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Just the Facts

September 6–13, 2006

McCormick Place, Chicago, IL

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- Metal Cutting
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- Quality Assurance
- Tooling and Workholding Systems



Hours:

Lakeside Center: 9:00 a.m.–5:00 p.m.

North & South Buildings: 10:00 a.m.–6:00 p.m.

Sunday, September 10, hours for all buildings

will be 10:00 a.m.–4:00 p.m.

Nachi to Feature Gear Machines, Tooling, Robots and Materials

Booth B-7021

Nachi Fujikoshi Co. will display a number of gear machine tools at its booth at IMTS 2006, including machines from its Japanese partner companies—Kashifuji, Kanzaki and OSK. Nachi represents all three companies in North America, and in Japan, Nachi, Kashifuji and Kanzaki form the Gear Production Alliance.

Visitors will be able to see the Kashifuji KN151 hard hobbing machine, which is designed for hobbing gears both before and after heat treating. The machine is especially suitable for the production of gears that are difficult to grind, says Toru Inoue, VP of Nachi America





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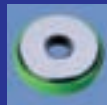


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IMTS NEWS

Inc. Example parts include pinion gears for electric power steering.

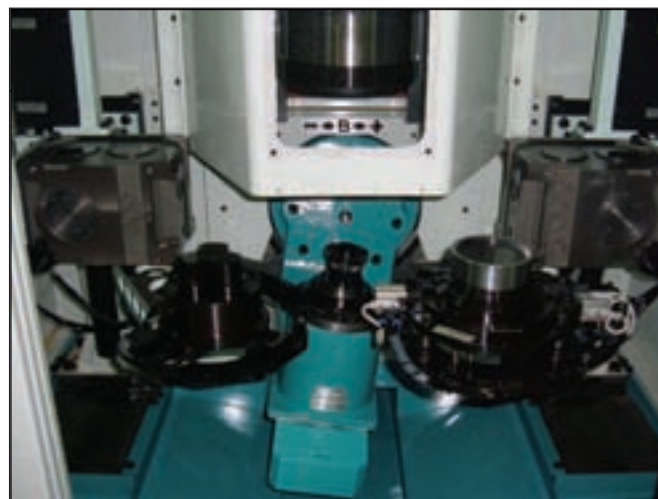
The KN151 was first introduced in 2002, but it has been updated with an index table for hard hobbing, Inoue says.

Also on display will be the Kanzaki GSU-180-NC3 internal shaving machine. Unveiled for the first time in North America, the machine uses a shaving cutter with an axial cutting angle to process spur and helical gears with internal teeth. The machine offers advantages over broaching processes, Inoue says, because it is capable of producing tooth surface corrections, such as crowning and taper. These corrections are important to many manufacturers, he adds, because they help reduce noise.

"We think internal shaving is good for hybrid transmissions," Inoue says.

The company will also display the CLP35 inspection machine from OSK. The CLP35 was introduced in 2005, but it will be on display at IMTS for the first time.

Nachi will feature three of its machines, including the NBM-50087 semi-dry broaching machine, the PFM-610E semi-dry roll forming machine, and the Hi-5010 hard



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broaching machine. The Hi-5010 has been on the market for several years, but it will be displayed at IMTS for the first time this year, Inoue says. The Hi-5010 is capable of broaching hardened parts up to 60 HRC using broaches made out of carbide materials and coated with heat- and wear-resistant coatings. The Hi-5010 is capable of cutting speeds up to 80 m/min with a maximum stroke of 1,000 mm and maximum pulling force of 50 kN.

All of Nachi's machines are capable of using a high-speed, minimum-quantity-lubricant system.

Nachi will also display its line of cutting tools, including hobs and broaches for cutting gears in both green and hardened states. In addition, visitors will be able to watch Nachi robots in action as well as see displays of Nachi's capabilities in bearings, hydraulics and materials for applications such as hot forging dies.

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Reishauer To Display New Hard Gear Finishing Technology at IMTS

Booth B-7005

Reishauer will display the RZ 400 precision gear grinding machine at its IMTS booth.

According to the company's press release, the RZ 400 incorporates a gearless planetary drive, acoustic sensing for alignment of dressing diamonds and LNS low noise shifting, which produces a random surface structure on the teeth to

prevent excitation. All of the features have been recently patented.

The machine working area was designed to facilitate fast changeovers. Additional features include a convenient location for the setup of the dressing unit, ergonomic ease of wheel change and almost unlimited restriction of the gear location on the shaft or arbor, allowing the machine to achieve maximum uptime. The main column that carries the grinding spindle and slide rotates 90° to perform the wheel dressing operation.

Gear profile modifications can be realized with a few keystrokes and do not require special diamond discs due to the new line dressing feature. Using the machine axis, the wheel is moved during the dressing cycle to produce root, flank and tip modifications that will be imparted to the gear during grinding.

A key component of the machine that will be on display is the Felsomat Compact Cell FZ 250 machine tool loader. The cell is designed for loading precision parts into high production machine tools. Parts are organized in stacks of steel or plastic baskets and processed using horizontal and vertical NC axes.

The compact cell de-couples individual processes. Each machine and cell has an optimum buffer of parts which provides significant machine autonomy with minimal operator attendance. In addition, the cell facilitates system designs that are inherently scalable and easily optimized.

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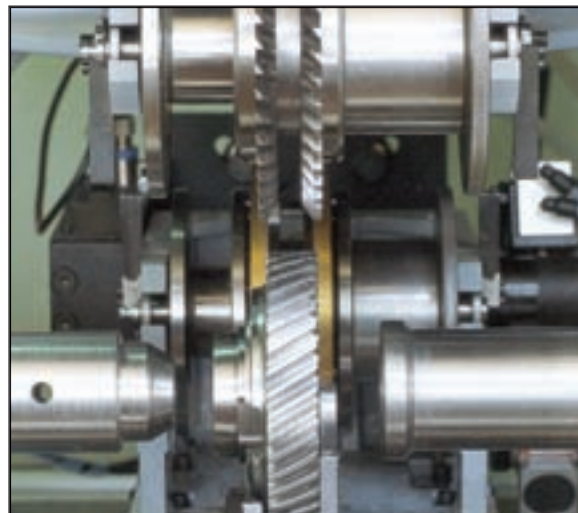
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Star SU Brings Mass Production Machines to North American Market

Booth B-6912



Star SU plans to introduce the S 250 CDA stand-alone chamfering and deburring machine at its booth at IMTS. The machine, intended for use in mass production, uses an automatic loading system with an integrated gantry loader. It was introduced to the European community earlier this year and is now ready for the North American market.

The machine will be exhibited with a creative automation conveyor feeding the machine-integrated pick-and-place device, and it will be set up with SU chamfer/deburr tools. The company says chamfering and deburring an automotive pinion has a floor-to-floor cycle time of 14 seconds with this type of setup.

According to company literature, the product's workpiece outside diameter ranges from 20–250 mm. The workpiece's maximum width is 150 mm, and its maximum module is 8 mm. The two tool-headed machine has a PLC control.

The S 250 CDA is part of Star SU's new S-CD series of machines. The company already introduced the S 250 CD, a series of stand-alone machines for flexible production of small to medium lots with manual loading capabilities.

The S 250 CDX is a module that can be integrated onto a hobbing machine for mass producing gears of 200–300 mm. The S 250 CDX includes simultaneous or consecutive chamfering/deburring of shafts with a maximum of five different gears or a family of different ring gears and pinions with the same clamping system.

The S 250 CDP, currently under development, includes the same features as the S 250 CDA, but with a pass-through

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Additional features of the entire machine family include a new electro-welded bed with chip gathering under the work area; process flexibility and security with dry or wet machining; modularity between models to offer a range from simple, basic machines to extensive, complete solutions; and modular standard automation, allowing for easier setup and connection to existing or new machine tools.

The company also plans to include the Star PTG-1 and PTG-4 hob sharpening and reconditioning machines. The PTG-1 sharpens both straight and spiral gash hobs. Additionally, the PTG-1 sharpens disk and helical shaper cutters and various round tools.

A customer-owned Bourn & Koch Fellows MS450-125 will be at the Star SU booth as well. The CNC guide machine



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Also on display will be the Bourn & Koch Blanchard 11AD-20 rotary surface grinder, previously from the old DeVlieg Bullard company, and the Bourn & Koch 100H horizontal CNC hobbing machine, a six-axis machine featuring NUM 1050H six-axis CNC control, full machine enclosure for wet or dry hobbing, pneumatic live center, automatic single- or double-cut hobbing on multiple gears or splines, automatic shift hobbing, speed and feed change between cuts, crown hobbing, taper hobbing, radial or tangential feed worm gear cycles, and CNC hob swivel. Bourn & Koch will demonstrate multiple spline hobbing on a shaft with two splines having different numbers of teeth, with two hobs with different numbers of starts, dry cutting in a single clamping, as well as single-axis milling.

For more information:

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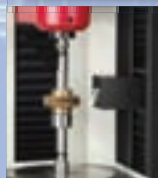
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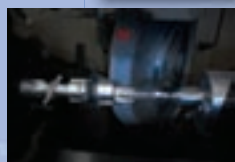
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Kapp and Niles to Highlight Gear Grinders' On-Board Measuring and Ring Loader Automation

Booth B-7030

The Kapp Group will feature at IMTS a technology transfer involving a popular Kapp gear grinder and Niles' ZE 400S (extended stroke) gear grinder.

The ZE 400S will simulate profile grinding of internal gears. However, the machine's on-board measuring and inspection will be demonstrated for real, with contact between workpiece gears and probe.

"The machine will actually demonstrate gear measuring," says Bill Miller, newly appointed vice president of sales for Kapp Technologies, the North American operation of the Kapp Group.

The ZE 400 can measure lead, involute, and index on internal and external gears in accord with AGMA standards, DIN standards or customer specifications, such as via K charts. The measuring is done with a Renishaw touch probe,

which isn't sensitive to temperature, Miller says, so it doesn't require frequent recalibration due to temperature variations.

Also, the ZE 400 can perform on-board dressing of its grinding wheels. The on-board measuring and dressing are transferred Kapp features, and together, they allow the correction of the tooth form in a semi-automated process that Kapp calls GMG (grind-measure-grind) technology.

"It doesn't require the typical trip to the gear lab with the component," Miller says of the on-board measuring and correcting. "The most important feature is the higher productivity for larger gears."

Kapp will display its KX 300 P, too. The popular profile and generating grinder features on-board measuring and inspection and on-board dressing of its grinding wheels and worms. Also, the machine will be set up for simulated grinding cycles and for demonstration of a working, integrated ring loader system.


"It's coming as a turnkey solution from Kapp," Miller says. "It's designed to be very easy to set up, so it can be used for smaller lot sizes."

However, Miller says automation, like the ring loader system, is usually for large production, such as in the automotive industry. He adds that the ring loader system is Kapp's first to be integrated within the machine enclosure.

"It's designed as a CNC axis," Miller says of the system. "The CNC axis enables the loading to be faster, more precise and easier to set up, so it can be efficient for batch lot production also."

Kapp and Niles personnel will be available to discuss the new ZX series, too. A gear grinder in that series is the ZX 1000, which was introduced in June in Düsseldorf at the German show METAV (Manufacturing Technology and






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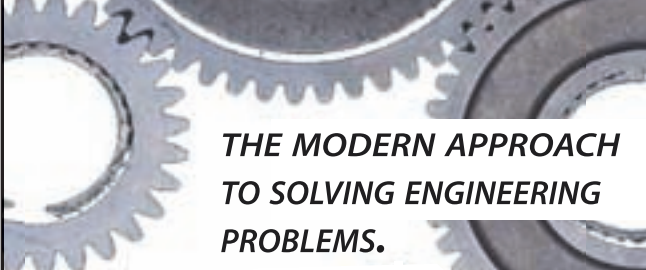
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Automation). Miller describes the ZX series as an extension of KX 300 P: "The ZX is an extension of that line to a larger platform."

As of early August, Kapp had delivered its first ZX 1000 to a company in the printing press industry.

Kapp and Niles will also display scale models of other machines and processes, such as the VUS 55 P and the CX 250. Miller says these models enable more efficient explanation of various processes available from Kapp and Niles.

The VUS 55 P form grinds external and internal spur and helical gears and uses either CBN or dressable grinding wheels. The CX 250 finishes external spur and helical gear flanks via Kapp's Coroning® process.

The VUS 55 P also performs on-board gear measuring, facilitating automatic documentation of the amount of stock removed from each gear tooth flank.

"Several of our customers have an interest in controlling the case depth of every single tooth," Miller says. He adds this interest exists when the gears will be heavily loaded in high-duty applications, such as in a city bus. He also cites aerospace as another application in which gears may be high duty and heavily loaded.

In such instances, inspection of each flank can be necessary, Miller says, because: "The case depth is so critical to the design integrity."

Also, on-board inspection allows gear inspectors to avoid problems that can result when matching a gear's in-lab orientation with its on-machine orientation.

Miller says the Kapp and Niles products coming to IMTS signify a continued sharing and integration of key technologies, yielding benefits for Kapp's customers.

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Gleason Unveils New Threaded Wheel Grinder

Booth B-6902

The new Genesis 130TWG High Speed Threaded Wheel Grinder from Gleason Corp. features a design that improves cycle times for the grinding of hardened spur and helical gears. The machine is designed to accommodate gears with diameters as large as 130 mm.



The 130 TWG was manufactured at Gleason-Hurth in Munich, Germany, and uses dressable grinding wheels, which can be dressed using either diamond-plated master dressing gears or standard dressing tools. According to Gleason, utilizing the master dressing gear method results in faster dressing, which is independent of the number of starts of the grinding wheel, particularly in high production applications. A fully automatic dressing unit with conventional dressing technology is used when greater flexibility is needed.

A new mechanical double gripper loader is fully integrated into the machine. According to the company's press release, this reduces part load/unload times. A rapid automatic stock dividing system automatically positions the workpiece in relation to the grinding wheel. No manual adjustment is necessary.

Direct-drive spindle motors are utilized as well. Higher acceleration/deceleration rates and increased torque combine with faster axis motions to reduce non-grinding time.

Additional features include a service module that consolidates hydraulics, lubrication and pneumatics into one location. Siemens controls combine with proprietary software for setup and operation control in a Windows environment. In addition, the machine frame is designed such that the coolant pump can be set up on either side or on the rear of the machine for connection to the coolant system. Gleason says this satisfies any cell/system arrangement.

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Sigma Pool to Feature In-Process Gaging, Speed in New Hobber, and Gear Measuring

Booth B-7016

A Sigma Pool partner, the Liebherr Group will introduce at IMTS its new LC 60 CNC gear hobbing machine, a smaller hobber that features maximum hob and table speeds of 7,500 rpm and 1,400 rpm, respectively, as well as simplified automatic counterbearings for faster tool changeover.

Moreover, the LC 60's spindle and table speeds are high enough to permit full use of twist-free hobs, which were developed by Liebherr and LMT-Fette. The finishing hobs can remove twist (also called profile bias) from crowned helical gears. According to Peter Kozma, president of the U.S.-based operation Liebherr Gear Technology Inc., the spindle and table speeds also permit use of hobs with high-starts for reducing cutting time.

Kozma adds that with the simplified automatic counterbearings for cutting tools: "You can do a significantly faster cutting tool change."

The LC 60 occupies about 20% less floor space than the LC 80 and can hob gears with maximum outside diameters of 60 mm (2.4 in.) and maximum modules of 2.25 mm. The new hobber was designed to be highly reliable, with minimum maintenance requirements, and to be suitable for job shops, dedicated gear shops, and plants that mass produce automatic transmission gears.

"They all want to make the gears as quickly and accurately as possible," Kozma says.

He adds that workpiece exchange time, from the end of cutting one gear to the start of cutting another, can be as little as 3 seconds. The LC 60 has a fully covered work area for optimal chip flow during dry cutting, too.

Also, Liebherr will demonstrate a pick-and-place loading system that features a gripper with an integrated gage for in-process measuring of part diameters. Specifically, the gage



measures the diameters of the crankshaft main bearing and pin bearing surfaces to make certain they're machined to their correct dimensions. Kozma says that the gripper/gage system can also be attached to gantry loading systems.

He adds that the gripper/gage system would also be suitable for placement in a gear manufacturing cell, between a turning center and a hobber, so workpieces could be measured while moving between the machines, to ensure the parts were turned properly: "The measurement is taken during the transfer to the next machine station."

Kozma adds that the gage is accurate to 0.001 mm, and its purpose is to reduce the number of scrap gears in an automated manufacturing system.

"We automatically check every part," he says, mentioning engine parts and transmission parts as examples. "Gear and shaft manufacturers can benefit from the integrated gage in the part handling."

Kozma says that with the gripper/gage system, manufacturers could avoid having a separate station for measuring turned parts and could move their parts faster through their manufacturing processes: "You can really reduce cost by gaging in the gripping."

About the pick-and-place loading system, Kozma says it can be used in either job shops or dedicated shops. "Our customers are looking for highly reliable automation systems."

Sigma Pool partner KlingelInberg GmbH will display its P 26 gear measuring center.

The CNC machine can measure cylindrical gears with external and internal teeth, worms and worm gears, spiral bevel gears, rotors, camshafts and other cylindrical workpieces. The P 26 measures gears with outside diameters of up to 260 mm.

Also, measuring programs are available for the most important gear cutting tools, such as hobs and shaper and shaving cutters.

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Koepfer to Display Hobbers and Gear Inspection Machines

Booth B-6907

Koepfer America LLC will display four machines at IMTS: 1.) its Model 300 CNC hobber, 2.) Wenzel GearTec's Smart Gear inspection and CMM machine, 3.) Wenzel's WGT350 gear inspection machine, and 4.) Monnier + Zahner's Model MZ130 CNC fine-pitch hobber.

Koepfer's Model 300 is a nine-axis, heavy-duty machine able to hob gears with maximum modules of 4 mm.

The CNC hobber can also skive gears and perform diagonal hobbing. Moreover, it has a timing-to-part feature. Gimpert says this feature allows the Model 300 to easily perform difficult operations, such as aligning a gear tooth to a hole or slot in a helical steering pinion.

The Model 300 features direct-driven workpiece and cutter spindles. The workpiece spindle has a maximum speed of 800 rpm, while the cutter spindle's speed ranges from 200–2,000 rpm or alternatively from 400–4,000 rpm.

"It can fit in either a contract shop or a dedicated application," Gimpert says about the Model 300's flexibility.

Wenzel's Smart Gear machine, introduced in 2005, can perform four-axis measuring of internal and external spur gears, helical gears and splines, as well as worms and worm gears.

The machine can inspect gears with a minimum module of 0.4 mm, a maximum outside diameter of 270 mm and a maximum face width of 300 mm. It can also perform 3-D measurement and inspect tools such as hobs and shaping and shaving cutters and other special tools, like stick blades. Moreover, the machine can be equipped to perform CMM work.

Gimpert says the Smart Gear is "ideally suited for a job shop that needs a more economical gear inspection machine or a combination machine with gear and CMM capability."

The other Wenzel gear inspection machine on display will be the WGT350. This machine's four axes, including its rotary axis, have air bearings. Gimpert says the bearings allow for greater accuracy than mechanical bearings and: "The accuracy of the air bearing doesn't deteriorate over time."

The WGT350 uses Renishaw scanning probes to inspect gears with outside diameters of 5–400 mm and modules of 0.5–15 mm.

The WGT 350 can include software for measuring external and internal spur gears, helical gears and splines; worms and worm wheels; straight and spiral bevel gears; hobs; shaper cutters; shaver cutters; and cylindrical shafts. The machine can also use coordinate measuring software for 3-D measuring.

Koepfer will also exhibit Monnier + Zahner's Model



MZ130 gear hobber and worm milling machine.

The MZ130 makes external spur and helical gears, worms and worm wheels, splines and threads. It can accommodate workpieces with outside diameters of 2–55 mm, can hob gears with modules up to 1.25 mm and mill worms with modules up to 2.0 mm.

The MZ130 was designed to be easy to reset from gear hobbing to worm milling and to be suitable for making small or large quantities.

Gimpert describes the MZ130's driven and synchronized tailstock as a unique feature, as providing a more rigid clamping of smaller gears as they can be driven by both the workpiece spindle and tailstock simultaneously.

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