

Gear Chamfering Robot

SUITABLE FOR SLEW BEARING RING GEARS

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 deburr 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,



The Gear Chamfering Robot from Banyan Technologies is suitable to deburr, chamfer or radius the edges of slew bearing ring gears (courtesy of Banyan).

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

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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 appli-

cation, 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.

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