercurio, President
Shop Floor Automations, Inc.
5360 Jackson Drive, Suite #202
La Mesa, CA 91942
877-611-5825
619-461-4000
info@shopfloorautomations.com
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455 Sturdevant Road
Gillett, PA 16925
607-425-6531

CT, ME, MA, NH, RI, VT
Compumachine, Inc.
6 Electronics Ave.
Danvers, MA 01923
978-777-8440

Park Industries Recognized as ALPHACAM's Top Global Reseller

Value-added ALPHACAM reseller Park Industries of St. Cloud, MN, was presented with an award naming the company ALPHACAM's No. 1 Global Reseller earlier this year at the International Surface Event-Stone Expo West 2019, which took place in Las Vegas, NV.

Recognized for excellence in both sales performance and customer service, Park Industries is an American manufacturer of stone and metal fabrication machinery that also offers CNC solutions and a variety of additional manu-

facturing services. The company was presented with a trophy for its contribution to ALPHACAM's success by Perry Boyett, Sales & Services Director NAFTA – ALPHACAM.

"Park Industries has been an ALPHACAM reseller for over a decade, and it is the second year in a row that they were the largest reseller globally," Boyett said. "They are phenomenal with customer service and they have really struck a chord in the industry."

The company, which has doubled in



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size since 2015, currently employs a team of more than 320 associates. Among Park Industries' services are a 24-hour technical helpline and specialized customer training.

For more information contact:

Park Industries
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320-251-5077
customerservice@parkindustries.com
www.parkindustries.com

Hexagon Manufacturing
Intelligence Company
250 Circuit Drive
North Kingstown, RI 02852
401-886-2000
www.hexagonmi.com

Collaborative Worker Safety Solution Recognized as IoT Solution of the Year

Hitachi Solutions America, a provider of global industry solutions powered by the Microsoft Cloud, is part of the Internet of Things (IoT) worker safety solution selected as the winner of the Industrial IoT Solution of the Year award by IoT Breakthrough, an independent organization that recognizes the top companies, technologies and products in the global IoT market today. Development partner Advantech accepted the award for the winning solution, which is a collaboration between Hitachi Solutions, Advantech, Behr Technologies (BTI) and Microsoft to deliver a reliable and secure wireless communications solution for private industrial IoT networks.

"We congratulate Advantech for the award and are very pleased to be part of the revolutionary worker safety solution that IoT Breakthrough selected as its Industrial IoT Solution of the Year," said David Bishop, Senior Vice President of R&D at Hitachi Solutions America. "Our IoT Service Hub is a key component of the winning solution and provides a turn-key platform that leverages predictive analytics, AI and machine learning to analyze IoT data and turn it into actionable insights that provide safer work environments and help protect workers' health and well-being."

"While much of the development around IoT solutions focuses on single



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solutions and innovation, the reality is that the true power of IoT will only be achieved through collaboration and interoperability from innovative solutions working together," said James Johnson, Managing Director at IoT Breakthrough. "We are pleased to recognize Advantech and this collaborative effort with BTI, Hitachi Solutions America and Microsoft in progressing the secure wireless connectivity that sits at the core of the IoT and Industry 4.0 revolution."

The collaborative worker safety solution aims to meet the growing demand in the marketplace for robust and comprehensive out-of-the-box wireless industrial IoT communications solutions to connect the various sensors used by industrial and commercial customers in their business intelligence efforts. It combines innovative IoT and robust wireless connectivity to provide industries with unprecedented level of visibility into workers' health and their environments. Sensors installed onsite and in wearables capture environmental data such as temperature, humidity and air quality as well as health data like heart rate and outdoor location.

"Leveraging Hitachi Solutions America's advanced analytics platform, situational data can be distilled into actionable insights on a remote management console, thereby empowering data-driven decision-making and improving the safety and productivity of the cross-industry field workforce," said a company spokesperson.

For more information contact:
Hitachi Solutions America, Ltd.
100 Spectrum Center Dr., Ste. 350
Irvine, CA 92618
888-618-1521
us.hitachi-solutions.com

Sigma Labs Wins Test and Evaluation Program Contract

Sigma Labs, Inc., a provider of quality assurance software under the PrintRite3D brand, has been awarded a Test and Evaluation Program contract with a global materials and service provider in additive manufacturing (AM). The program is designed to demonstrate the value of Sigma's PrintRite3D product capabilities and performance and to validate and quantify the repeatability and variability of AM production processes.

Sigma Labs is installing multiple PrintRite3D INSPECT 4.0 in-process quality assurance systems located in the customer's U.S. facility under the Sigma Rapid Test and Evaluation Program. In support of this program, Sigma Labs will provide hardware, software, training, engineering and metallurgical consulting and support services. This contract marks Sigma's fifth customer since September 2018—including AM providers, oil and gas services and aerospace industry clients—that is conducting various forms of testing and evaluating its technology.

John Rice, CEO of Sigma Labs, said, "Sigma Labs is deeply committed to our In-Process Quality Assurance tools, sup-

porting and moving forward with them. I am confident that this initiative, which marks our fifth customer signed from diverse industries in the past four months, will validate our PrintRite3D technology in commercial-industrial serial manufacturing settings. We believe that going forward, AM technology will play an increasingly prominent role in the aerospace, medical, power generation/energy, automotive and tooling/general industries, all areas which are served by this customer."

Sigma Labs engineers will work collaboratively in U.S. to validate the use of PrintRite3D INSPECT 4.0 to improve manufacturing process consistency within the customer's AM operations. Specific qualification builds of representative geometries will be prepared to assess and quantify machine consistency and variability as well as material process and parameter development.

For more information contact:
Sigma Labs Inc.
3900 Paseo del Sol

Santa Fe, NM 87507
505-438-2576
info@sigmalabsinc.com
www.sigmalabsinc.com

Piping and Equipment Celebrates 50th Anniversary

Piping and Equipment, Inc. (P&E), a subsidiary of Fairmont Supply Company, is celebrating 50 years in business.

Founded in 1969, P&E is a full line distributor of industrial pipe, valves and fittings. "P&E is dedicated to accommodating the changing needs of its customers, while maintaining the same core values that past leaders established," said a company spokesperson.

Gary Cartright, Co-Founder and CEO of P&E, stated, "I am thankful to have been part of P&E's five decades of success. Helping customers through continual product innovation, while

keeping employees at the heart of its strategy, is P&E's true legacy. This is an exceptional opportunity to recognize and thank all our customers, employees and suppliers for their support."

P&E became a subsidiary of Fairmont Supply Company in July of 2007, which allowed P&E to expand into new markets. Tom Pettit, Regional Director, said, "As we celebrate this milestone, we are proud of the achievements we have made, and look forward to the next 50 years of accomplishments. We have devoted ourselves to a half-century of product innovation and manufacturing efficiencies to provide our customers with the highest quality products and services. Throughout 2019, we will be taking a look at where we started, what we have achieved and what our plans are for the future."

For more information contact:
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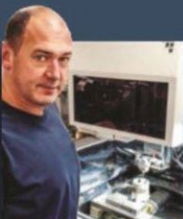
Guy Mignogna
General Carbide Greensburg, PA

"We manufacture more than 50 grades of tungsten carbide tooling for a wide range of industrial wear and metal forming applications. Our Seibu ultra precision oil machine has produced parts with ZERO cobalt depletion at micron level accuracy. Their factory engineers are most helpful an extremely knowledgeable."



Ron Novel
X Cell Tool & Mold Inc. Erie, PA

"We only purchase machines that will give us the best quality & the Seibu has met an even exceeded our expectations. After only two days of training we were producing parts. Their support has been excellent."



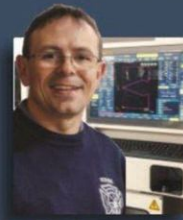
Rob Tustian
Toolco Inc. Plymouth, MI

"At Toolco, we build high precision powdered metal tooling. The carbide parts are tall with complicated geometry so I need a machine that could give us precise corners, straight walls with an excellent surface finish. After comparing all the results, the Seibu was the clear-cut winner. They have exceeded our expectations."



Bruce Palmer
Precision Products Greenwood, IN

"We purchased our first wire machine in 1976 and it was a game changer for us. We have used Seibu wires for many years with no regrets. When it came time to replace our older machines I took a look at what Seibu had to offer and I was sold. Japanese quality and support - what more do you need?"



Roy Manley
Mach III Vinemont, AL

"Mach III, Inc. is a Job Shop that prides itself on providing quick turn arounds on precision components for their customers. Purchasing our Seibu was a great decision that allows our continued customer support to run at high efficiencies."



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60th U.S. Anniversary and Grand Opening Celebration for Tornos



The ribbon cutting ceremony at the Tornos US Corporation grand opening. (l-r) Justin Cochran, District Director for Representative Marty Moylan, State of Illinois; Daniel Maerklin, President, Tornos Technologies US Corp.; Michael Hauser, CEO, Tornos Group; Bruno Allemand, Head of Sales and Marketing, Tornos Group; and Erika Szabo, Marketing Manager Tornos US.

Tornos Technologies US Corporation recently hosted a grand opening celebration of its new customer center in Chicago, IL. With a theme of 'Turning Together', the event commemorated the 60th anniversary of the Switzerland-based company opening its first facility in the U.S. in 1959.

At 15,000 sq. ft., the new customer center includes a spacious, state-of-the-art showroom to showcase each product in Tornos' line-up, a large warehouse to accommodate a spare parts inventory and a larger office space to promote employee growth.

During the two-day event, industry seminars were held that covered topics such as medical, automotive, electronics and Industry 4.0. In conjunction with

the grand opening and the 60th anniversary celebration, Tornos US showcased the U.S. preview of its new 7mm SwissNano. A vast range of precision parts can be machined on the SwissNano, which includes parts for micro-mechanics, electronics, medical and dental segments.

The 7mm SwissNano features 18 tool positions, the SwissNano was designed for small workpieces which require high precision. The machine's 6-axis kinematics offer numerical settings in all dimensions. Supports holding up to four tools can be installed under the back spindle, enabling the machine to perform operations in parallel on the two platens. Its kinematics enable the Industry 4.0 machine to pro-

duce two thirds of watch movement components, from simple to complex, and includes turning, drilling, cutting/deburring and roughing/finishing operations.

The Swiss GT 13 was also on display. With the ability to use up to 30 tools, the Swiss GT 13 features a direct rotary drive guide bush which provides high-speed and accurate machining to reduce cycle time. It is equipped with three motors (two on the platen and one for counter operation) to drive any of its 12 rotating tools. A modular position is available to accommodate the addition of advanced tooling. The rotating toolholders on the rear platen and the counter operation station are easily interchangeable with the Swiss

GT 26 and the Swiss GT 32.

Also on display was the MultiSwiss 8x26. Equipped with eight spindles and eight slides for main operations, and housing up to three tools per slide, the MultiSwiss 8x26 takes the performance of the MultiSwiss range to a new level, both in terms of complexity and productivity. Due to its eight dynamic synchronous motor spindles and fast barrel indexing, the new MultiSwiss 8x26 can produce turned parts, achieving high levels of productivity. Its powerful 11 kW motor spindles feature a torque of 16.1 Nm. Operating independently, the motor spindles are equipped with a C-axis, including the counter spindle. Reaching speeds of 8,000 RPM in only a few tenths of a second, they make a major contribution to the machine's performance. The maximum length of standard parts is 65 mm. As an option, the machine can be equipped with Y-axes to further boost its workability. The machine is available in three configurations: without Y-axis (entry-level); with three Y-axes (intermediate); with six Y-axes (complete) for the most complex parts.

New President of Tornos US, Daniel Maerklin, who was appointed in February 2019, welcomed guests from across the country. Maerklin took part in the ceremonial ribbon cutting along with Michael Houser, CEO, Tornos Group; Bruno Allemand, Head of Sales and Marketing, Tornos Group; and Justin Cochran, District Director for Representative Marty Moylan, State of Illinois.

For more information contact:
Tornos Technologies US Corp.
200 E Howard Avenue, Suite 220
Des Plaines, IL 60018
630-812-2040
info-us@tornos.com
www.tornos.com



Daniel Maerklin, President, Tornos Technologies US Corp. with the SwissNano on its first preview in the U.S.



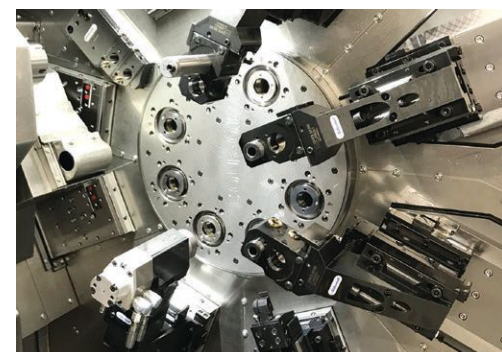
Gonzalo Serrano, Service Technician, Tornos Technologies US Corp with the Swiss GT 13. It features three motors to drive any of its 12 rotating tools and a direct rotary drive guide bush.



(left) Roland Schutz, Service Manager, Tornos Technologies US Corp.; and Paul Cassella, Applied Technology Manager, Tornos Technologies US Corp.; who worked for Tornos for 40 and 50 years respectively.



(left and right) The MultiSwiss 8x26 on display at the grand opening event. It is equipped with eight spindles and eight slides for main operations, and housing up to three tools per slide.

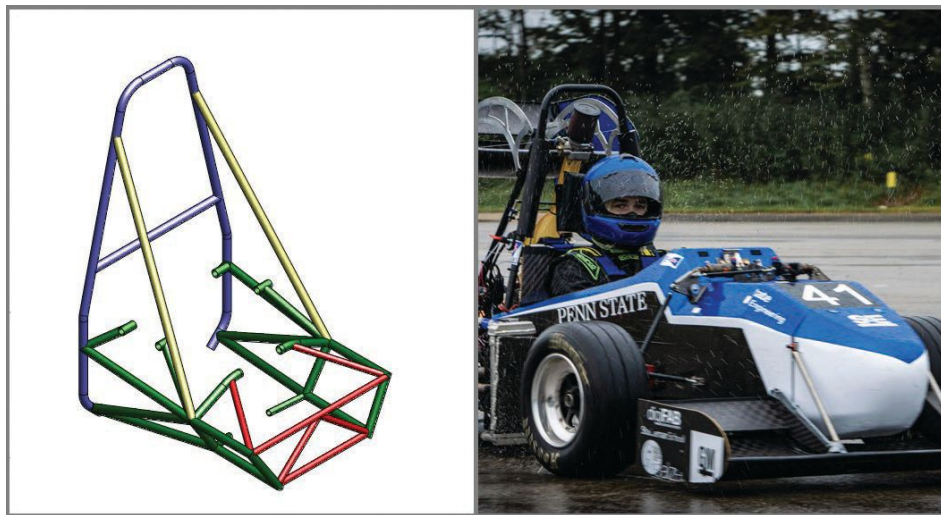


BLM GROUP Sponsors Penn State SAE Formula One Race Team

BLM GROUP USA, a global manufacturer of tube and flat sheet processing solutions, announced that it is a Diamond Level sponsor of the 2019 Penn State Racing Formula SAE team. This is the second year the company has sponsored Penn State as part of the SAE International Collegiate Design Series competitions.

team. "We really value the money and time they invest in us, as well as the quality of the product they provide."

"We are pleased to be able to support hands-on projects such as these," said Mauro Corno, President and COO. "Giving these students the chance to take a vehicle from design to manufacture, build and test gives them some in-



The Penn State vehicle features a combination chassis featuring a composite monocoque and half-steel sub-frame. BLM has provided 37 profile tubing components for welding and fabrication of the steel sub-frame assembly as well as the roll hoops. BLM cut and bent the pieces from four 4130-series steel tubes to the team specifications with parts varying in size from 2" motor mounts to 7' length pieces with bends of up to 75°. The cutting operation was performed using BLM's LC5 Lasertube at the company's Novi, MI, Tech Center.

"Sponsors such as BLM are critical to helping out our team as we do not have access to the machines and equipment required to fabricate all the vehicle components," said Brock Hinton, Manufacturing Lead for the Penn State

valuable real-world experience as well as the excitement of competition."

The Penn State SAE Formula One car ranked in the top 30 out of over 120 vehicles last year. At this competition, teams from all over the world are judged in both static and dynamic events including cost, design, business, acceleration, autocross and a grueling endurance race.

For more information contact:
BLM GROUP USA
46850 Cartier Dr.
Novi, MI 48377-4117
248-560-0080
sales@blmgroupusa.com
www.blmgroup.com

Penn State Racing and
the Formula SAE Competition
www.sites.psu.edu/
pennstateracing

Sonics Celebrates 50 Years of Manufacturing



Continued from Page 1

in 1995 and is currently executive vice president, will be assuming the office of President, effective immediately, while he will be continuing in his role as CEO.

"Over the past 50 years, Sonics has cemented its role as an industry pioneer, acquiring a total of 30 patents (plus 3 pending) for technological innovations, continuing the work started by Robert Soloff, who was awarded the original patent for the ultrasonic method for welding rigid thermoplastic parts," said a company spokesperson. "This groundbreaking assembly technique is now used universally across many manufacturing sectors, especially the automotive, aviation, medical device, electronics, appliance and battery industries."

In his remarks, Robert Soloff noted the myriad ways in which the simple sound waves at the heart of ultrasonic technology are used today. Speaking of "the almost magical force of ultrasonics," he said, "I like to think of our company as a symphony orchestra where everyone has their part, and together we make beautiful music and produce world class ultrasonic products. Our music, however, is mostly in the 15 kHz to 40 kHz range."

The company was joined in its celebration, which also coincided with Soloff's 80th birthday, by several local,

state and federal officials, and included remarks by Attorney General William Tong and Newtown First Selectman Dan Rosenthal, as well as the presentation of proclamations and certificates of recognition.

In addition to welding systems, Sonics' other ultrasonic product lines, including liquid processors, are employed throughout research facilities, hospitals and thousands of laboratories and universities, as well as in the nanotechnology, cannabis, biotechnology and DNA sequencing fields.

Commenting on her expanded role at the company, Lauren Soloff, said, "I look forward to continuing our history of innovation – to developing more high-performance ultrasonic solutions for our customers' varied applications, while continuing to provide them with the kind of service and support that can transform their business. I appreciate the trust my father has shown me, as well as the hard work and support of all the Sonics' employees who have brought us to 50 years of success."

For more information contact:
Sonics & Materials, Inc.
53 Church Hill Road
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ZEISS Acquires GOM

Continued from Page 1

"Our growth strategy expressly mentions the targeted acquisition of highly innovative solutions, technologies and companies, which can reach their full potential as part of the ZEISS Group," said Dr. Michael Kaschke, President and CEO of ZEISS. "By acquiring GOM and thereby expanding our solutions portfolio, we are bolstering the leading position of our Industrial Quality & Research segment and will be able to offer even better solutions for our customers. This is entirely in keeping with our corporate strategy, which is focused on our customers' success."

Combining the ZEISS product portfolio with the optical 3-D measuring technology from GOM has the potential to create new opportunities and expand market access for Industrial Quality & Research. "GOM offers cutting-edge solutions for surface digitization, which will strengthen ZEISS in this area," said the spokesperson. Dr. Jochen Peter, Member of the ZEISS Executive Board and Head of the Industrial Quality & Research segment, said: "With this acquisition, we are pursuing our goal of achieving a leading position in the area of surface measurement and digitization. Customers and users in both areas will benefit from the strengths of GOM and ZEISS in the areas of software and hardware."

Evolve Additive Solutions Will Grow Operations

Continued from Page 1

who outlined the benefits of growing the company's high-tech operation locally, including the talent pool that is readily available in the Finger Lakes region.

"The Finger Lakes region is home to some of the most talent-rich tech companies in the industry," said Empire State Development President, CEO and Commissioner Howard Zensky. "Supporting businesses like Evolve Additive Solutions will further support our efforts to grow the 21st century economy while creating good-paying jobs and generating new opportunities in the region."

Evolve is focusing on its AM technology known as Selective Thermo-plastic Electrophotographic Process (STEP) on products in the automotive, aerospace, medical and industrial markets. Initially, the company plans to expand the manufacturing space at the Brighton facility by 7,000 sq. ft. with plans to add on another 13,000 sq. ft. in the coming years. Supporting the growth of high-tech industries is an integral part of the regionally designed Finger Lakes Forward economic development plan.

Founded in 2017, Evolve Additive Solutions' recently raised \$19 million in equity funding with the LEGO Brand Group and Stanley Black & Decker as the lead investors, with the dollars raised earmarked to commercialize STEP, hire new talent and expand facilities such as the office in Brighton.

"Being part of the ZEISS Group will open up new opportunities for GOM in the future, which will also positively impact the site in Braunschweig and our business partners. By pooling ZEISS and GOM's process and solutions know-how, we can tap into new customer segments and applications," said Dr. Detlef Winter, Managing Director of GOM.

GOM GmbH develops, produces and distributes software, machines and systems for industrial and automated 3-D coordinate measuring technology and 3-D testing. Founded in 1990, the company is headquartered in Braunschweig, Germany, and has a global workforce of about 600 people. Its customers include international companies from the automotive, aerospace and consumer goods industries as well as research institutions and universities. In fiscal year 2017/18, the company generated approximately 150 million euros in revenue.

Once the transaction has been completed, GOM will become part of the ZEISS Industrial Quality & Research segment.

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STEP will sit alongside traditional manufacturing processes on the production floor such as injection molding and CNC and will provide organizations with another asset to get products to market faster, leverage for bridge manufacturing and low volume production runs for manufactured end-use parts.

Steve Chillsczyn, CEO of Evolve Additive Solutions, said, "Our Brighton facility is key to our success and having a first-class facility to attract the best talent possible for materials and process development is essential. We are extremely pleased that Empire State Development recognizes the opportunity our technology can offer to our future customers but also to are current and future employee base in the area."

To facilitate Evolve Additive Solutions growth in the Finger Lakes region, Empire State Development has offered tax credits of up to \$1 million through the Excelsior Tax Credit Program in exchange for job creation commitments. The company plans to invest \$1.2 million to grow its local operation. Monroe County and Greater Rochester Enterprise are also assisting with the project.

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3-D Digital Display Technology

Continued from Page 1

"Vision Engineering anticipates that this unique, first-to-market device will be particularly valuable to organizations that model and test components in 3-D, as well as facilitating improvements in manufacturing processes such as PCB inspection and reworking," said a company spokesperson. "DRV has the particular advantage for multi-site companies of offering real-time, full HD 3-D stereo images to multiple users in different locations at the same time (commonly known as 'daisy chaining')."

Manufacturing companies have tried to exploit the potential offered to them by consumer driven technological trends in Virtual Reality, Augmented

tances," said the spokesperson.

Using Vision Engineering's globally patented TriTeQ3 digital 3-D display technology, the DRV Z1 (Zoom model 1) incorporates a zoom microscope module and is the first device of its class to be launched by the manufacturer.

DRV Z1 is designed to advance the quality control and production process, by enabling operators to view magnified subjects in 3-D, in enhanced detail, without the need for additional viewing apparatus.

Mark Curtis, Managing Director of Vision Engineering, said, "DRV Z1 provides enhanced 3-D visualization and overcomes current problems with 3-D modelling and inspection systems. By amalgamating our existing tech-

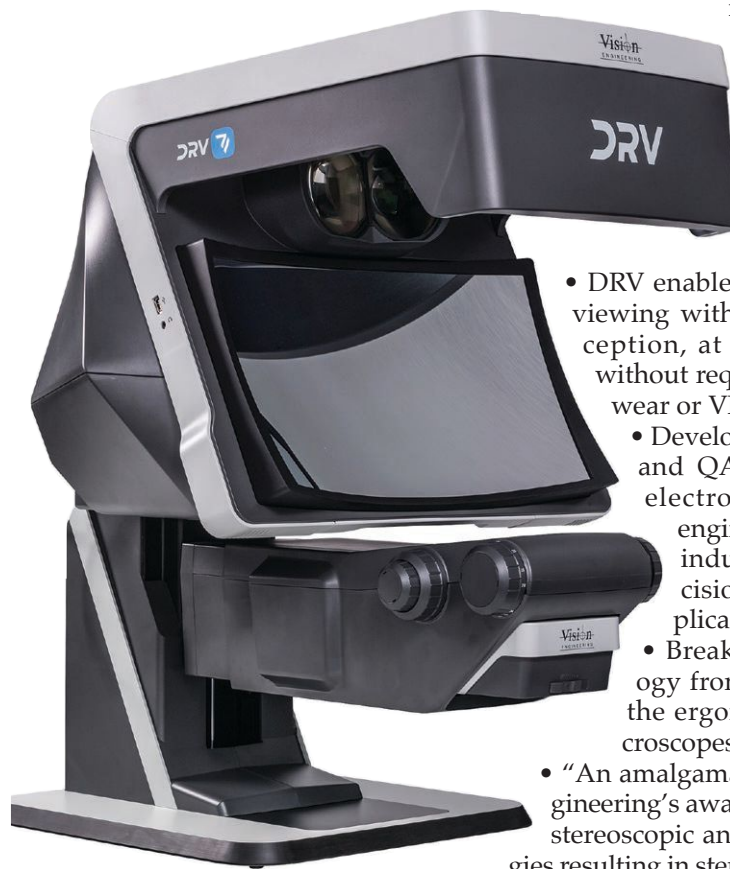
nologies, we have delivered an entirely new concept to our existing customer base, as well as opening up opportunities in fresh markets." Features include:

- DRV enables stereoscopic 3-D viewing with vivid depth perception, at UHD resolution, without requiring special eyewear or VR headsets
- Developed to address QC and QA requirements in electronics, automotive engineering, aerospace industries and all precision engineering applications
- Break-through technology from the inventors of the ergonomic Mantis microscopes
- "An amalgamation of Vision Engineering's award-winning optical stereoscopic and digital technologies resulting in stereo digital images," said a company spokesperson
- Ergonomic design reduces operator fatigue and promotes productivity and accuracy
- Enables remote viewing of dynamic 3-D images in in stereo full HD
- Enables improved accuracy in manufacturing processes such as deburring and reworking
- DRV Z1 is the first in series of innovative 3-D stereo full HD resolution viewing systems, based on Vision Engineering's patented TriTeQ³ technology.

The DRV Z1 will be launched in North America this month. Several launch sites have been selected and details of this launch will follow.

Vision TriTeQ is a division of Vision Engineering Group. Vision Engineering has been designing and manufacturing ergonomic microscopes, digital instruments, inspection and non-contact measuring systems for over 60 years.

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Reality and 3-D polarized/shutter glass viewing. Along with the advantages of these breakthrough technologies, they have experienced substantial drawbacks in sensory isolation, disorientation and resolution.

Modern manufacturing techniques involve multi-site communicability in real time. The latest trends of Artificial Intelligence and the Internet of Things and the cascade effect of Blockchain require information to be accessible to multiple users, at the same time, with the same fidelity.

Developed to address quality control and production requirements in sectors including electronics, aerospace, automotive and medical industries, DRV offers full, real-time transferability of information to multi-site manufacturers, designers or users of multi-tier development and logistic capabilities.

"DRV carries on the company's 60-year long tradition of creating ergonomic, high quality visual inspection and metrology systems that reduce operator fatigue and improve accuracy, consistency and productivity, but, critically, exploits modern digital capability to communicate across substantial dis-

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