

# 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  $\pm 45$  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.

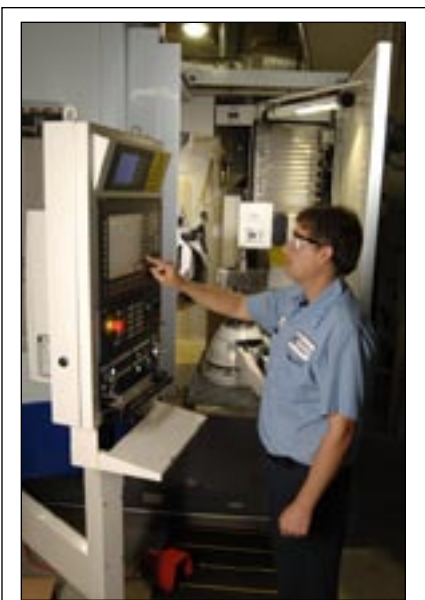
er and add-ons of materials and part handling devices.”

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  
**continued**



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-



## Exceptional quality and far-reaching capabilities ... combined

You could travel the world and not find a gear manufacturer who combines a range of capabilities, exceptional quality and commitment to customer service the way Schafer Gear does.

Located in America's heartland, our connections to partners and resources are truly worldwide. We produce top quality gears of all varieties from spur and helical to bevel and worm. And when it comes to service, we respond with prompt and courteous service every time.

Find out more at [schafergear.com](http://schafergear.com)  
or call us at 574-234-4116.





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

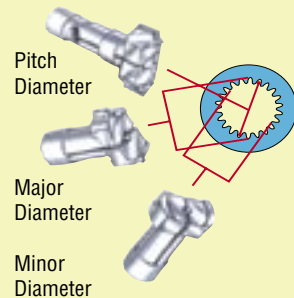
continued

## COMTOR SPLINE GAGES

Rugged, Reliable, Repeatable  
...For 75 Years!



- Applicable to Spur and Helical Gears!
- Gage the Part at the Machine!



For all your gaging needs,  
Comtorgage it!

Analog Dial or  
Digital Readout



Internal or External Spline  
Measurement Made Easy!

*Still using micrometers  
and pins method?*

*Comtor Spline Gages make  
pitch diameter measurement  
quick, easy and accurate!*

# comtorgage®

Comtorgage Corporation

(Since 1928)

Ph: (401) 765-0900 Fax: (401) 765-2846

[www.comtorgage.com](http://www.comtorgage.com)

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."

### For more information:

Custom Gear and Machine, Inc.  
5466 East Rockton Road  
Roscoe, IL 61073  
Phone: (815) 389-6065  
Fax: (815) 389-4548  
[sales@cgearinc.com](mailto:sales@cgearinc.com)  
[www.cgearinc.com](http://www.cgearinc.com)

Reishauer Corporation  
1525 Holmes Road  
Elgin, IL 60123  
Phone: (847) 888-3828  
Fax: (847) 888-0343  
[Reishauer-us@reishauer.com](mailto:Reishauer-us@reishauer.com)  
[www.reishauer.com](http://www.reishauer.com)

Siemens Energy and Automation  
Motion Control Business  
390 Kent Avenue  
Elk Grove Village, IL 60007  
Phone: (847) 640-1595  
Fax: (847) 437-0784  
[Siemensmtbumarcom.sea@siemens.com](mailto:Siemensmtbumarcom.sea@siemens.com)  
[www.siemenscnc.com](http://www.siemenscnc.com)




**Gear Measurement**  
**Accuracy - Innovation - Value**



- GMX series class 1 Universal Gear Testers provide fast, accurate analysis for a wide range of gear and gear tool applications on gears with ODs up to 600 mm (23.6 in).
- The Mahr Federal GMX Series systems include a motorized tailstock and a high-accuracy 3-D scanning probe head.
- In addition to traditional gear analysis, the GMX series also performs form and position measurements as well as measurement of diameters and distances with unparalleled ease and capability.

PRECISION GAGES



SNAP GAGES



AIR GAGING



SURFACE MEASUREMENT



FORM MEASUREMENT



OPTICAL MEASUREMENT



PRECISION LENGTH MEASUREMENT



Mahr Federal - let us demonstrate our complete line of dimensional gages.  
Contact: Mahr Federal Inc., Providence, RI,  
Phone 800-343-2050, Fax 401-784-3246, E-mail: [information@mahr.com](mailto:information@mahr.com), Internet: [www.mahr.com](http://www.mahr.com)

# FANUC Heavy Duty Robots

HANDLE LARGE CASTINGS



The M-1iA compact assembly robot.

At the International Robots, Vision and Motion Control Show in Chicago, FANUC Robotics presented heavy-duty and compact assembly robotics that emphasized the company's latest six-axis technology. Demonstrations included intelligent assembly and Certified Education Robot Training (CERT) units.

The M-200iA/1200 super heavy-duty robot is able to lift parts weighing up to 3,000 lbs.

This is the second in FANUC's line of heavy-duty robots designed to handle truck, tractor, automotive frames and other large castings. The M-2000iA/1200 has a rigid arm design with a vertical lifting

stroke of 6.2 m for transferring extremely heavy items.

The machine was equipped with iRVision 2-D error proofing and Dual Check Safety Speed and Position Check software, demonstrating its high capacity

**continued**

## ECONOMICAL SOLUTIONS FOR PRECISION GEAR GRINDING

Riverside Spline & Gear is proud to feature our new Hoffer Rapid 900 Gear Grinder, offering the latest in form grinding technology. With AGMA class 14+ capability, and on-board gear inspection, you are assured that your gear will meet all design specifications.

External Gears	
Gear Diameter	50-1000 mm
Center Distance Above Table	360-1360 mm
Axial Stroke (Max)	650 mm
Helix Angle	+/- 45°, 90°
Module	1-25 mm <i>(extendable to 34 mm)</i>
Profile Height	41 mm <i>(extendable to 60-80 mm)</i>
Grinding Wheel Width	60 mm <i>(extendable to 90 mm)</i>
Grinding Wheel Diameter	400 mm
Table Load	3000 kg

**WITH OVER 45 YEARS OF EXPERIENCE, IT'S EASY TO SEE WHY INDUSTRY LEADING MANUFACTURERS CHOOSE RIVERSIDE AS THEIR #1 GEAR GRIND SOURCE.**

Riverside Spline & Gear Inc.  
P.O. Box 340 • Marine City, MI 48039  
Phone: (810) 765-8302 • Fax: (810) 765-9595  
valerief@splineandgear.com  
**splineandgear.com**

payload and wrist, by loading and unloading a machine tool bed in front of a 2-D camera. The M-2000iA/1200 operates with the company's latest R-30iA controller with integrated intelligent functions such as vision and force sensing.

"This machine has the highest payload and the strongest wrist compared to all other electric six-axis robots available today," says Ian Orr, product manager at FANUC. "It can support a 1,350 kg payload with a 0.6 m offset from the faceplate and full

articulated motion at the wrist. One M-2000iA/1200 robot can handle a super heavy part, which previously required dual robots, conveyors, lifts and other fixed automation."

FANUC also presented a six-axis, parallel-link robot designed for small part handling, high-speed picking and assembly applications. The M-1iA is a lightweight and compact robot that provides higher speeds and accuracy compared to traditional assembly robots, according to the company's press release. The robot can be installed in a variety of orientations and has a three-axis wrist for flexibility.

"Assembly customers require higher speeds and accuracy to meet their production goals," says Nishant Jhaveri, product manager at FANUC. "The M-1iA's flexibility and speed far exceed the capabilities of other vertically-articulated or SCARA-type robots."

During the exhibition, FANUC demonstrated a CERT mobile training unit with a LR Mate 200iC robot equipped with iRVision 2-D. The robot located blocks with holes, inserted pegs into the holes at 30, 60 and 90 degree angles and then removed the pegs from the block.

The CERT program, launched in 2008, certifies instructors at educational institutions to train their students to program FANUC robots, and is available to qualified high schools, community colleges and universities. It is now being used in schools across the country. "CERT has proven to be a very effective program for training students to be qualified for successful

# Out of This World Gear Tooling

P E R F O R M A N C E

The quality and precision of our broaches and gears have won customers worldwide (and beyond!) – from the smallest gearshop to NASA and the Mars Rover.

Precision manufacturing, modern equipment, advanced technology, and quality control, balanced with talented craftsmanship, means you get nothing but the *very best*.

Guaranteed the most rigid shank cutters and the highest quality level disk cutters made. Products that perform. Why use Broach Masters/Universal Gear? Because your *parts matter!*

As a complete source for all your tooling and production needs. Broach Masters/Universal Gear will supply you with the highest quality products and services that you and your customers expect. *Experience the difference!*

**Call 530 885-1939 or visit  
[www.broachmasters.com](http://www.broachmasters.com)**

**Manufacturers of:**

- Broaches
- Spline Broaches
- Fine Pitch Gear Broaches
- Form Broaches
- Serration
- Bearings
- Shaper Cutters**
- Disk Shapers
- Shank Shapers
- Hex and Square Cutters
- Special Form Cutters
- Inspection**
- Master Gears
- Go-No Go Gages
- Posiloc Arbors
- "Quick Spline" Software

**Made in USA**

1605 Industrial Drive  
Auburn, CA 95603  
**Phone (530) 885-1939**  
Fax (530) 885-8157  
**Web:**  
[www.broachmasters.com](http://www.broachmasters.com)




careers in high-tech manufacturing,” says Kevin Ostby, vice president, customer resource center. “In just over a year there are literally hundreds of students across the country learning to use a FANUC industrial robot while getting practical knowledge of how math and science are applied in manufacturing.”

**For more information:**

FANUC Robotics America, Inc.  
3900 W. Hamlin Rd.  
Rochester Hills, MI 48309  
Phone: (248) 377-7570  
[www.fanucrobotics.com](http://www.fanucrobotics.com)

## CNC Shapers

MACHINE  
MULTIPLE SURFACES  
QUICKLY



Ohio Broach and Machine Company introduces a line of CNC Shaper machines that machine multiple surfaces in seconds, and various parts can be fixtured for machining with repetitive cuts in one shaper cycle. The machine head uses

CNC controls to oscillate a tool up and down at 600 cycles a minute while the machine axes feed work into the tool. This combination of tool and axes feed can produce a multitude of form on parts.

The CNC Shaper machines are customized individually for customer requirements. They are suited for machining small and medium sized parts with special intricate forms, shaping blind hole forms in addition to out-

**continued**

**WE WORK HERE**

Clifford-Jacobs custom high-strength forgings work everywhere and for some of the biggest names in mining, aerospace, and energy.

So whether you need a 5-pound gear blank or an 800-pound finish machined component, depend on Clifford-Jacobs' uncompromising quality. It comes with fast estimates, ready resources, part warehousing, and zero tolerance for failure.

**CLIFFORD-JACOBS FORGING**  
AN IMT COMPANY

[sales@Clifford-Jacobs.com](mailto:sales@Clifford-Jacobs.com) | [Clifford-Jacobs.com](http://Clifford-Jacobs.com) | 888.352.5172 | 150.9001.2000

side shapes and forms against shoulders or other obstructing features. They can be used for gear manufacturing and in the medical, electrical and aerospace industries.

All axes of the CNC Shaper machines are servo-controlled, ball screw driven and controlled through the CNC interface. The main slide ways use a preloaded linear roller system for quick, accurate axis movement. Two models are available: the OB-VM16-2 and the OB-VM20-2. Both have a two-inch standard stroke as an available option.

“The new CNC Shaper machines offer manufacturers capabilities that are more efficient than traditional EDM

machines, which are slower and more expensive,” says Jeffrey Frantz, sales manager for Ohio Broach and Machine Company. “One new shaper machine can now do the work of two or three standard cutting machines. This translates into less capital outlay, lower inventories, reduced lead and production time and less labor.”

**For more information:**

Ohio Broach and Machine Company  
35264 Topps Industrial Parkway  
Willoughby, OH 44094  
Phone: (440) 946-1040  
Fax: (440) 946-0725  
[jfrantz@ohiobroach.com](mailto:jfrantz@ohiobroach.com)  
[www.ohiobroach.com](http://www.ohiobroach.com)

## D.C. Morrison

### REDESIGNS KEYSEATER FOR RIGIDITY

The 3" Keyseater from D.C. Morrison has been redesigned with a back support bracket twice the length of the older models, so it demonstrates improved rigidity and allows for more accurate keyways in a variety of materials, even those that are typically difficult to cut.

A hydraulically-actuated overhead support is a new addition

**continued**





# BeaverMatic

## Your Gear Specialist For Heat Treatment

- Performance proven equipment for heat treating a variety of gears and pinions
- World's largest Internal Quench Furnace with 15,000 pound workload
- Knowledgeable Technical and Sales Representatives
- Best value in heat treating equipment for almost 50 years



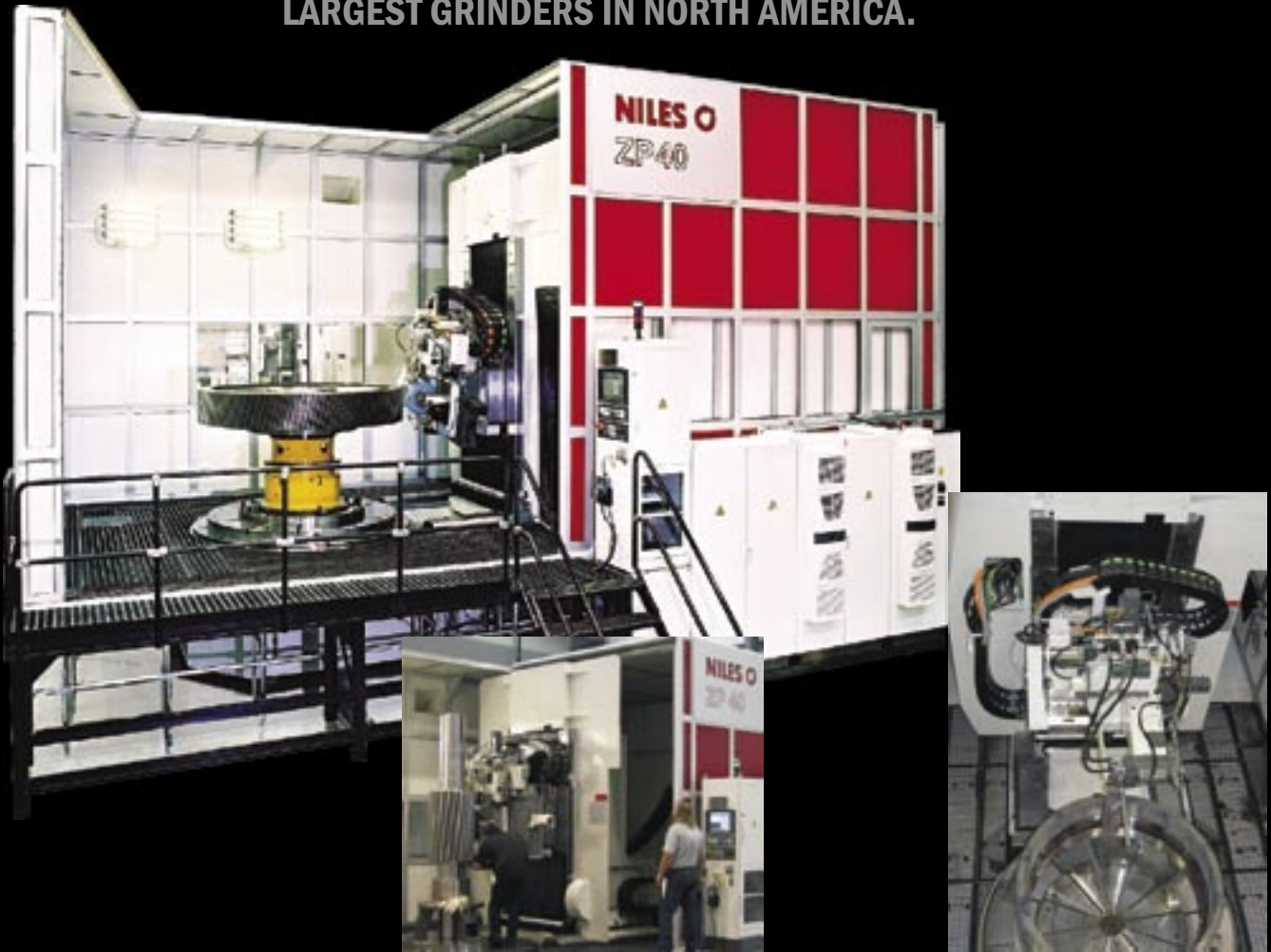
**BEAVERMATIC, Inc.**  
424 Buckbee Street  
Rockford, IL 61104  
Tel: 815.963.0005 / Fax: 815.963.5673  
[www.beavermatic.com](http://www.beavermatic.com) / E-mail: [sales@beavermatic.com](mailto:sales@beavermatic.com)

Booth No. 2512 @ ASME Heat Treat Exposition



# WE'VE EXPANDED WITH A NEW LOCATION.

OUR NEW GEAR GRINDING AND MANUFACTURING FACILITY HOUSES ONE OF THE LARGEST GRINDERS IN NORTH AMERICA.



KAPP O NILES

The ZP 40 grinding machine features the ultimate in design construction with true hydrostatic guideways and rotary table. The work table is direct drive. Nodular cast iron is used for the machine beds, columns, and all sub-assembly housings, for stability. The machine accuracy is therefore assured for a long lifetime.

The ZP40 is designed to profile grind spur and helical external and internal gears using dressable corundum or sintered grinding wheels. An integrated measuring device further increases machine's flexibility. The ZP machine can be set up to accommodate application-specific requirements for maximum flexibility, high precision and optimum productivity.

It is specifically designed to accommodate shaft pinions, mating bull gears and internal ring gears.

Extended capacity for gears and profiles is:

- Internal and external gear grinding up to 4m(160") OD x 1.5m(60") face.
- The ability to inspect lead, profile and spacing up to 4m (160")



**Havlik** GEAR

Div. of Havlik International Machinery Inc.

455 Sheldon Dr., Cambridge, Ontario N1T 2B7 tel 519-624-6240 fax 519-624-4119



Visit us at booth 437

[www.havlikgear.com](http://www.havlikgear.com)

tion to the keyseater, so operators can move the support with the push of a button. A programmable logic controller and human machine interface were added for more user friendly

programming. The Morrison Keyseater doesn't require positioning in a pit or bushings to center the keyways. The machine cuts from 1/8" to 3" wide and up to 14" deep.



### For more information:

D.C. Morrison  
 201 Johnson Street  
 Covington, KY 41011  
 Phone: (888) 246-6365  
 Fax: (859) 581-9642  
[dcmorrison@fuse.net](mailto:dcmorrison@fuse.net)  
[www.dcmorrison.com](http://www.dcmorrison.com)



### Effective wind energy starts with high part accuracy.

The reliability of wind turbines depends highly on the accuracy of critical parts such as pinion cages and housings of planetary gears. Leading manufacturers around the world rely on Carl Zeiss MMZ CMMs with VAST Active Scanning and CALYPSO software to verify critical components and ensure part quality.

[www.zeiss.com/mmz](http://www.zeiss.com/mmz)



Carl Zeiss  
 IMT Corporation  
 (800) 327-9735  
[www.zeiss.com/imt](http://www.zeiss.com/imt)



- Styli & Accessories*
- Same-day Shipping
  - ZEISS Components
  - Dedicated Service
  - M2-M5 In-stock



We make it visible.

## Slater

### DOUBLES BROACH HOLDER LINE

The Rotary Braoching Tool Holders line for CNC, screw and swiss lathe machines and milling machines from Slater Tools Inc. has been expanded to offer 38 broach holders. The tools are used to put hex and square shaped holes into metal parts such as for aerospace applications and orthopedic bone screws.

According to Peter Bagwell, engineer and marketing manager for Slater Tools, Slater broaches are often used to make gears with spline shapes. "The expand-

ed use of rotary broaching tool holders in new and used CNC machines has created the need for a larger variety of function and adaptability in these tool holders,” Bagwell says.

“Rotary Broaching tools can be used to make various gear forms with smaller diameters and shallow depths. Broaching can be done on a CNC machine, lathe or mill, and most often costs less than performing secondary operations,” Bagwell says. “The most popular gear forms are serrations, splines and involute forms.”

The Swiss type holders include new diameter sizes and some include longer shank lengths. They are suitable for applications where the form being broached is less than 0.050 inches in diameter.



**For more information:**

Slater Tools Inc.  
44725 Trinity Drive  
Clinton Township, MI 48038  
Phone: (586) 465-5000  
Fax: (586) 465-3030  
[direct@slatertools.com](mailto:direct@slatertools.com)  
[www.slatertools.com](http://www.slatertools.com)

# “Improving Gear Quality”



**ND300**  
**NEXT DIMENSION®**  
CNC gear measurement system  
**Proven, Practical...PECo**

## Preferred Choice - Complete Satisfaction

*“...Have not found anything that has all of the attributes that the Next Dimension has...”*

**Stephen Fernung, Remy Inc.**

*“...PECo's customer service has been extraordinary ...”*

**Kevin Streck, Lubrizol**

*“...The ND 300 can check profiles on 64 to 120 DP gears, that really got my attention...”*

**Mitch Gerhardt, Gerhardt Gear**



**Call today at 800.998.4191**  
**Outside the USA at +1.937.667.7105**  
[www.GearInspection.com](http://www.GearInspection.com)

**PROCESS EQUIPMENT COMPANY**