

Custom Gear Cycle Times

Plummet with Help from Reishauer, Siemens

Custom Gear and Machine, Inc., of Roscoe, IL, recently purchased a Reishauer RZ400 gear grinder and, on one job, has seen the cycle time drop from 40 minutes to six minutes, according to Tim Rose, vice president of manufacturing, who runs the business with co-owners Dave Patterson and Mike Rasmann.

Rose explains, "We were looking to expand our gear grinding capability and the Reishauer RZ400 offered us many benefits, including 400 mm O.D., 10 mm root diameter, up to 999 teeth capability, helix angles to ± 45 degrees and a z-axis of 300 mm, all features we could use on a daily basis. We also liked the easy access four-door configuration and serial interface, plus the machine's auto wheel dress-



Custom Gear and Machine's new Reishauer RZ-400 helps them cut cycles times to a fraction of what they were using an older machine.

er and add-ons of materials and part handling devices."

Custom Gear and Machine, Inc. was already running an older Reishauer grinder, but the company was seeking to improve its throughput and overall grinding department performance. The RZ400 has three features that helped achieve these goals. The machine has more than double the surface speed, going from 1,900 rpm to 4,000 rpm. It also has a seven-start grinding wheel versus a single-start variety. Also, the flushing and grinding integrity were significantly improved from the older machine with coolant pressure increasing from 30 psi to 300 psi.

Custom Gear and Machine, Inc., founded in 1994, is a full-

service gear manufacturer, producing spur and helical gears to AGMA 8 thru 14 standards and up to 30" diameters typically, plus splined shafts to 54" in length. Its customers include builders of agricultural equipment, construction and off-road vehicles, machine tools, printing presses, food processing equipment, overhead cranes, materials handling devices, lift equipment, process equipment such as large water pumps and more.

Dennis Richmond, vice president for Reishauer, handles North American sales and service for the Swiss-based machine builder. Richmond says, "Our previous gear grinders at Custom only allowed them a 13" diameter, and they were looking to step up to a larger, 16" max

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Siemens controls allow a customized user interface.

diameter. Plus, they were seeking other features we were able to offer. We use the Siemens numerical controls on our machines for a variety of reasons, especially the architecture's ability to allow our engineers to customize the front ends. This simplifies the addition of new part programs and helps operators more easily navigate the programming and set-up. When the data input is completed for the current screen, for example, the operator is prompted to enter data for the next screen and so on, until the program is completed."

Rose confirmed this point, adding that Custom Gear's machinists are each responsible for the set-up, running and maintenance of their machine. "They take a real pride in making sure the jobs are done right and that the machine is always in great shape."

One of the current machinists running the Reishauer RZ400, Daniel Warren, noted that he had not previously run a machine with a Sinumerik CNC from Siemens onboard, but explained, "I got great training from Reishauer and was up to speed very quickly. We were making parts within a few days after the installation, and I was completely comfortable with the easy operation of the CNC in less than a month."

In describing the automatic wheel dressing sequence, Warren also noted how the CNC automatically adjusts the settings to compensate for the reduced wheel diameter after dressing, bringing the wheel to the correct point of contact with the subsequent workpieces every time.

Data such as gear configuration, fixture design and all tool settings are entered into the screens, including pitch, pressure angle, teeth and dressing steps. Once a new part pro-



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gram is completed, the operator at Custom Gear can begin working through the Reishauer-designed man-machine-interface (MMI) set-up screens, which also function in the same manner. Reishauer further allows its customers to add their own HMI screens for features onto the Siemens CNC for data acquisition, training aids and even SPC protocol operations. This service enables the customers to have a common look across the screens on many machines in their shop. This is especially helpful in work cell set-ups where a single machinist is running multiple machines.

Reishauer also uses other aspects of the Siemens product and service package for added functionality, including Siemens motor and drive packages for building the control structure on its machines. According to Richmond, this allows a seamless integration between all drives and the numerical control unit (NCU). It also makes

a much easier task out of the integration of ancillary machine devices such as chip conveyors, filtration systems, wheel dressing stations and especially the critical materials handling and part loading devices frequently built

with its machines for customer work cell set-ups. Siemens uses the Profibus networking protocol, enabling Reishauer to link various control devices and other machine tools together, thus greatly reducing the field

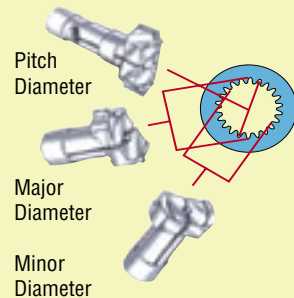
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work integration and wiring time during installs. Reishauer uses Profibus to link the onboard Siemens Sinumerik 840D CNC to VFDs, other drives, electronic gearboxes and balancing systems for the grinding wheel on

its machines.

Mike Rasmann, vice-president of operations at Custom Gear, concludes, "Our investment in the new Reishauer gear grinder has expanded our capability, allowed us to produce

more parts for more existing customers and even opened some new business doors for us. With the added benefit of increased safety on the machine, it was a win-win situation for us, all around."

Rose echoed this sentiment, adding, "It's a great machine. When we have any need for assistance on the machine, including parts and especially application engineering, we know the answer is just a phone call away. Reishauer has been there for us on many occasions. This is a big reason we've done business with them for 15 years and will continue to do business with them in the future."

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