

Koepfer Offers Training in Parallel Axis Gear Manufacture

A gear manufacturer's dilemma: training versus production. Teaching new, entry-level employees versus interrupting work on the factory floor. A solution: intensive, off-site training that includes lecture on fundamentals and demonstrations of gear-manufacturing machinery.

One company offering this solution for parallel axis gears is Koepfer America LLC via its three-day seminar, "Fundamentals of Parallel Axis Gear Manufacturing."

"It is an accelerated class, so at the end of the three days, there is a lot of knowledge transferred," says Dennis Gimpert, Koepfer America's president and the course's main instructor. "It's a manufacturing, industrial engineering-type course."

This seminar will next be held May 23–25 at Pheasant Run Inn and Resort, in St. Charles, IL. The course is designed for entry-level personnel—"By that, we assume they don't know what a gear is," Gimpert says. Still, many past students have had considerable gear manufacturing experience. Attendees have included manufacturing managers, industrial engineers, supervisors, set-up people, operators and quality control personnel.

The seminar will cover gear nomenclature, basic gear mathematics, hobbing, shaping, finishing—including skiving—gear inspection using AGMA and DIN standards, and troubleshooting. The course will also cover fixturing, blanks, use and support of cutting tools, and multi-thread hobs. Other topics include automation systems and estimating production times for making gears using the above processes.

The course also provides demonstrations of gear manufacturing equipment, including hobbing, gear shaping, gear grinding—both form and generating—and gear inspection machines. "Just about

everything we talk about," Gimpert says.

The demonstrations take place during tours, which occur every day. The tours are of four gear-related companies: 1.) Forest City Gear, which has a variety of current equipment, 2.) a manufacturer of large gears, 3.) a motor and gearbox manufacturer, and 4.) Koepfer America, which can demonstrate machines such as hob sharpeners. Transportation to and from the tours is provided.

In-class lectures consist of PowerPoint presentations; videos of hobbing, gear shaping, grinding and inspection; example problems, so students can practice gear mathematics; and question-and-answer sessions.



Gimpert, the main instructor, has been in the gear industry for more than 30 years, starting as an application engineer, first with Barber-Colman Co., then with American Pfauter Corp. He moved into sales while with American Pfauter. He became Koepfer America's president when the U.S. operation opened. His experience was "always on the machine side, but it included grinding, shaping and inspection, and it continues to this day."

Each student receives a workbook, scientific calculator and other materials

for the course. After the seminar, attendees can keep the materials, including the scientific calculators.

"The handbook becomes a great resource," Gimpert says. He describes it as a guide for troubleshooting gear problems, a guide he himself uses. The workbook, 250+ pages, includes copies of the class presentations, equations, example problems, their solutions, and a picture dictionary, which provides words, their abbreviations and drawings to illustrate the terms.

"In the beginning, that's very useful," Gimpert says of the dictionary.

Also, attendees are taught to read inspection charts, using them to detect gear problems, which may result from a machine's set up, cutting tool or blank. They learn a logical approach to solving problems, too.

Class size is limited to 30 people to promote interaction, with students being invited to contribute to answering other students' questions. "Too big a group restricts interaction," Gimpert says. Also, each attendee can submit a problem from work in advance of the seminar. If appropriate, the problem would be covered in class.

The course costs \$795 per person and includes meals: continental breakfasts, buffet lunches and dinners. The price doesn't include hotel accommodation.

To reserve hotel rooms, attendees should phone Pheasant Run Resort at (630) 584-6300. They can obtain discounted rates by mentioning they're with the Koepfer group. Also, the resort offers shuttle service, so attendees can arrange transportation to and from the airport.

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UK Manufacturing Expos Join Forces

MACH 2006, a British manufacturing technology show, will take place May 15–19 at the National Exhibition Center (NEC) in Birmingham, England. Primarily a machine tool show, MACH 2006 will be co-located with the Drives & Controls component show, as well as several other related industrial shows.

The MACH 2006 expo features machine tools, cutting tools, CAD/CAM, metrology and other technology for manufacturing.

FANUC Robotics will have a gear assembly cell at its booth to demonstrate a new range of integrated sensor systems. Developed by FANUC for use on its Intelligent Robot range, the sensors are designed to bring system integration into the world of plug-and-play.

Visitors to the FANUC exhibit will have the opportunity to randomly load components into the gear assembly system, which uses force sensing and a 3-D vision system. A FANUC Robotics M16iB Intelligent Robot fitted with a V-500iA/3DL laser vision sensor will locate the gears and pick them up.

The robot will then assemble the gears by feeling the fit, with a FANUC FS-30 force sensor fitted to its wrist.

The demonstration illustrates the savings that can be made on reduced tooling requirements for applications including machine loading, depalletizing and assembly.

The Drives & Controls show takes place at the NEC May 16–18. Exhibitors at Drives & Controls include suppliers of drives, motors, power transmission, automation and motion control applications, such as Danfoss, Güdel, Mini Gears (Stockport) Ltd., Rexnord, Rossi Gearmotors and SEW-Eurodrive.



In addition, the following shows will be co-located with MACH 2006:

- **Electrex**
- **Air-Tech**
- **Product Development 2006**
- **Subcon**
- **Environmental Technology**

A number of gear manufacturers will have displays at the Subcon show, including Depe Gear, Gibbs Gears, HPC Gears, and J&D Gears.

The organizers expect the combined shows to draw more than 40,000 attendees.

For more information:

MACH 2006

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April 25–28—Plastic Gear Design & Manufacturing. Universal Technical Systems, Rockford, IL. Focuses on robust design methods, application of non-standard proportions, material properties, operations variation, predicting tooth deflection, contact ratio and tip relief. A tour of Forest City Gear is offered, as well as one-on-one time with an instructor to discuss design problems. Knowledge of TK Solver is a pre-requisite. \$1,250. For more information, contact UTS by telephone at (815) 963-2220 or by e-mail at sales@uts.com.

May 2–3—Designing Products for Assembly. Madison Concourse Hotel, Madison, WI. An intensive course sponsored by the University of Wisconsin at Madison focusing on assembly methods, component tolerances, number of adjustments, type of fabrication tooling and the Design for Assembly process. \$1,195. For more information, contact the school's engineering department by telephone at (800) 462-0876 or on the Internet at epd.engr.wisc.edu/webH524.

May 3–7—Taipei International Manufacturing Technology Show. Taipei, Taiwan. A general, integrated manufacturing technology and equipment trade fair showcasing Taiwan's capabilities in machinery, equipment and technical services essential for product design, components' purchasing subcontracting, facilities acquisition and plant construction. Registration is free. For more information, visit the website at www.TaipeiTradeShows.com.tw.

June 5–7—AGMA Regional Gear School. Star SU, Hoffman Estates, IL. Concentrates on the relationships between basic geometry of parallel axis gears and the inspection and manufacturing process with additional details regarding logical troubleshooting. \$750. Additional courses are planned for the Southeast and West Coast in 2006. For more information, contact the Gear Consulting Group by telephone at (231) 829-3760 or via email at gearconsulting@aol.com.