



# HIGH TECH GEAR MANUFACTURING

## Only at Gear Expo

**William R. Stott, Managing Editor**

Maybe you're looking for someone who can make AGMA Q12 plastic gears at production-level quantities.

Maybe you're looking for a powder metal gear manufacturer who can provide gears nearly as dense as wrought steel.

Maybe you need a quality gear manufacturer with experience working in stainless steel for your biomedical devices.

Maybe you're outsourcing gears that you used to make in-house, but you need a supplier with modern equipment, sophisticated quality controls and the capacity to handle your jobs.

Maybe you didn't know it, but you can find all that and more October 16–19 at Gear Expo in Detroit.

A lot of people, even in the gear industry, may think of Gear Expo only as a machine tool show—a place where gear manufacturers can go to see and learn about the latest in manufacturing technology—and it is. The latest machine tools and processes will be on display as normal.

But over the years, Gear Expo has also grown as an exhibition catering to gear buyers. In fact, at this year's show, more than

30 gear manufacturers will have booths, including suppliers of gears in a wide range of pitches, sizes, materials and quality levels manufactured using a variety of methods.

"I've been going to the Gear Expo since it started," says Dennis Regan, president of American Precision Gear of San Carlos, CA. "The trend I've observed has been more and more gear manufacturers every show."

Regan's company is exhibiting for the first time at Gear Expo. He says the time was right for APG. At one point, the company's customers were mainly California-based aerospace and defense electronics firms, but now APG has expanded to other industries, including, most notably, biomedical devices and other precision gears.

"We do a lot of things other companies don't do," Regan says. One APG area of expertise is in precision biomedical components, ranging from stainless steel gears as small as 3/8" in diameter to more coarse-pitch gears up to 48" in diameter for applications like patient-rotating tables.

### Focus on Technology

Most of the gear manufacturers at Gear Expo will be talking about quality and advanced manufacturing processes. They've

made significant investments over the past several years in order to expand their capabilities and produce more gears at lower prices and higher quality levels.

“High tech is the theme of our show this year,” says Russell Beach, vice president of sales for Nissei Corp. of America, which is focusing this expo on quality and his company’s ability to document it.

A supplier of precision spiral bevel and hypoid gear sets, Nissei offers some quality control measures—such as single-flank testing of gear sets—that aren’t available from all suppliers. Single-flank checking allows the company to better serve each customer, Beach says. “It enables us to help him understand noise and vibration.”

Nissei also provides complete topological checks of spiral bevel and hypoid gears via CMM measurement, which is more than the standard double-flank check offered by some gear manufacturers. “We have the tools to help people—in a modern way—to understand their gears,” Beach says.

Nissei, which manufactures gears in Japan, has added a number of new machines for gear manufacturing in the last year, including two new Gleason Phoenix 175’s and some highly accurate CBN OD grinders, Beach says.

Renold Gears will also promote the use of the latest technology in the gears it offers to customers. Using the new GTG2 gear grinder from sister company Holroyd Machine Tools, Renold Gears is offering a custom ground gear manufacturing service for spur and helical gears.

“The precision helical service extends our range of loose gear products and is a complement to our existing range of complete worm gear and bevel helical gearboxes,” says Roger Godson, Renold Gears sales director. “Using the newly introduced GTG2 machines, we can offer singles, short runs and batches of helical and spur gears to DIN 2 levels of quality with some features achieving DIN 1. This sort of accuracy means that our service is ideal for providing items such as master gears for prototyping, timing gears for use in aerospace applications and helical gears for use in high performance automotive gearboxes and oil pumps.”

Continued



Forest City Gear, booth 266, offers its customers of fine- and medium-pitch gears a promise of quality—backed up by its dedicated gear inspection lab.

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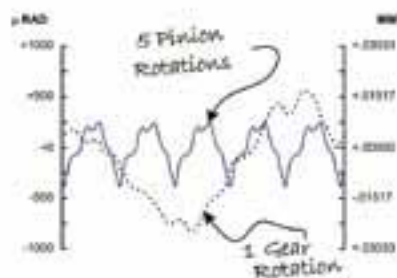
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Visit us at Gear Expo 2005, Booth #438

## Problems With Your Bevel Gears?

Maybe it's because your supplier is **CLUELESS**  
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Single Flank Transmission Motion Error (SFTME)  
a direct measurement of how smoothly the pinion is driving the gear

Do You Know Your Bevel Gear SFTME?

Hint: You'd know if Nissei Corporation was your supplier!

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The GTG2 is a form grinding machine for gears and threads. It is capable of producing complex lead and profile modifications.

But Godson adds that it's more than just the machine that makes for better gears. "What differentiates our service in a competitive market is that we provide a package of design advice and manufacturing which not only ensures the highest levels of precision, but also optimizes gear performance."

### Alternatives

Gear Expo exhibitors also offer plenty of alternatives for the gear buyer, including a number of manufacturers of plastic and powder metal gears. Those manufacturers are equally eager to tout their respective technologies and capabilities.

Capstan Atlantic, a manufacturer of powder metal components, will be talking about some of the company's higher-end applications, says Mike Smith, vice president of sales.

Those applications are ones that take advantage of the company's proprietary rolling process for surface densification of P/M parts. This process allows Capstan to produce gears up to AGMA Q9 quality levels and part densities up to 7.4 g/cm<sup>3</sup>, he says.

Also, over the past year, Capstan has expanded on this ability by introducing tooth crowning to the process. "This provides for improved load distribution and reduced noise," Smith adds.

Capstan is eager to meet with auto-industry gear buyers who are sure to be among the visitors because the show is in Detroit. The company is looking for applications where powder metal components might replace those that are currently being made from wrought metal. "We're looking for converts," Smith says.

Plastic gear manufacturers are also looking to take advantage of access to automotive industry buyers, says Steve Eddy, sales and development manager for Enplas USA.

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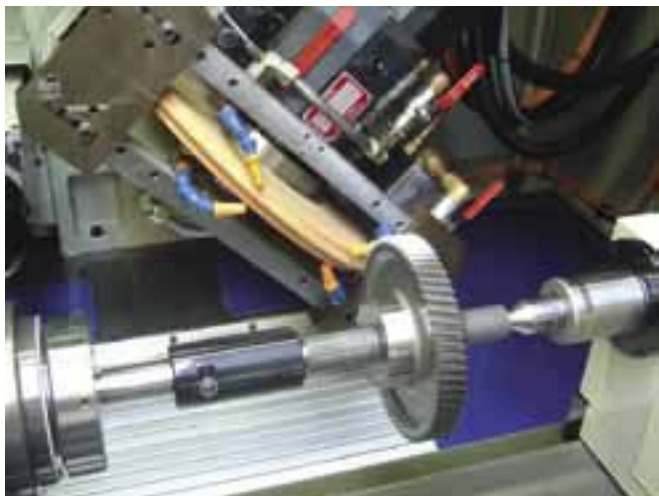


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Arrow Gear Co., booth 572, has recently begun manufacturing precision ground curvic couplings for its customers.



Renold Gears Ltd., booth 322, takes advantage of the new GTG2 gear grinding machine in offering its custom helical gear manufacturing service.

Enplas is introducing a new "Backlashless" gear design at Gear Expo. This design reduces contact stresses and the problem of "gear slap," which contributes to noise and failure in many automotive actuators, Eddy says. The new design keeps both sides of the gear tooth engaged without requiring more torque.

In many systems, backlash is controlled in similar geared actuators through the use of an assembly that includes a spring to keep the gear teeth engaged. The "Backlashless" system from Enplas, however, is not an assembly. It's an as-molded part with no spring, Eddy says.

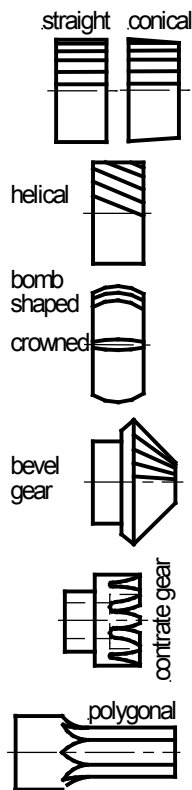
A sample application using the "Backlashless" gear will be on display at the show. Visitors will be able to turn the gears to feel and hear the difference.

Possible applications for the device include automotive actuators for HVAC controls, door locks, power lift gates, power sliding doors and steering-angle sensors. It's also an important technology for applications such as printer gears, where backlash in the gear system has a direct effect on the quality of the printer's output, Eddy says. "It's good for anywhere where gear slap or transmission error is of great importance."

Like Capstan, Enplas is looking for metal gear converts, and Eddy points to the company's focus on gear quality as a good reason for some to consider switching. The company is currently successfully mass producing AGMA Q12 gears by injection molding, Eddy says: "Three million a year." ■

## STRAUSAK HS 38 CNC

FOR SMALL GEARS, MODULE RANGE DP 500 TO DP 25



### Construction

The gear hobbing machine HS 38 is appropriate for the fully automatic high-speed teeth cutting of pinions and wheels (straight, helical, bevel and contrate gear) of highest precision. A cutting speed of 1,000 m/min. is possible with the new machine concept.

### Characteristics

- various possibilities for a flexible production (see left)
- operationally reliable CNC control SIEMENS 840 D
- high indexing precision by means of an electronic gear box
- many different loading devices can be mounted on the machine

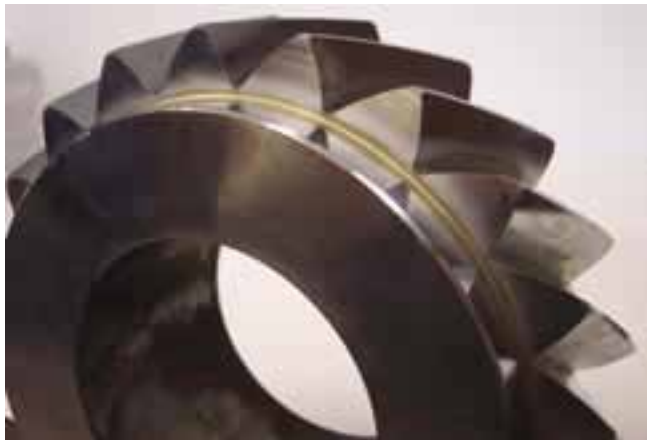
### Advantages

Universal gear hobbing machine concept with the following advantages:

- production on the same machine as spur, helical, bevel and contrate gears
- reduced downtimes
- important reduction of costs in production
- higher net yield

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Power Engineering and Manufacturing Ltd., booth 547, uses proprietary gear designs to give customers greater horsepower and longer gear life.

|                                 |     |
|---------------------------------|-----|
| Reliance Gear Corp.             | 614 |
| Renold Gears Ltd.               | 322 |
| Riley Gear                      | 669 |
| Riverside Spline & Gear Inc.    | 701 |
| Seitz Corp.                     | 436 |
| Thermotech Co.                  | 605 |
| Tifco Gage & Gear               | 673 |
| UFE Inc.                        | 419 |
| Unigear Industries Inc.         | 711 |
| United Plastics Group Inc.      | 108 |
| VCST Powertrain Components Inc. | 312 |

**Check out these gear manufacturing exhibitors at Gear Expo 2005:**

|                                     |     |
|-------------------------------------|-----|
| All-Horng Gear Industry Co. Ltd.    | 416 |
| American Precision Gear Co. Inc.    | 637 |
| Ancon Gear & Instrument Corp.       | 649 |
| Ann Arbor Machine Gear Technologies | 348 |
| Arrow Gear Co.                      | 572 |
| B&R Machine and Gear Corp.          | 516 |
| Bevel Gears (India) Pvt. Ltd.       | 515 |
| Capstan Atlantic                    | 715 |
| Carnes-Miller Gear Co. Inc.         | 617 |
| CST-Cincinnati                      | 316 |
| Custom Gear & Machine Inc.          | 401 |
| Delta Research Corp.                | 675 |
| Enplas USA Inc.                     | 126 |
| Fairfield Manufacturing Co. Inc.    | 364 |
| Forest City Gear                    | 266 |
| Gears & Gear Drives                 | 726 |
| Great Taiwan Gear Ltd.              | 308 |
| Hawk Precision Components           | 748 |
| Ikona Gear International            | 415 |
| Innovative Rack & Gear Co. Inc.     | 663 |
| ITW Spiroid                         | 272 |
| Metal Powder Products Co.           | 619 |
| mG miniGears North America          | 403 |
| Nissei Corp. of America             | 407 |
| Perry Technology Corp.              | 466 |
| Power Engineering & Mfg. Ltd.       | 547 |
| Premium Energy Transmission Ltd.    | 712 |
| Raycar Gear & Machine Co.           | 434 |



Capstan Atlantic, booth 715, offers P/M gears up to AGMA Q9.

**GEAR EXPO**  
**October 16-19**  
**Cobo Hall**  
**Detroit, MI**  
[www.gearexpo.com](http://www.gearexpo.com)