Gear Chamfering Robot

Banyan Global Technologies Gear Chamfering Robot (GCR) is the newest generation of machines developed to deburr, chamfer or radius the edges of large wind energy slew bearing ring gears. Conventional chamfering occupies significant floor space and requires that large, heavy ring gears be moved onto the machine bed for deburring, a dangerous and time consuming task that requires a skilled operator to “dial-in” the gear position on the rotary table. The Banyan GCR (less than 250 lbs. can be moved into place on the ring gear using a small overhead crane, chainfall or forklift. With a self-locating drive pinion and locking cylinders, there’s no need to indicate anything.

“Our gear crawler operates by moving a lighter weight machine tool to the heavier parts instead of moving heavier parts to an even heavier machine,” says Darryl Witte, vice president, Midwest Region. “Through self developed onboard intelligence, our crawler will monitor and position a cutting tool to the part form and will debur any form within the range of the tool. It can operate with parts set on the floor and does not require a large ring to be indicated and adjusted central to a rotary table.”

The machine finds its own location on the gear and drives around the ring with no user intervention. Banyan’s internally developed machine motion controller maintains a constant cutting pressure regardless of tooth geometry, functions with either internal or external gearing, spur or helical forms and ensures a smooth surface finish and consistent cut. Special coated carbide chamfering tools are available in both solid and indexable configurations.

“Operation cannot be easier,” Witte says. “We have an onboard touch screen that requires four pieces of gear data and three inputs for cutting parameters that can be either input directly to the control or uploaded from a wireless data point. The machine can even operate via web connection through smart phone technology.”

Features on the GCR include program-less operation requiring a minimum number of users, a three hp spindle with vector drive control for precise machine motion and a complete machine cycle that does not require user intervention. The six-inch graphic display touch screen for programming and diagnostic display is user-friendly and includes onboard memory to recall hundreds of chamfering configurations, a multi-axis servo control for machine movement and function, a high precision/low backlash drive transmission and an optional automated Z-axis (spindle height) for multiple pass chamfer depth requirements. Wired and wireless communication is available for remote status, service and diagnostics. A two-color stack light (red/green) is also available for quick status check of operation.

“We have had nothing but positive reaction to this technology,” Witte notes. “The most common comments point to the benefit of the flexibility and ease of programming, in addition to the benefit of the flexibility and ease of programming, in addition continued
to the cost savings over fixed machinery that consumes floor space.”

The GCR includes one set of spindle tool holding collets, collet wrenches and tools, removable safety covers for easy service, an operators manual, electric wiring diagrams and a spare parts list. Lift bars for easy movement and positioning of machine for use, storage or service are also included. “The crawler comes complete, less tooling and drive gears as they are specific to the parts to be cut. We provide a one-year warranty of functionality based on single shift usage,” Witte says.

Additionally, the GCR can add features such as zoned composite gear inspection, automatic z height adjustment and tooling choices that change the chamfer into a filleted roundover if desired. “The current base model is built for spur form ring gears and we are entertaining quotes for helical applications that require a tilting axis for the cutting tool spindle.”

Banyan Global Technologies is a sales and engineering company specializing in the manufacture and implementation of custom designed tooling and machining solutions for major market industries worldwide, including but not limited to the aerospace, agricultural, automotive, compressor, medical, military, marine, mining, off-road, and wind energy markets.

In addition to the GCR, Banyan offers a variety of tools for gear gashing, spline milling, rack milling, skiving, shaping, indexable inserts, slitting saws, bevel gearing, indexable hobbing and reconditioning.

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**Gleason’s 350GMS**

**OFFERS FASTER CYCLE TIMES AND MENU-DRIVEN INTERFACE**

Complete inspection of gears as large as 350 mm in diameter now can be performed up to 40 percent faster (gear design dependant) with the introduction of the Gleason 350GMS Analytical Gear Inspection System, one of a new generation of analytical inspection systems from Gleason Metrology Systems Corporation. Among the new design features now available on the 350GMS is the GAMA 2.0 Windows “object oriented” applications software suite, which offers users faster cycle times and a menu-driven human/machine interface that simplifies day-to-day operation.

GAMA operating software offers a simple, highly intuitive graphical user interface (GUI). The time it takes to create new part inspection programs and conduct a complete analytical inspection of even the most complex bevel and cylindrical gears is reduced, according to the company. In addition, GAMA is a true Windows based application, making it fully compatible with the latest LAN and WAN networks, so users can easily interface inspection results with their gear design and production resources for corrective actions downstream.

The 350GMS is also equipped with the Renishaw SP80H 3-D scanning probe, available with various stylus sizes, configurations and extension lengths. The Renishaw probe provides a high speed, high accuracy measurement capability to 2-D probe systems used by other gear inspection machines. With a solid granite base, Meehanite cast-iron slide assemblies, linear drive motors and large-diameter heavy duty rotary table, the 350GMS is also designed and built to deliver accuracy and reliability. The 350GMS has a new operator control panel and remote control with new features and enhanced functionality to improve day-to-day operation.

The 350GMS joins the recently-introduced 1000GMS with these new features and capabilities. Gleason Metrology Systems also offers customers throughout the world’s gear production industries a host of other products including functional gages, composite gage systems, software, automation, calibration and other services, and the western hemisphere’s only A2LA gear lab.

For more information:
Gleason Metrology Systems
300 Progress Road
Dayton, OH 45449
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www.gleason.com

**CoroMill 325**

ENSURES FASTER/ACCURATE THREAD WHIRLING
Sandvik Coromant recently announced the introduction of its CoroMill 325 thread whirling inserts and holders. These tools address the growing demand for techniques that produce threads fast and at high tolerances, arising from the special thread forms used for medical bone screws, implants and other microcomponents. Thread whirling is a fast and accurate way to thread long, slender components in difficult-to-machine materials. By combining the speed of thread whirling with the rigidity of a sliding head machine, complete threads are produced accurately in a single pass, without the need for special supports. CoroMill 325 thread whirling inserts and holders can produce a wide range of high precision screws and implants from rough stock at high speeds and fit a large number of sliding head machine types. For many manufacturers, this can eliminate the need for a dedicated thread whirling machine. Thread whirling provides a number of advantages over traditional single-point threading, including increased productivity, faster set up times, no extra costs for finishing treatment, suitable chip control and increased tool life over conventional tools.

For more information:
Sandvik Coromant
1702 Nevins Road
Fair Lawn, NJ 07410
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www.coromant.sandvik.com

Luren Precision Co., Ltd., founded in Hsinchu, Taiwan in 1994, has been dedicated in gear technology including the design and manufacture of hobs and shaving cutters. Owing to its own capabilities in software design and machine tool building, Luren manu-

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factures 800 hobs and 500 shaving cutters monthly with its key customers in Taiwan, Japan, Korea, China, Germany and the United States.

During the past decade, Luren also developed other gear-related business sectors like CNC grinding machine tools. A CNC hob sharpening machine was developed first, followed by a CNC worm and thread grinding machine and a CNC gear profile grinding machine (horizontal). The latest development from Luren is a vertical CNC gear profile grinding machine capable of grinding gears of 800 mm in diameter with features of automatic stock dividing, onboard inspection and rotary dressing. In total, more than 100 CNC grinding machines were ordered and shipped to date.

Additionally, the company manufactures spinning pumps and oil finish pumps used in man-made fiber production, especially for polyester and nylon filament yarns or staple fibers. Luren also manufactures driven tool holders for a CNC turning center. Both VDI and BMT types are currently under development. Strict tests in noise level, temperature increase and vibration are performed for quality assurance.

After the establishment of two sales offices in Osaka, Japan in 2004, and Shanghai, China in 2008, the third overseas sales office was opened in Chicago in July, 2010. Gerald Kuo was appointed as general manager. The function of this sales office is mainly in supporting and reinforcing Luren’s existing distributors of gear cutters, CNC grinding machines and spinning pumps in North America.

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Luren Precision Co., Ltd.
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Phone: (847) 598-3555
www.luren.com.tw
Milling Cutter

DESIGNED SPECIFICALLY FOR MACHINING TITANIUM

ATI Stellram recently introduced a new chevron-style milling cutter, the Stellram 5230VS12, designed specifically for machining titanium and other difficult to machine materials, such as nickel-based alloys and cobalt-based alloys. In comparison studies, the Stellram 5230VS12 cutter achieved metal removal rates up to two times greater than comparable cutters on the market, according to the company’s press release. This is vital in aerospace applications where part design often calls for up to 80 percent metal removal. The 5230VS12 chevron cutter positions multiple inserts along the cutting edge of each helical flute. This advanced design of the insert placement provides smooth, progressive penetration and cutting action for extended tool life, lower power consumption and up to a 30 percent improvement in surface finish. Cutters range from 2.5 inches to 4.0 inches in diameter, with four to six flutes. Depending on flute length, from six to 14 inserts can be positioned along each flute. Individual coolant jets to each insert provide constant chip evacuation and temperature stability in the cutting zone. The Stellram 5230VS12 cutter represents a combination of advanced tool design and high technology insert grades, resulting in a tool capable of substantially increased productivity and surface finish quality.

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Big Kaiser has recently introduced the Mega ER Grip, a new premium ER collet chuck system featuring a runout accuracy of .00012” (three microns) at 5xD. The Mega ER Grip was designed to outperform all other ER systems in the four most crucial areas of tool holder performance: clamping force, concentricity, rigidity and balance at high spindle speeds. These factors, combined with the system’s reliable and stable runout accuracy, amount to significant long-term savings. A major design improvement increases the contact length of the internal taper of the chuck body, reducing the undesired overhang of the collet for significant performance enhancements. “Our tests have shown that Mega ER Grip performs exceedingly well in these four areas,” says Jack Burley, Big Kaiser vice president of sales and engineering. “The result is cost and down-time reduction thanks to longer tool life. Customers will also see improvements in machining quality and shorter production times because of reduced cutting vibrations.”

For more information:
Big Kaiser
2600 Huntington Blvd.
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Phone: (847) 228-7660
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Wireless Handwheel

ALLOWS FREE MOVEMENT IN WORKING SPACE

Heidenhain recently released an electronic wireless handwheel for use on machine tools. Especially useful on large machine tools, this cordless HR 550 FS handwheel allows the user to concentrate entirely on the action in the machine’s working space by enabling remote control datum setting and probing with free and unrestricted movement around the machine. This also offers the user a safer environment as it eliminates the risk of getting caught in handwheel cables. Used in conjunction with the Heidenhain iTNC 530 control, this HR 550 FS communicates with its base via a 2.4 GHz ISM radio band, freely accessible worldwide. The “FS” stands for functional safety, meaning the handwheel corresponds to the valid requirements for safety such as an emergency stop button and permissive buttons. If the machine operator moves out of range, it reacts with a vibration alarm. The colored and raised axis keys of the HR 550 FS permit traverse of up to six NC axes. In addition, the machine manufacturer can configure an axis key for selection of the so-called “virtual tool axis.” The handwheel display itself consists of a header and six status lines. It displays important machine conditions and information (e.g., position of the selected axis, spindle speed, feed rate, error messages, active basic rotation and tilted working plane) as well as the functions of the five soft keys, which the machine integrator can assign as desired. In addition, the machine tool integrator can freely assign specific functions to the six function keys featuring LED indicators. The symbols for the axis des-
ignations and the function keys can be exchanged. In the version with mechanical detent, the traverse per stop can be set. The HR 550 FS also has a docking station features an integrated battery charger.

For more information:
Heidenhain Corporation
333 State Parkway
Schaumburg, IL 60173
Phone: (847) 490-1191
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Suburban Tool, Inc. has released their newest product offering, the Master Height line of height gages. This height gage is available in three different sizes (450, 600 and 1,000 mm) and two different repeatability/error ranges, the Magna (M designator) with magnetic scales and the Ultra (U designator) with glass scales. The Master Height line offers a soft-touch keyboard, swivel adjustment and user-friendly graphics, both USB and RS232 ports for data transfer to PC or printer, motorized and manual movements with rapid jog, air bearing cushion with built-in air pump, multiple reference points, optional printer attachment, millimeter/inch conversion feature, SPC capabilities, 1000-
Tracer Products has introduced the Tracerline Marksman ultrasonic diagnostic tool, a highly accurate instrument that converts and amplifies inaudible ultrasonic sound into audible “natural” sound. Now, service technicians can easily hear sounds that signify problems such as air brake leaks, gear and bearing wear, as well as vacuum, EVAP system, exhaust refrigerant and passenger compartment leaks. The Marksman uses a two-tiered process to ensure accurate diagnosis. First, the receiver unit converts inaudible sound into audible sound using a process known as heterodyning. Then, the receiver’s Sound Signal Technology fine-tunes the audible sound into the natural sound emitted by the defect itself. A 10-bar LED display indicates the intensity of incoming signals from the problem source to ensure error-free diagnosis.

The Marksman Master Kit comes with a receiver, full-sized headphones, step memory and 2-D capabilities. The Master Height can also be used as a “go/no go” gage and can provide a quick manual squareness measurement. The Master Height gage is CE approved.

For more information:
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tools@subtool.com
www.subtool.com

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**Marksman Diagnostic Tool**

**CONVERTS ULTRASONIC INTO AUDIBLE SOUND**

Tracer Products has introduced the Tracerline Marksman ultrasonic diagnostic tool, a highly accurate instrument that converts and amplifies inaudible ultrasonic sound into audible “natural” sound. Now, service technicians can easily hear sounds that signify problems such as air brake leaks, gear and bearing wear, as well as vacuum, EVAP system, exhaust refrigerant and passenger compartment leaks. The Marksman uses a two-tiered process to ensure accurate diagnosis. First, the receiver unit converts inaudible sound into audible sound using a process known as heterodyning. Then, the receiver’s Sound Signal Technology fine-tunes the audible sound into the natural sound emitted by the defect itself. A 10-bar LED display indicates the intensity of incoming signals from the problem source to ensure error-free diagnosis.

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two anodized probes and an ultrasonic emitter that allows technicians to test for faulty seals, gaskets and weather stripping in passenger compartments, trailer bodies and other unpressurized enclosures. When attached to the receiver, the 12-inch hollow probe accentuates air sounds, while the solid contact probe accentuates sounds of wear or grinding inside gears. Standard nine-volt batteries are included for both the receiver and the emitter. All components are packed in a sturdy storage case with foam insert.

For more information:
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Emuge
INTRODUCES NEW SERIES OF END MILLS

Emuge Corp. has announced the introduction of TiNox-Cut, a new series of end mills specifically developed to provide tool life when machining challenging materials. TiNox-Cut End Mills offer a cutting solution for nickel alloys like Inconel and Stellite, all grades of titanium and tough stainless steels like Super Duplex—materials used extensively in the aerospace, power generation, medical, chemical and food industries, among others.

“The demand for parts and components machined from these materials is on the rise, but the same special properties, like high heat, chemical and abrasion resistance, that make these materials desirable for use in extreme-service applications, also make them difficult to machine,” says Stephen Jean, milling products manager, Emuge Corp. “Typically, these
materials burn up cutting tools. Now, with TiNox-Cut End Mills, Emuge has something to combat this.”

The new TiNox-Cut End Mills feature a high heat-resistant, lubricious coating and an optimized cutting edge design. This provides long tool life by minimizing friction and efficiently evacuating chips, which is especially important in tough, long-chipping materials. In addition, the tools are made from an extra-tough carbide grade to maximize wear resistance.

For maximum effective cutting lengths, TiNox-Cut End Mills feature reduced neck diameters. Offering machining repeatability and safety, the new end mills combine a tight, h5 shank tolerance with a specially roughened surface finish to maximize tool holder clamping potential.

The TiNox-Cut End Mills are well suited for both roughing and finishing operations. The tools consist of three designs: two four-flute variations for both roughing and finishing and a five-flute extra long finishing tool.

TiNox-Cut roughing/finishing end mills are available with flat ends or with a selection of corner radii. For even more efficient chip evacuation, TiNox four-flute end mills are available with internal coolant/lubricant capability. The roughing/finishing versions are available with a serrated profile for effective chip breaking during roughing operations.

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The 30-minute Tru Temp low temp black oxide process is now available in a new zero-discharge configuration that eliminates the need for a drain connection. This new Tru Temp system from Birchwood Casey utilizes ion exchange technology to purify and

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recycle the rinse waters, resulting in a “closed-loop” zero-discharge installation. The technology is available for all size systems, including 40-gallon, 100-gallon and larger capacity custom tank systems. “Ion Exchange equipped Tru Temp systems work well in those installations where it is impossible, or impractical, to send process rinse waters to the drain,” says Mark Ruhland, vice president of Birchwood Casey. “In facilities with septic systems, or in plant locations inconvenient to city drain connections, the ion exchange system allows the process line to operate as a self-contained system. By recycling the rinse waters, the need for a drain connection and discharge permit is eliminated.”

The primary benefit of the Ion Exchange equipped Tru Temp system is that the process tanks can be physically disconnected from the drain. The Ion Exchange system removes all particulates and dissolved ions from the rinse waters, generating de-ionized water that is reused over and over. The user gets ultra clean rinse tanks, no discharge to the drain, and near zero water consumption. The Tru Temp process is a suitable in-house substitute for the dangerous 290 degrees F hot oxide process. Operating at only 200 degrees F, the Tru Temp system avoids the severe hazards of a boiling tank and is safe to install in any area of the plant. Now with the new Ion Exchange feature, a Tru Temp installation is practical for any location without sewer district restriction. With a fast 30-minute blackening time, Tru Temp forms a durable, black magnetite finish of .000020 inch thickness equal to that of hot black oxide. The in-house process streamlines part movement, provides better control of finished part inventory, and enhances ISO accountability. Most important, it gives the user a “same-day turnaround” capability to satisfy key customers and fill rush orders—without raising finished inventory levels.

Satisfying Mil Spec DTL 13924D and AMS 2485, the Tru Temp process contains no EPA regulated metals. When a city sewer connection is conveniently located, the process rinse waters are normally sewerable as non-hazardous discharge, without waste treatment. For those installations that require zero-discharge from the system, the Ion Exchange option will sat-
Indian Technology and Manufacturing Companies (ITAMCO) recently released two manufacturing applications to assist those involved in the gear industry. The first is a Metal Weight Calculator; it can calculate the weight of various types of metals in all shapes and sizes. The second is a Thermal Expansion Calculator; it can calculate the change in dimensions of a given material when it is heated or cooled. These new applications join earlier ITAMCO releases including a Hardness Conversion application, GearWare, an application that converts different pitch sizes and Feed Rate Calculator, an application that simply calculates feed rates and speeds for the machinist. All of ITAMCO’s applications are free and available at the iTunes website at http://itunes.apple.com/us/app/metal-weight-calculator/id404879293?mt=8 and http://itunes.apple.com/us/app/thermal-expansion-calculator/id408896437?mt=8

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