IMTS 2014 PRODUCT PREVIEW

KLINGELNBERG

Booth N-6837

Klingelnberg will once again be exhibiting its grinding machines for bevel gears and cylindrical gears and its precision measuring technology at IMTS. Visitors to the event will be able to see four machines in action including:

Viper 500

The adaptable Höfler Viper 500 gear grinding machine is designed for component diameters of up to 500 mm, and is suited for both the smallest and the largest lot sizes. It is available in three different configurations, depending on your individual requirements: Profile grinding (Viper 500), small grinding wheels and multiple-wheel technology (Viper 500 K), and generation grinding (Viper 500 W). Users with frequent product changes in particular will find that the flexible machine concept provides an even more dynamic and efficient production process.

P-40

Klingelnberg will also be introducing the latest P-40 at the exhibition. Due to their comprehensive range of functions, the P series machines replace up to four conventional measuring devices. With its basic mechanical accuracy and a modern compensation strategy, the P-40 is a machine with long-term stability that is capable of performing high-speed

measurements in the highest accuracy class, directly on the shop floor. Features include an ergonomic operator panel, a vibration isolation function and an air-conditioned control unit.

G-60

The CNC-controlled Oerlikon G 60 bevel gear grinding machine from the G model series provides grinding performance combined with high-precision final machining of the curved-toothed bevel gears of any gearing system, including the teeth of face-type clutches. The G 60 operates up to a ring gear diameter of 600 mm. All G series spiral bevel gear grinding machines have a vertical grinding spindle, which ensures that the swarf drops directly downward. A special feature is that all drive units are above the grinding area, meaning that they are kept free of swarf deposits. The entire inner paneling is made of stainless steel – providing a clean and tough working area. All of the necessary additional components are integrated in the closed machine paneling. These are accessed through special maintenance doors. The adjusting work that is needed during re-tooling is assisted by convenient auxiliary functions like a standard semi-automatic grinding wheel changer, for example.

Helix 400

The Höfler Helix 400 gear grinding machine is a profile grinding machine for components with a diameter of up to 400 mm. Its well-engineered mechanical system makes it a reliable partner for sophisticated manufacturing. Apart from this, the innovative control and software functions make it suitable for customized profile and tooth trace modifications in special series production. The proprietary *GearPro* software guarantees ease of use, even for complex applications.

For more information:
Klingelnberg America, Inc.
Phone: (734) 470-6278
www.klingelnberg.com

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IMTS 2014 BOOTH # N-7046

STAR SU LLC

Booth N-6924

Star SU LLC will showcase the latest in linear motor technology offered by Star at IMTS 2014 in September. Engineered to manufacture complex cutting tools, the new Star NTG-4L tool and cutter grinder is a five axis, CNC controlled cutter grinder for manufacturing, sharpening and reconditioning a wide variety of cutting tools. The machine features include a mineral cast base for increased damping and thermal stability performance. All three axes are driven by linear motor technology, which eliminates almost all elasticity, backlash, friction effects, and drive chain vibration typically found in ball screw and belt driven designs. Both of the NTG rotary axes are have integrated torque motors for high and precise torques at optimal speeds. The machine is suitable for high mix, low volume jobs due to its quick setup and stability. For the high volume manufacturer, an optional robust automation package utilizes a Fanuc LR Mate robot allowing for an increase in productivity without sacrificing quality.

The G 250 from Samputensili will also be featured at IMTS. The G 250 is a generating and profile grinding machine, designed for cylindrical gears with a maximum outside diameter of 250 mm and shafts with lengths up to 550 mm. The machine is based on the dual work spindle concept, which eliminates non-productive times almost completely. By means of this feature, the loading/unloading process of a workpiece is carried out in masked time, while simultaneously the manufacturing process proceeds on another workpiece. Unlike other applications, the gear meshing is

conveniently carried out directly in the grinding position for better accuracy purposes and minimum changeover time. Indeed, only in this position the meshing can be achieved with micron-level accuracy. Therefore the G 250 represents a suitable solution for those customers who need very low cycle times and efficient mass production of gears. In the G 250 the minimum axis distance between worktable and grinding wheel is only 40 mm, and its grinding spindle can achieve 12.000 rpm. Due to the combination of these two unique features, the grinding process is also possible using profile/threaded grinding wheels with very small outside diameter, mounted on the main spindle. Workpieces with tool diameter limitations, for example shoulder-type gears, can be ground without

any additional devices. Similarly, double and triple pinions with very small distances can be ground with the proper tooth-to-tooth alignment. An add-on optional spindle multiplier up to 24.000 rpm, with quick connection system to the main spindle, allows the use of electroplated CBN profile grinding wheels with outside diameter down to 25 mm. The grinding spindle with its specifically large tool capacity allows the use of long grinding worms to raise the tool life of single or combination worms of roughing and finishing tools employing electroplated CBN or ceramic bound grinding worms and wheels. Therefore customers can always rely on the most efficient technology or the most beneficial combination to complete their grinding task.

For more information:
Star SU LLC
Phone: (847) 649-1450
www.star-su.com

GLEASON
Booth N-7000

Gleason will demonstrate advanced machines, tooling, and global customer support services at IMTS 2014, covering a wide array of processes for the complete production and inspection of all types of bevel and cylindrical gears. Visitors to Gleason Booth #N-7000 will be introduced to these products and technologies. Among the technologies exhibited at the show will be:

Genesis 200GX Threaded Wheel Grinding Machine: The 200GX is a new addition to the highly popular Genesis series. The two spindle concept combines maximum productivity with minimized idle and set up times. Fast, easy software-guided setup of the machine allows you to set up your machine from one workpiece to another in just 20 minutes using only one tool. "First Part Cycle" - fully automatic workflow after setup until grinding the first workpieces and the ability to interface with Gleason GMS machines via QR codes increase productivity. Easily accessible machine components make maintenance simple and efficient while standard dimension grinding wheels and dressing tools allow you to use your existing tools. All of this in an energy efficient small footprint machine designed to meet the needs of customers in high-productivity high-quality environments.

300PS Power Skiving Machine: The 300PS combines unique machine, cutting tool, workholding and power skiving process expertise to offer users significant performance improvements, particularly in operations where shaping, forming, pressing and broaching are typically used. As compared to shaping, for example, the 300PS can deliver productivity rates as much as eight times higher. The modular tool-less workholding is designed for fast installation and changeover to handle the highest process forces, with superior internal chip evacuation. Power Skiving Technology Software enables users to easily simulate the entire cutting process and plan the most effective process strategy. Users can analyze the influence of different cutting tool geometries and process parameters. The Technology Software allows you to decide if a given part can be safely and economically power skived or whether it would be better shaped, making Power Skiving as simple and familiar as shaping.

Phoenix 280G: This machine has no rails, wires, or pipes in the work chamber to collect swarf, keeping the chamber clean for low preventive maintenance. In addition, the 280G offers rapid set-up and all major set-up items can be completed without tools (tool-less), including the grinding wheel, coolant header and workholding. The coolant header has small blocks that can easily be exchanged by hand, while the grinding wheel can be released hydraulically. The 280G's automatic stock divider, mounted in close proximity to the workspindle, helps ensure consistently high gear quality. The unit automatically determines the tooth slot position of the pre-finished gear to provide accurate and reliable stock division, helping eliminate operator errors.

300GMS Analytical Gear Inspection Machine: The 300GMS was developed specifically to meet the needs of automotive transmission gear producers for a faster, more economical solution for complete gear and even non-gear parts inspection. It is the first GMS to feature the new Windows 7-based Gleason *GAMA 3.0* applications software suite which, like its *GAMA 2.0* predecessor, offers users a highly intuitive user interface and simple input screens for programming of workpiece and cutting tool data. The 300GMS is equipped with new ergonomically mounted operator workstations and a Gleason Diagnostic Module – both designed to greatly

improve the operator's effectiveness at every stage of the inspection process.

The Gleason Diagnostic Module puts a number of powerful tools right at the operator's fingertips, including an environmental monitoring station to record temperature and humidity, and video telephony, note pad and voice mail messaging capability, enabling the user to capture video, describe a particular programming issue and transmit it over the web to others in the customer's organization or to Gleason for support.

Additionally, the company will feature its gear cutting (Pentac Plus RT) and workholding solutions (Quik-Flex Plus) and attendees can learn about Gleason's new line of hydraulic workholding as well as its diverse range of global services.

For more information:
Gleason Corporation
Phone: (585) 473-1000
www.gleason.com

KAPP NILES
Booth N-7036

Two new Kapp Niles gear grinders and the latest portable gear inspection system from R&P Metrology GmbH will be introduced at Booth N-7036. The ZP 12 marries the best of the ZE and ZP series machines to offer a compact yet highly productive solution at a great value. The KX 260 Twin has extended the application range of the Twin series to include long shafts typical of truck transmissions. R&P's RPG PM 750/1250 is the first portable gear checker/CMM with dual functionality for use in the lab or on the production floor.

The new Kapp Niles ZP 12 provides the range to grind any gear diameter up to 1,250 mm with a fully dressed grinding wheel. The direct drive tool spindle has increased power, and the dual dressers shorten dressing time. Hob cutters and worms can now be ground and measured on this machine. The intuitive software is enhanced to speed the setup and optimize stock removal.

The new Kapp Niles KX 260 Twin is built on a shared modular platform with 500 mm axial travel. The machine includes two identical workpiece spindles, arranged at opposite sides of an indexing table for absolute shortest cycle times. A special feature of this machine is the process flexibility for profile and

generating grinding two gears on one shaft, in one cycle. Dressable or CBN plated wheels can profile grind up to module 10 (2.5 NDP) gears. Dressable worms grind gears up to 5 module. Kapp CBN plated worms are utilized for gears with constraints for normal grinding.

R&P Metrology's RPG PM 750/1250 is a flexible solution for measuring larger gears on production machines that may not have on-board inspection. The design makes it moveable within the plant. The optional "docking station" with granite base and rotary table allows the PM 750/1250 to become a standalone, fully featured four axis generative gear inspection machine when not required for portable measurement.

For more information:
Kapp Technologies
Phone: (303) 447-1130
www.kapp-usa.com

EMAG
Booth N-6846

At IMTS 2014, EMAG will feature manufacturing systems for precision metal components with multiple machines from its new modular standard VL and VT product families on display. These modular standard machines offer a systematic approach that is advantageous to establishing a highly efficient manufacturing process, with different operations offered on the same platform, allowing for easy interlinking and eliminating any great capital investment for automation.

The VL vertical pick-up lathe series opens up new opportunities for the machining of a wide range of chucked components. Small gearwheels, planetary gears, sun gears, sliding sleeves, synchronizer rings or flanged components, for example, can be machined with great efficiency. The smallest lathe of the VL product family, the VL 2, machines workpieces with a maximum diameter of four inches and a length up to six inches. Increasing in size, the VL 4, VL 6 and VL 8 offer a number of different turning and milling operations within the framework of a single closed-loop pro-

duction process. Specially designed for the handling of large components, the largest vertical turning machine of the series, the VL 8, is suitable for commercial vehicle production, handles workpieces up to 16 inches in diameter and 12 inches in length.

Built within the same modular concept is the VT-Series for machining large quantities of shaft components. With four axes, a self-loading turret and integrated automation, the VT 2-4 machines shafts with a max diameter of 2.5 inches and 16 inches in length. Spindle speeds of up to 6,000 rpm achieve extremely short cycle times as the shaft is clamped vertically between workspindle and tailstock and machined from two sides. The vertical alignment of the workpiece ensures process integrity, where the unhindered chip flow prevents the build-up of chip nests in the machining area.

Integrating the technologies of the EMAG Group into these new modular standards, the VLC 200 H will make its North American debut at IMTS 2014. The VLC 200 H hobbing machine integrates EMAG-Koepfer technology into the EMAG vertical platform, including the pick-up design, where the main spindle removes the raw part from the conveyor belt, transfers it to the tailstock flange and removes it from the machining area after the completion of the hobbing cycle. Gears with a maximum diameter of 8 inches and module 4 can be dry-milled at greatly shortened cycle times.

EMAG will also present its entire portfolio of production technologies, from turning, hobbing and grinding to those that complement traditional metalworking processes, such as its production laser welding, heat shrink technology and electro-chemical machining (ECM) capabilities. ECM processes offer non-contact machining with no heat affected zone or mechanical stress to components with no tool wear. An ECM machined blisk will also be on display.

For more information:
EMAG LLC
Phone: (248) 477-7440
www.emag.com

FELSOMAT
Booth N-7040

Felsomat Corporation will feature the latest gear honing technology at Booth N-7040. With the introduction of the Felsomat Power Speed Honing (Model FPSH) machine, they continue to redefine gear manufacturing technology. The FPSH 180 is specifically designed to be part of the Felsomat Flexline concept. The FPSH represents the highest performance and process stability achieved in the field of gear honing. The FPSH begins with the hobbing process performed by the FHC 180 hobbing machine. Next the integration of

the ALD SyncroTherm inline heat treatment process ensures reduced thermal distortion of the gears. This means that less stock needs to be removed from the gear flanks resulting in shorter gear honing cycle times. The FPSH can hone gears up to 160 mm diameter and module 0.5 – 4.0 mm. Stock removal between 40–80 microns on each flank is possible depending on the heat treatment deviation, and grinding burn is not a possibility due to the low cutting speed. In addition to the FPSH, Felsomat's Flexline integrates the entire gear manufacturing process into one uninterrupted chain and is comprised of the following machine/processes: Felsomat Turning Cell FTC 180, Flex Hobbing Center FHC 180, Flexline Integrated Heat Treatment and the Laser Welding Cell FLW 180.

For more information:
Felsomat Corporation
Phone: (847) 995-1086
www.felsomat.de

REISHAUER CORPORATION

Booth N-7040

The RZ260 features Reishauer's unique continuous generating gear grinding and is based on the RZ150 series. The RZ260 has not only been increased in size, all relevant components have been adapted to handle higher loads and forces that occur when grinding larger gears. Gears with an outside diameter of 260 mm and modules up to 5 mm can be ground with highest reliability in the well-known Reishauer quality. An important focus in the design of the machine concept was adaptability to the different production requirements of numerous customers. The machine can be fitted with one or two work spindles. The version with two work spindles is used to minimize the loading times – as introduced with the Reishauer RZ150. When investment and tooling costs must be minimized and/or the workpiece handling times are not critical, the RZ260 with a single work spindle might be a more suitable choice. When grinding gears with space limitations or small lot sizes, it might be advantageous to use the changeable profile grinding spindle enabling the use of a small plated or dressable wheel to grind gears using the discontinuous profile method. Both versions of the RZ260 can be equipped with a fixed or CNC-controlled axis for swiveling the dressing tool. With this option, the flexibility of the dressing tools can be increased since

the same tool can be used for a range of gears as compared to the fixed dresser where the tools are normally workpiece specific.

Also on display will be polish grinding on a beveloid gear used in a marine transmission. The grinding wheel has two different sectors and compositions; one area is used to grind and remove the heat treat distortion, and the other area is used to polish the tooth surface. This process achieves a surface finish of .07 micron. In addition to the improved surface, the polish ground process rounds out the edges at the transition of the workpiece flank and face. The topography of the flanks remains unchanged.

Like all Reishauer gear grinding machines, the RZ260 has been developed for the high demands of the continuous generating gear grinding process, also known as the Reishauer style. All design characteristics that lead to the success of other Reishauer machines have been incorporated in the RZ260. This includes the Reishauer Generating Module for highest gear quality, Reishauer LNS Low Noise Shifting technology for very low gear noise emissions, Polish Grinding for surface roughness reduction, Reishauer Twist Control Grinding technology to create defined values for flank twist and the Reishauer HMI for fast change over and set-up times.

For more information:
Reishauer Corporation
Phone: (847) 888-3828
www.reishauer-us.com

LIEBHERR GEAR TECHNOLOGY, INC.

Booth N-6930

With a one-table design and a new-design grinding head, the new Liebherr LGG 180 and LGG 280 machines greatly reduce grinding times for twist-free profile and generating grinding. The LGG180 will be demonstrated by Liebherr at IMTS 2014. The machines are designed to deliver consistent high large-scale production quality in automotive applications, including conical gearing. According to a Liebherr spokesman, "With this series of space-saving machines, vehicle manufacturers can develop a complete production line, in which all gearing components for a passenger vehicle transmission can be ground: planetary and sun gears, bore-type gears, as well as drive and pinion shafts with lengths up to 500 mm.

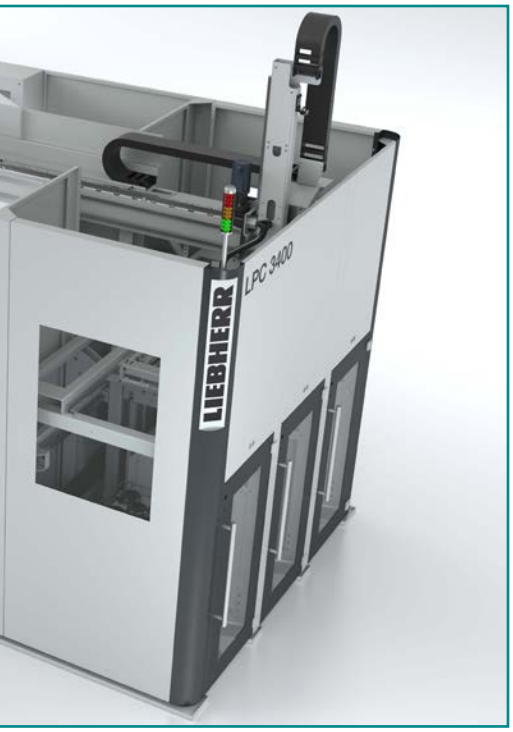
The advantage to the one-table solution is higher quality throughout the entire production. There is one clamping fixture, one geometry. Every machined part is manufactured under the same

conditions for the highest reproducibility. The one-table approach provides the statistical capability and reliability in continuously producing controlled µ-range finish quality for gear noise optimization. The new grinding head allows for rotation speeds up to 10,000 rpm and has spindle power of 35 kW. With this performance data, the head enables high cutting speeds and high feed rates. The new grinding machine can exploit the considerable potential of the innovative 3M abrasive Cubitron II. Changing the grinding arbor with HSK-C 100 tool holder is a fast and simple process. Also available is a second grinding head for featuring a small worm diameter for collision-critical parts.

The machine will enable undulations to be applied specifically to gear wheel flanks for noise optimization purposes for the first time. The ability to produce sub-µ range waviness cost-effectively gives designers a whole new range of optimization options. The touch screen user interface on the machine control permits easier, intuitive programming and machine operation and incorporates an integrated webcam. The control also can incorporate substantial additional documentation, such as fixture layouts and tool mounting instructions. The LGG machines are easily coupled with Liebherr automation solutions to create a fully automated production line for the highest quality gears in the least possible cycle times.

Additionally, Liebherr Automation will demonstrate a smart part handling solution that can remove randomly placed items from a container and place them accurately in a machine or production line, utilizing 3-D image recognition system software, a robot, and a sophisticated handling strategy. This intelligent removal of items, such as the automated picking of unsorted components, is referred to as random bin-picking. Specially developed grippers with additional axes enable collision-free access and the removal of items from the container, and subsequently allows for precise positioning of the item into a fixture or pallet.

The Liebherr custom bin-picking solution, designed for components weighing between 1 and 50 kilograms, deliver the potential for productivity and efficiency increases in a range of parts producing industries, including automotive, aerospace, general machining, and commercial vehicles. The company has developed process-reliable solutions that



achieve the cycle times and high availability rates manufacturers require.

The advantages of this scalable automation process include increased productivity, improved machine utilization rates, reduction of the need for additional machines to achieve desired plant production volumes, and more consistent production quality.

Liebherr has created complete systems for, among other sectors, for the automotive industry. This includes the efficient channeling of non-rotationally symmetrical components which arrive randomly in a bin and can be placed into production lines and hardening ovens. The beginning of a production line is the key point where picking from the bin is necessary.

An important breakthrough occurred with the object recognition system. The 3-D laser scanner precisely recognizes the components for picking. Outside light of any type in the production building has zero effect on the ability to pick a part. It will even recognize black, brown and rusty parts. The accompanying software segments identify and select information about items and constraints in the bin provided.

For more information:
Liebherr Gear Technology
Phone: (734) 429-7225
www.liebherr-us.com

MARPOSS CORP.

Booth E-5519

Marposs Corp. will introduce its new G25 gauging probe for contact scanning for pre- and post-process cycles on gear grinders and machining centers. Although the G25 device resembles a touch probe, it is actually a gauge with the ability to do both part surface scanning and perform touch functions for part positioning and measurement. The compact G25 device was developed to

gauge parts while still fixtured in the machine in case reworking is required. When used for gear grinding, the G25 gauge identifies the part location and tooth spacing for purposes of aligning the part with the grinding wheel prior to grinding. The same device is then used to scan the profile of the finished part in a continuous cycle. The new G25 gauging probe has excellent measurement stability at high speeds, enabling a significant reduction in inspection time compared to using a touch probe. Other applications to which the new G25 gauge is suited include grinding of non-round parts where the user needs to check certain characteristics of the part after it is ground, or for verifying that a face of the part is in the correct orientation. The G25 probe is available with either analog or digital output depending upon the user's requirements.

For more information:
Marposs Corporation
Phone: (248) 370-0404
www.marposs.com

ZOLLER
Booth W-2022

Zoller offers presetting, measuring, inspecting and managing of simple to complex tools for quality assurance, inspection of goods or extensive tool management tasks. "Not only measuring solutions, but also the use of cutting tools. The key to efficient tool usage and optimized tool life along with an economic manufacturing process leads to a professional tool management system. The still unknown and unused potential for cost savings in this area is enormous in many businesses," explains president and owner Alexander Zoller.

The well-established Bronze, Silver and Gold TMS Tool Management Solutions packages offer new functionalities such as a regrinding for the coordination of grinding cycles and incoming goods inspection. Experience the future of modern tool data management live at the booth: Tools can be downloaded from the Tooldata-Cloud, provided by major tool manufacturing companies and master tool data pools.

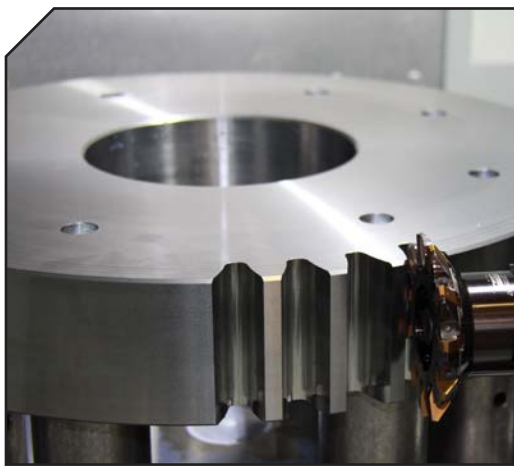
At IMTS, Zoller will present not only their universal inspection machines Genius and Smartcheck, but also new developments in the Pom series as well as the completely newly designed 3DCheck and their high-end Titan machine.

The 3DCheck is a new six-axis CNC-operated machine for the three-dimensional digitalization of workpieces. A target-performance comparison with a CAD model or a pre-scanned tool is now an easy and fast task. The compact tool inspection unit PomBasic for job-shop applications right next to the grinding machine is now also available with a high resolution camera for micron tools. Zoller's automation solution Roboset in combination with a CNC-operated tool presetter is of special interest to all companies with high tooling throughput levels such as tool manufacturing and grinding businesses, as well as in the quality assurance aspect. Roboset loads the Zoller presetter automatically and unmanned, 24 hours a day, 7 days a week.

For more information:
Zoller
Phone: (734) 332-4851
www.zoller-usa.com

DMG MORI
Booth S-8900

In the last two years, DMG Mori has expanded their gear milling portfolio to include more machine platforms that produce more types of gears. The highlight of the show will be the power skiving technology displayed on a multi-tasking machine platform that combines turning operations with milling operations and gear production. DMG Mori's

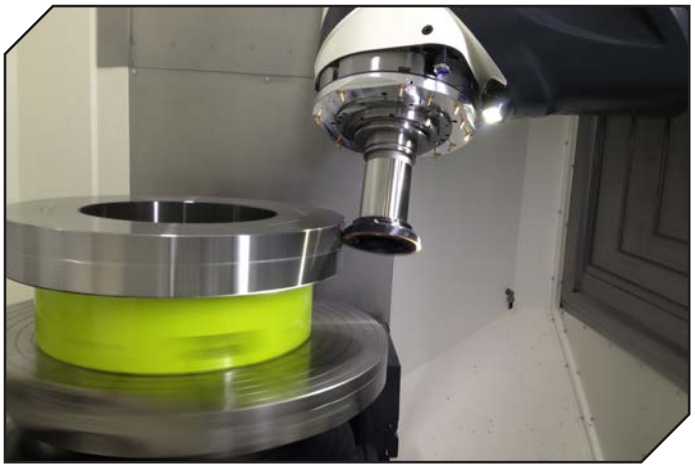


DMC 80 FD duoBLOCK machine will demonstrate machining of an ID gear using a power skiving process. As compared to conventional shaping processes, the power skiving process is a highly productive process for machining of ID and OD gears. The demonstration will show that the machine and process is suitable for even automotive volume production. The same machine will also demonstrate the machining of a spiral bevel gear using the flankmilling process. In addition, it will measure the spiral bevel gear using the onboard standard measurement probe and a point cloud generated by the DMG *gearMILL* software. Using the data gathered by the probe, the *Gear Pro* involute software from Zeiss will prepare the flank charts for the gear. This in-machine checking of gears is a unique feature and can be extremely useful for quick check measurement of large gears before removing them/unloading them from the machine. This feature is available for measurement of all types of gears.

DMG Mori is also launching its new horizontal machining center NHX 4000 2nd Generation. This machine provides a very cost effective way to produce large

diameter cylindrical gears. The super accurate B-axis (rotary table) ensures machining of excellent quality gears and a pallet changer (standard feature) eliminates the setup time altogether. The fast tool changes will reduce the cycle time and a large tool magazine will keep the machine running overnight. This machine will show a 19 in. diameter spur gear machined using the InvoMilling process and a 26 in. diameter herringbone gear machined using the flankmilling process.

In addition to this diverse gear portfolio, DMG Mori will demonstrate its technological expertise with their hybrid manufacturing machine. This machine combines the additive (3-D printing in metals) and subtractive processes into one machine to produce a finished part from just powder. It uses a powder spray technique that gives 20x to 40x deposition rates for depositing material and then conventional milling turning processes to remove material from any unwanted areas. The combination of these two processes on a single platform and the ability to execute them sequentially provides unparalleled freedom to design engineers – enabling them to design parts in ways they have not even imagined.



For more information:
DMG Mori
Phone: (847) 593-5400
www.dmgmoriseikiusa.com

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- ✓ **300GMS:** the complete gear inspection system for automotive, aerospace and similar sized gears.
- ✓ **Tooling solutions** for every gear production challenge.
- ✓ **Gleason 4.0:** our new 'smart factory' initiative.

See what the future holds at: www.gleason.com/IMTS.

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NORTON (SAINT-GOBAIN)

Booth N-7051

Norton will be exhibiting its Norton Vitrium^3, the next generation of bonded abrasives products, engineered for maximum performance and cost savings in precision grinding. Norton Vitrium^3 features a patent-pending

bond technology developed by the Saint-Gobain Abrasives R&D team. This bond features an exclusive chemistry that promotes excellent grain adhesion, resulting in improved product versatility across a wide range of applications. Substantial performance improvements with Norton Vitrium^3 are now attainable in all Norton abrasive grains, from proprietary Norton Quantum ceramic alumina to conventional aluminum oxide. Norton Vitrium^3 features a stronger bond construction that allows suitable form and corner holding for improved part quality and higher tolerances, reduced dressing time and wear, an improved holding power utilizing less bond-to-abrasive ratio and an increased porosity that improves coolant flow and chip clearance to eliminate burn or other part damage, especially on today's tough-to-grind materials, such as high nickel alloys, tool steels and chrome. "Whether the goal is to reduce total cost per part, increase throughput, or improve workpiece quality, Norton Vitrium^3 is re-shaping the world of precision grinding to meet these needs," said Scott Leonard, director of product management at Norton Saint-Gobain. "This new technology will allow significant increases in production and also introduces the possibility of grinding instead of conventional machining on some operations."

For more information:
Norton (Saint-Gobain)
Phone: (508) 795-2833
www.nortonabrasives.com

GMTA

Booth N-6670

German Machine Tools of America (GMTA) will be showing their complete family of gear-making machines, grinding, milling and turning centers, plus the newest additions to the line, Rosink parts washers and Arnold laser machines. Manning the booth will be President Walter Friedrich, VP Scott Knoy and executives from the various companies represented by GMTA in North America including Wera, Pittler, WMZ and Praewema, in addition to Rosink and Arnold. All are high-quality German machinery companies.

For more information:
GMTA
Phone: (248) 921-0122
www.gmtamerica.com

WENZEL AMERICA

Booth E-5698, N-6930, E-5510

Wenzel America's metrology expertise will be highlighted in three separate booths across two pavilions. Their cutting edge, 3-D Scanning CORE machine will be featured at their own booth in the QA pavilion. An XO CMM, featuring Wenzel's Phoenix structured light projection sensor will also be showcased. Wenzel's flagship, LH Generation CMM with standard Renishaw probe, will be on display at Renishaw's booth, also in the QA pavilion. Their newest WGT Gear Machines will be exhibited at Liebherr's booth in the Gear Generation Pavilion.

For more information:
Wenzel America, Ltd.
Phone: (248) 295-4300
www.wenzelamerica.com

KOEPFER AMERICA

Booth N-6918

Koepfer America, LLC will proudly introduce the CLC 200-SZ gear shaping machine at IMTS 2014. This machine will be the first of its model to meet the North American market, and it represents a competitive and fully customizable solution for high-precision, CNC gear shaping.

CLC has built gear shaping machines for gears up to 118" (3,000 mm) diameter; however, the CLC 200-SZ can cut external gears up to 7.874" (200 mm) diameter and has a maximum rating of 5 DP (mn 5.0). The machine will also demonstrate standard features such as a CNC electronic guide, stroking speed of 1,000 strokes per minute, a movable cutting head, and 3.937" (100 mm) stroke length. The machine can also cut internal gears up to 11.811" (300 mm) diameter.

CLC machines distinguish themselves with a rigid construction for cutting high-precision parts. These gear shapers can also be customized for a customer's specific application. For example, a tilting column can be provided for cutting tapered gears. Lastly, these machines utilize direct-drive torque motors, and, optionally, either Fanuc or Siemens CNC controls.

The CLC 200-SZ gear shaping machine will be Koepfer America's featured new product at the show, accompanied by a Koepfer Model 160 gear hobbing machine and a Wenzel WGT 400 gear inspection machine. This group of demonstration machines will represent Koepfer America's wide range of gear manufacturing products.

For more information:
Koepfer America LLC
Phone: (847) 931-4192
www.koepferamerica.com

EMUGE CORP.

Booth W-1536

At IMTS, Emuge Corp. will showcase their comprehensive line of clamping solutions. Emuge's workholding division specializes in providing highly accurate, almost maintenance-free customized solutions for applications from low volume job shops to high volume automotive production environments. "Our workholding group stays close to our customers to learn about their unique challenges and production environments. Doing so helps us develop the best solutions for their applications," said David Jones, precision workholding manager at Emuge Corp. The precision workholding lineup on display will include Emuge's System SG that is used in many machining operations such as hobbing, shaping, and shaving for gear production, as well as milling and inspection. The System SG's large surface area contact with the workpiece provides a clamping solution which is very rigid, accurate and repeatable. The high precision System SP is used not only to clamp workpieces but also to clamp tools. By applying an axial force, the clamping sleeves move in the direction of the force and expand radially. This eliminates the clearance between clamping sleeve and body, and between clamping sleeve and workpiece. System SP achieves concentricity of ≤ 0.002 mm (corresponding to ≤ 0.0001 inch).

For workpieces that have a short clamping base or for diameters with a very large tolerance, System SZ is an option. By applying an axial force, a slitted collet is radially expanded by a cone. Simultaneously an axial movement occurs, clamping the workpiece. When the eccentricity between pitch circle and seating bore is very small, diaphragm clamping System SM is suitable. It allows clamping of the gear wheel at the pitch circle for machining the seating bore. The gear wheel is clamped in both axial and radial directions. System SH is a solution if there is not enough room for a mechanical clamping system and for clamping long, thin-walled workpieces or a number of similar workpieces. System SH is a closed system which uses hydraulic pressure to clamp the workpieces.

For more information:
Emuge Corp.
Phone: (800) 323-3013
www.emuge.com

ZEISS INDUSTRIAL METROLOGY

Booth E-5504

Zeiss Industrial Metrology is introducing the latest generation of the successful Zeiss Contura. This system provides a platform for flexible, reliable quality assurance. It is even more precise than its predecessor and offers a large package of optical sensors on top of additional measuring ranges. *Zeiss Calypso 2014* software and a highly tuned overall system enable Zeiss Contura to maintain a high standard in the industry. The Contura has made high-performance measuring technology available to the masses. The latest generation will continue on this proven path. A reliable measuring system is the result of the interaction of its components: design, sensors, software and service. "With Zeiss Contura, customers receive a well-balanced system and thus a guarantee for stable, reproducible precision. Put simply: results you can rely on," says Andrzej Grzesiak from Zeiss Industrial Metrology business group. Thanks to its robust design, Zeiss Contura can also be used near production. The latest and most powerful scanning sensors from Zeiss are available for the machine. Another new feature is the range of measuring volumes. The Zeiss Contura family has eight different sizes starting with a measuring volume of $700 \times 700 \times 600$ mm up to $1200 \times 2400 \times 1000$ mm.

For more information:
Zeiss Industrial Metrology
Phone: (800) 327-9735
www.zeiss.com/metrology

DONTYNE GEARS

Booth N-6778

Dontyne Gears is a newly formed company set up to help in the development of gear systems. DG naturally uses the versatility of Dontyne Systems software to optimize design for production and performance, but also has access to the highest level of small and large volume machining equipment to produce such components. These components can be inspected on high quality gear inspection equipment and tested in test rigs ranging up to 160 mm centers. Proximity and collaborative links to Design Unit and Offshore Renewable Energy Catapult (formerly NaREC) in the North East of England ensure a solid knowledge base for R&D projects of the highest caliber and the possibility of larger scale development programs. DG will help define and implement a test program for standard gearing and custom gear forms. The company will also consider collaborations with machine tool manufacturers and tooling companies in the development of equipment and processes using various production methods and materials. IMTS is a chance to get to know the personnel and discuss potential collaboration.

For more information:
Dontyne Gears
namerica@dontynesystems.com
www.dontynesystems.com

FIXTUREWORKS

Booth W-1686

Fixtureworks, a supplier of workholding and machine tool components, fixturing accessories and material handling products will showcase its extensive product lineup during IMTS 2014, Featured in the exhibit will be Fairlane Products full line of fixturing accessories including grippers, rest pads, Swivots swivel/pivoting positioning components, Quick Release ball-lock pins, rollers and bumpers. Included in the Fairlane Products lineup are the new Urethane Covered Bearing Rollers. These covered bearings have a smooth urethane surface that is cast directly to a precision sealed ball bearing. They provide smooth, quiet and non-marring operation with excellent abrasion resistance and durability. They are available with hardness ranging from 35 to 95 durometer in 1'to 3' diameters.

The exhibit will also feature the company's full lineup of manual clamps from Imao, OK-Vise and Mitee-Bite. Clamps that provide quick and secure fastening for repetitive machining operations and are suitable for easy load/unload of workpieces. The clamps come in a variety of sizes from heavy-duty to mini, clamping-force options from as little as 2 to over 2,200 lb. and configurations that include swing, pull, snap, hook, toe and side.

In addition, also on exhibit will be Kipp spring plungers, rest and riser pads, levers, handles, knobs, and hand wheels; Imao supports and stops, risers, T-nuts, sliding mounts, springs, supports, grid plates and blocks; OK-Vise single and double wedge clamp designs; Mitee-Bite low-profile edge clamps; and Modern Industries mPower product line which includes quick change precision locating and mounting systems and modular tooling, plates and columns.

For more information:
FixtureWorks
Phone: (888) 794-8687
www.fixtureworks.net

HAAS AUTOMATION

Booth S-8119

Five-axis machining is an effective means to reduce setups and increase accuracy for multi-sided and complex parts. Machining those parts quickly further increases throughput and improves the bottom line. The UMC-750SS universal machining center from Haas Automation, Inc., is a high-speed solution for quickly machining 5-sided (3+2) and simultaneous 5-axis parts.

The UMC-750SS is a 5-axis, 40-taper universal machining center with 30" × 20" × 20" travels, 1,200 ipm rapids, and an integrated high-speed, dual-axis trunnion table. The machine is equipped with a 15,000-rpm inline direct-drive spindle, a high-speed 40+1 tool side-mount tool changer, and Haas Automation's powerful high-speed machining software.

The UMC-750SS's high-speed, roller-cam trunnion table offers 150 deg/sec feedrates to quickly position parts to nearly any angle for 5-sided (3+2) machining, or provide full simultaneous 5-axis motion for contouring and complex machining. The trunnion provides +110 and -35 degrees of tilt and 360 degrees of rotation for excellent tool clearance and large part capacity, and the 630 × 500 mm table features standard T-slots and a precision pilot bore for fixturing versatility. To simplify job set up, the UMC-750SS features Dynamic Work Offsets and Tool Center Point Control, and comes standard with Haas Automation's Wireless Intuitive Probing System.

The machine's 15,000-rpm inline direct-drive spindle is powered by a

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30-horsepower vector drive system that yields 90 ft-lb of cutting torque. The Haas inline system couples the spindle directly to the motor to reduce heat, increase power transmission, and provide excellent surface finishes.

A wide selection of high-productivity options is available for the UMC-750SS, as well, including a belt-type chip conveyor, high-pressure through-spindle coolant systems, expanded program memory, and much more.

For more information:
Haas Automation
Phone: (805) 278-1800
www.haascnc.com

SANDVIK COROMANT

Booth W-1500

Cutting tool and tooling systems supplier Sandvik Coromant has announced that leading CAD/CAM software companies Edgecam, Top Solid and GibbsCAM are integrating the Adveon Tool Library. Built into software, Adveon helps customers to further improve machining productivity and security, and saves time during machine setup. By reducing the engineer's input, both consistency and quality of data are improved. Additional CAD/CAM companies are in the process of integrating Adveon as well.

The library has standardized methodology, designed specifically to facilitate quick and safe CAM programming. Adveon allows users to: develop their own tool library/database, select tools for production, overview and maintain the assortment, build tool assemblies quickly and safely, see immediate results in 2-D and 3-D models and instantly export to CAM or simulation software.

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

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

According to CAM system suppliers, the automated input of cutting tool data to CNC systems can increase the productivity of a machining process by as much as 20 percent.

Klas Forsström president of Sandvik Coromant comments: "Pressure to reduce time from design to production combined with the ever-increasing complexity of tools makes rapid access to accurate and current tool data more critical than ever. Companies can no longer afford to rely on manual data entry and operators need a single tool library that can manage tools from multiple manufacturers. Adveon has been designed from the 'ground up' to address these challenges and we are pleased that the leading CAD/CAM companies have integrated the tool library system."

Additionally, Sandvik Coromant will display its InvoMilling technology at IMTS as well as its patented Inveio technology featured in its newest inserts. Products featured include the CoroMill 172, Capto MACU, CoroCut QD SL, CoroDrill R846 and more.

For more information:
Sandvik Coromant
Phone: (800) 726-3845
www.sandvik.coromant.com

HWACHEON MACHINERY

Booth S-8129

Hwacheon Machinery America will demonstrate its high-precision machining centers for die-mold applications. Hwacheon's Sirius range of 3-axis vertical machining centers feature 20,000-rpm high-speed spindles for the UM and UL+ models and 12,000 rpm spindle for the UX model.

A number of useful options make mold-die machining more efficient with Sirius machines. Equipped with integral motor spindles with jacket cooling and oil-jet cooled bearings and rigid roller linear guide ways, the machines deliver stable performance over long cycles. According to the company, the Sirius range of high speed die and mold machining centers provide the industry high capability, extreme precision at an attractive price.

The UM model demonstrated at Hwacheon's open house featured a 850 mm (33.46") × 500 mm (19.70") work table with 800 kg (1,764 lb) load capacity, strokes of (X, Y, Z) of 750 mm (29.53") × 500 mm (19.70") × 450 mm (17.72"), and rapid positioning of 24 m/min. The 40-taper (BBT & HSK optional) tools are changed in 2.5 seconds.

The bilateral gate structure in Sirius-UM effectively distributes the vibration, weight, and heat throughout the entire frame. Finite element analysis methods help to minimize the frame distortion which may be caused by machining conditions or environment. The distance between the spindle and the body is designed short, so the machine stays stable after a prolonged operation.

The spindle is integrated with the motor to limit vibration, noise, and power loss at high speed rotation. The cooled jets of oil are injected directly onto the spindle bearing for effective cooling, and the motor and the spindle assembly are jacket-cooled to limit the displacement caused by heat. To achieve greater precision, standard Hwacheon software (*HSDC*) monitors the spindle for possible thermal displacement and makes necessary adjustment in real time.

Sirius-UM provides powerful feed performance using the Z-axis 6-block LM guide. The servo motor is coupled directly to the drive; and while the tensile preload ball screws provide smooth operation, the roller linear guide allows for rapid feed and rigid performance.

Before final finish passes, Sirius machines can, with Hwacheon HFDC (Hwacheon frame displacement control system) software, dynamically compensate for any changes that may have occurred in machine kinematics due to temperature, vibration or changes in the tool itself.

Hwacheon mold-making machine tools feature standard integrated software developed in conjunction with Fanuc CNC for thermal displacement control and compensation. Software measures thermal conditions in the machine during the cycle and uses the information collected to dynamically verify and control accuracy.

In this way, Hwacheon machine can control the kinematics of the machines for contour machining, optimizing machine performance for roughing, semifinish, and finish machining without employing a number of different programs. The Sirius machines include software that other machines do not or offer only as options.

HTLD Tool Load Detection software provides real time measurement of tool load ensuring consistent and safe machining. Constantly monitoring tool damage and deterioration for prevention of complete tool failure causing work piece damage, this software ensures accuracy and performance. Such a system will measures tool load very frequently, such as every 8 msecs.

Hwacheon high efficiency contour control (HECC) system offers an easy to use programming interface system which provides a precise, custom contour control for the selected work piece while supporting longer machine life and reduced process time. Such software will offer different options for cutting speed and accuracy, and for surface finish and geometry. A customizable display provides real time monitoring and easy access. This software may be used with existing NC systems and is compatible with G-Code programming.

Optima, a cutting feed optimization routine utilizes an adaptive control method to regulate the feedrate in real time to sustain a consistent cutting load while machining. As a result, cutting tools are less prone to damage and machining time is reduced. The system controls the feed velocity to maintain consistent cutting load. Features include a graphic display of tool load and feedrate, convenient operation using G-code programming, and a number of data sets for specific tool and process control. Additionally, highly sensitive thermal sensors mounted at various locations in the machine castings where thermal displacement is possible can permit software monitoring and correction of detected thermal displacement.

Hwacheon spindle displacement control (HSDC) is also possible with software. As a spindle rotates at high speed centrifugal forces and heat expand the spindle taper causing error in Z-axis. This axis accuracy is vital to precision mating of die components. In addition to a high precision cooled spindle, software can be used to constantly monitor temperature at a number of points within the spindle assembly predicting thermal displacement. The system can then makes necessary adjustments and effectively minimize thermal displacement, preventing Z-axis error due to taper expansion as the spindle rotates at high speed.

For more information:
Hwacheon Machine Tools
Phone: (847) 573-0100
www.hwacheon.com

EXSYS

Booth W-1671

Exsys Tool, Inc. will exhibit a wide range of innovative manufacturing technology. Among the products on display will be the Preci-Flex modular quick-change tooling system, the compact Eppinger C3, C4 and C5 Connection Base Holder, Deco-Flex modular adapters for Swiss automatic machine tools, and modular Gressel vises. The company will also highlight its comprehensive Exsys Tool Repair LLC. service that specializes in repairing and rebuilding driven tooling for CNC turning centers.

The Preci-Flex modular quick-change tooling system features a selection of adapters engineered to hold different cutting tool and shank designs. The adapters' common connecting feature locks into a standard base unit on the machine turret, enabling tool/adapter assemblies to be preset offline then quickly switch in and out of the base unit. Tool positions repeat within +/- 3 µm, eliminating the need to re-center, touch off, or make test cuts.

The Preci-Flex conical and flat-face planar interface duplicates the taper of the standard ER collet, enabling ER collets, albeit at lesser repeatability, to be used along with Preci-Flex adapters to mount collets, endmill holders, expanding collet chucks and shrink fit tooling on a single base holder. Operated at the front face of the turret, the connector provides two tons of clamping force, and its compact design maximizes torque transmission and rigidity, increasing accuracy and productivity.

Representing another example of advanced modular quick-change tooling technology, the compact Eppinger C3, C4 and C5 Connection Base Holder makes fast and simple tool changes possible as well as requires minimal space within a machine tool so it can easily handle larger workpieces.

For Swiss automatic machine tools, Exsys Tool will exhibit Deco-Flex adapters that have minimal envelope dimensions so they can increase manufacturing flexibility in a Swiss machine environment. The compact design also enhances rigidity, boosting machining efficiency.

The Deco-Flex connection features a conical and flat-face planar interface that ensures concentricity and repeatability. The system also offers specific adapters that combine with fixed and/or rotary tool holders to optimize tool performance and flexibility. Tools can be preset off the machine, allowing adapter/tool changes to be completed in seconds and thereby reducing setup times while increasing machine uptime.

On the workholding side, at IMTS, Exsys will present three innovative workpiece clamping systems from Gressel:

•Gripos modular machine vises clamp by tension rather than compression, producing no deflection of the vise baseplate, and are gradually and precisely adjustable from 10 to 100 percent gripping force. Turning a lever 160 degrees provides mechanical amplification with complete clamping in less than a second, minimizing set-up times.

- Grepos 5-axis power vises feature the same actuation technology as GRIPOS vises and provide force amplification from 0-40 kN direct on the workpiece. The design of the vise permits access to the both sides as well as the underside of a part, facilitating true 5-axis complete/simultaneous machining.
- Solinos modular single-clamping vises for small workpieces feature interchangeable jaws and are offered in mechanical or hydraulic versions, providing clamping force up to 20 kN. Clamping range is adjustable without jaw removal, enabling quick change-overs between different parts. The vises can be directly integrated into pallets.

For more information:
Exsys Tool, Inc.
Phone: (800) 397-9748
www.exsys-tool.com

POLYGON SOLUTIONS INC.

Booth W-1954

Polygon Solutions' latest rotary broach product not only expands their tooling product line, but it also brings an innovative solution to manufacturers hoping to capitalize on the 'Made in USA' re-shoring trend. Polygon Solution Inc.'s new 'Made in USA' broach is a rotary broach with multiple text letters allowing machinists to stamp or mark their part in a lathe or milling machine without removing the part from the machine. Polygon's rotary broaching system is usually used for making hexagon or square holes in precision machined products. The new 'Made in USA' broach will have its official debut at IMTS.

Polygon Solutions first introduced an innovative and award winning adjustment free Rotary Broach Tool Holder in 2010, ideal for CNC machines because of maintenance free sealed bearings and a new pressure relief system. The company later announced a series of letter broaches in 2012. The broaches have letters or numbers and are inserted into Polygon's broach holder to mark parts. The different identifying marks improve quality to distinguish between mixed lots of parts made in the same machines.

The 'Made in USA' broach was first tested during Polygon's annual National Association of Manufacturers (NAM) Manufacturing Day tour in 2013. Lee Virtual School students in Fort Myers, Florida were taught about product development and how the new rotary broach 'wobbles' or displaces material to create the text. Polygon showcases new products to students in hopes of promoting the desire for STEM education in a new generation of engineers and machinists.

"Made in America is one of the strongest selling points we have, even for our U.S. Customers," says Matt Chambers of Marine Concepts in Cape Coral, Florida."The quality of the overseas product has been from the start an inferior product, and as the cost of quality is more than ever being taken into account, not only are we sought after for quality but our total cost for our customer is less." Marine Concepts and Polygon Solutions Inc. actively work together as members of the Florida's Southwest Regional Manufacturing Association (SRMA).

Polygon's new broach is not limited to the 'Made in USA' mark. The company sells its tools worldwide and is also developing the system to mark logos, slogans and symbols. "We've had a few challenges to get it to work perfectly," says Peter Bagwell, product engineer at Polygon. "But we keep working with our customers and our partners to get it right. Customers re-shoring their parts want to show they are now made in the United States."

Partners include the Precision Machined Product Association and National Tooling & Machining Association. Bagwell adds, "We've learned from our customers that our rotary broach holder is very easy to set up in the machine and very easy to use for making small hexagon and square holes. We hope the new 'Made in USA' broach helps them achieve an even higher level of satisfaction in both their parts and ours."

For more information:
Polygon Solutions
Phone: (239) 628-4800
www.polygonsolutions.com

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