

Sponsors Predict Biggest IMTS Ever

In 1927 the first precursor of IMTS was held in Cleveland. Back then, lasers, robots and computer controls were just science fiction. At IMTS 98 they will fill nearly every last corner of the recently expanded McCormick Place.

Sponsors expect IMTS 98 to break records. Already it's the biggest IMTS in terms of exhibit space (1.4 million square feet) and exhibitors (more than 1,400). And if registration continues at its current pace, we could also see new highs for attendance and sales made at the show.

The following are just some of the companies that might be of interest to gear manufacturers.

IMTS 98 BASICS

The International Manufacturing
Technology Show

September 9-16, 1998

McCormick Place, Chicago, IL

Registration: (800) 322-IMTS

Additional information:

www.imts.org



GUIDE TO THE BOOTHS

A.G. Davis/AA Gage (Booth E1-2332) will have on display their line of Hydra-grip hydraulic expansion arbors and chucks for gear grinding, hobbing, shaping, honing and other manufacturing operations. They will also show their line of face gear couplings.

Bourn & Koch Machine Tool Co. (Booth C2-5473), will exhibit the model 400H 5-axis gear hobber. The unit at the show will be an extended bed version with an optional sliding operator guard. The machine is capable of producing AGMA quality 10 on parts with diameter up to 400 mm. The machine features a hob slide that can accommodate up to 6" X 7" hobs and is CNC controlled to allow programming cycles for crowning, tapered root spline hobbing and the shifting between different hobs or cutters on one arbor. Bourn & Koch is a manufacturer of OEM gear hobbers, gear shapers, specialty gear machines, dial machining centers, extrusion milling machines, specialty machines, turning centers, machining centers, grinders, boring machines and more.

Emuge Corporation (Booth E1-2352) is a premier manufacturer of quality workholding and electronic control systems for gear manufacture. Emuge will feature a precision clamping product line that includes arbors, chucks, diaphragm chucks, spindles, draw bars and machine operation measuring systems configured to accomplish a broad range of turning, grinding, hobbing, milling, drilling, lapping, balancing, inspection and assembly operations. Emuge's mechanical, hydraulic and mechanical/hydraulic systems achieve an excellent runout accuracy—typically .00008 to .0002—and are renowned for reliability, functionality, clamping element interchangeability and ease of maintenance. Custom application services are offered. Emuge's Web site at www.emugecorp.com outlines details.

Euro-Tech Corporation (Booth E1-2530) will show the Franco line of gages and workholding devices, Mytec hydraulic expansion arbors and chucks and the Euro-Tech Power Block III toolholder. Franco's product range includes extremely long-wear go/no go gages,

bevel gear testing gages, completely automatic spline and cluster shaft inspection systems and a full range of clamping arbors, chucks and nests for inspection and machining applications. Mytec rupture-proof arbors and chucks are ideally suited to precision applications. Mytec arbors and chucks provide normal runouts under .00012" for grinding, hobbing, shaving, shaping and inspection of gears. The Euro-Tech Power Block III

mounts directly to your bench or work table to make tool changes easy and risk-free. Vertical and horizontal axes allow access to the bottom of the toolholder. Either axis may be outfitted with like or different receptacles to accommodate any standard or custom toolholder tapers, including HSK.

Gleason Pfauter Hurth (Booth B1-7150) will exhibit several new products for gear manufacturing. The new Power

Dry Cutting process for bevel and hypoid gears will be demonstrated on the new Gleason 175HC Power Dry Cutting machine. The 175HC will demonstrate face milling and face hobbing on bevel gears. Gleason will also premier the new 600HTL Hypoid Turbo Lapping machine for hard finishing bevel and hypoid gears. The turbo lapping process (ultra high speed) is possible due to Gleason advances in machine dynamics and compound application technology. Gleason-Pfauter will exhibit for the first time the new (16") P400G profile grinder with integrated gear measuring and integrated CNC wheel dressing. Gleason-Hurth will demonstrate the capabilities of the ZH125 CNC spheric honing machine for hard finishing cylindrical gears using an internal abrasive honing tool. The machine will be shown with automation. Gleason and Pfauter will also exhibit, for the first time, a new joint engineering and manufacturing cooperation in machine design with a new gear manufacturing machine to be unveiled at IMTS.

Gold Star Coatings (Booth E1-2701), a subsidiary of Star Cutter Co., will feature thin film coatings used to either improve tool life on cutting tools and dies or improve wear life on parts.

H.B. Carbide Co. (Booth E1-2700) a subsidiary of Star Cutter Co., will feature its line of carbide pre-forms used to manufacture finished tools and wear parts.

Holroyd (Booth B2-6516) will show, for the first time anywhere in the world, the TG150E thread grinder. This is a 'sister' version of the TG350E launched two years ago as the first in a planned new generation of machines. The TG150E has been specifically designed for grinding smaller components, with profiles up to 70 mm wide and less than 300 mm in diameter (the TG350E has a maximum 350 mm capacity and 110 mm profile width). An important feature of the new machine is integrated 3D component profile measurement with automatic machine compensation to all axes. Also on display will be a range of worm gears, screw compressor rotors and other helical products manufactured by Holroyd's subcontract facility.

MMT... Products for Manufacturing

Since 1961 Mitsui Machine Technology has represented a number of Japan's top manufacturing companies in markets throughout North America. We import only the highest quality products for distribution through a network of qualified machine tool dealers. You get the latest in manufacturing technology from a local source with full factory support for all parts and services from MMT. At Mitsui Machine Technology we're helping you grow - Profitably.

IKEGAI

Over 50 standard models—turning machines, mill-turn machines, machining centers, gear hob and grinding machines, boring and milling machines and internal/external grinders—a machine tool for virtually all requirements.

- Universal and chucker CNC turning including mill-turn from 8" to 24" chuck (up to 120" center distance). Heavy duty CNC machines, swing-over bed to 98" and center distance to 314". CNC VTL with 49 3/8" table and mill-turn capability.
- Vertical and horizontal machining centers and HBMs. Verticals feature exclusive U-axis. Horizontal has 10,000 RPM with No. 50 taper and 24" pallets. HBM tables from 37.3" x 41.3" to 98.4" square and W-axis control of 4.3" to 5.1" diameter spindles.
- CNC internal/external grinders with X and Z axis full scale closed loop control. Hob sharpening, (4) axis CNC and CBN wheel capability.
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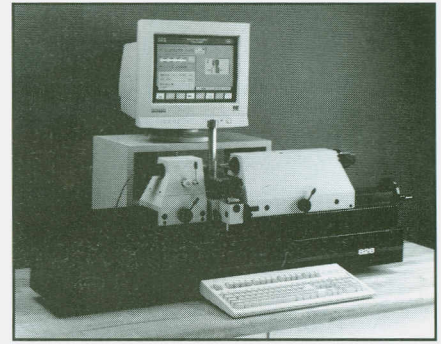
Kapp Sales & Service L.P. (Booth B1-6981) represents the Kapp and Niles product lines of internal and external grinding machines featuring stock dividing, on-board measuring, dressable wheels and CBN wheels for the manufacture of internal and external spur and helical gears, ball screw tracks, worms, compressor rotors, rotary pistons (root type), pump spindles (IMO type), pump rotors (gerotor type), vane pump rotors, constant velocity tracks (CVT and the like) and more.

Koepfer America, L.L.C. (Booth B1-6961) will display a new high-speed, eight axis gear hobbing machine with computer controlled flexible automation. The Koepfer Model 160 is designed for shaft, pinion and gear work up to 60 mm and 2.36" diameter. The machine includes eight axes of CNC control, including tailstock and gantry loading arm positions to reduce setup time and improve overall efficiency. A unique slant bed design provides ideal chip flow and allows the user the choice of wet or dry hobbing. High spindle speeds (cutter up to 5,000 rpm and work spindle up to 1,000) allow optimum use of coated carbide cutting tools even when hobbing parts of small diameters or low numbers of teeth. The automation allows loading of a part in two seconds.

M&M Precision Systems Corporation (Booth B1-7149) will feature metrology systems for parallel axis and spiral bevel gears, gear cutting tools, thread gages and turbine blades. 3515 and 200 Series CNC inspection systems for gear manufacturing process control, running a full complement of inspection software, will be networked to a remote workstation with M&M's GearNet™ software. M&M will highlight multiple probe technology with demonstrations of ID, 3D and laser probe scanning. New LMS laser measuring systems will showcase non-contact scanning for thread gages and turbine blades. The GRS-2 double flank gear roller system and durable ODM-8 dimension over pins gage will also be shown.

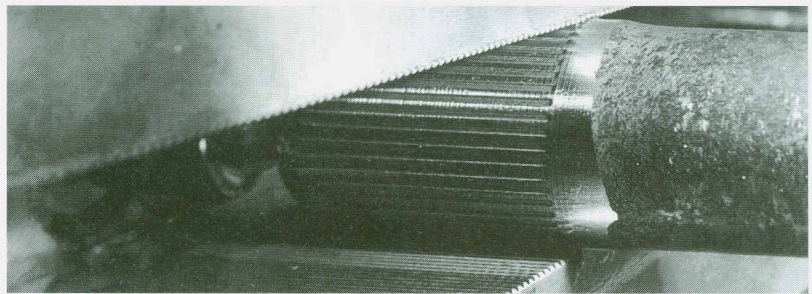
Mahr Corporation (Booth D2-4437) will present metrology products for measuring gears as well as surface texture, form and length on a variety of parts. The

Extrameas 2000 is a new analog/digital inductive comparator accurate to .000012". The M1 and M2 are the first of a new series of surface texture measurement instruments designed for the shop floor. The Optimar 100 is a new bench-top calibration system for dial indicators, dial comparators, dial test indicators, incremental probes and LVDTs. A staff of applications engineers and technical specialists will be on hand to discuss the new products.



The 828 PC calibration center from Mahr Corp.

3 REASONS TO USE COLONIAL SPLINE RACKS



- 1** **Proprietary design, engineering and manufacturing.**
- 2** **Involute splines, helical splines, tapered splines, threads.**
- 3** **Production spline rolling supported by SPC.**

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From the desk of Fred Young, President, Forest City Gear

Noise, Misalignment, Banding, Transmission Error, Harmonic Resonance, Binding, Roughness

These are a few frequently occurring problems with gears. Are you losing business to competitors because of noise and poor efficiency? Forest City Gear has resolved these problems for many diverse companies with our high accuracy cut gears.

CROWN HOBBING

We have pioneered *fine pitch crown hobbing* (putting a radius on the flank of the tooth along the longitudinal axis) which has dramatically reduced noise especially in helical applications and compensated for various misalignment scenarios. Almost single-handedly we introduced this concept to the American power tool industry and many small motor manufacturers.

CARBIDE REHOBBING

We reduced gear error by *carbide rehobbing* gears after they have been heat treated to 60Rc. Only a few gear producers utilize this advanced technology. Precise index accuracy for x-ray positioning equipment, telescopes, printing presses, copiers, plotters & printers—these are a few applications assisted by Forest City Gear.

ANALYTICAL GEAR INSPECTION

Few people have the *inspection capability* to investigate and monitor profile error as does FCG. Our analytical gear checkers verify lead and profile error to ten millionths of an inch. You may already be one of about eighty **gear manufacturers** assisted by FCG to produce quieter, more accurate gears. Accuracy of profile is determined by the quality of the hobs, *hob re-sharpening* (another of our services) and mounting on the gear machine. Problems here effect transmission error and noise. Lead error and crossed bearing cause premature failure and contribute to excess backlash as well as noise variation.

STATE-OF-THE-ART MACHINERY

Gear cutting equipment at Forest City Gear is offered for resale after three to five years, to be replaced by more efficient *state-of-the-art new machinery*. Index error, another bugaboo contributing to roughness, is common to gear producers using obsolete gear equipment with very worn master index gear and transmission components. Accumulated spacing error can occur during heat treatment or from multistart hobs as well as from badly worn gear equipment. This non-adjacent index error excites transmission errors, banding and harmonics. Finally all of these problems are additive to plain old runout or eccentricity which can be caused by bad gear blanks, inadequate and inaccurate work fixturing as well as worn master drive worm gears and cutter spindles in the gear machines. These conditions, unfortunately, are all too common in the American Gear industry and overseas.

LET US HELP

Our ability to measure these attributes and determine their causes has allowed us to help countless people in the power transmission and motion industry through the years. We would like an opportunity to confirm the accuracy (or inaccuracy) of your gears, which we offer as a service, and provide you opportunity to improve your products. We look forward to hearing from you.

Sincerely,

Fred M. Young

Fred Young



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- Hobbing 2 tooth & greater helical pinions.
- High helix worms and camshafts.
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- Hob sharpening.

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Mitsubishi Machine Tools (Booth A1-8242) will demonstrate its line of gear hobbers, shapers, shavers and grinders. Mitsubishi's gear shapers and hobbers have sophisticated cutting mechanisms for high productivity shaping and hobbing of gears up to one meter in diameter. Their gear shavers can handle gears up to 450 mm diameter.

Mitsui Machine Technology Inc. (Booth A1-8733) represents Ikegai Corporation with their full line of CNC machining centers, including gear hobbing, boring, milling, turning, grinding and combination machines. MMT also will show the O-M Ltd. line of vertical CNC lathes and the Howa Machinery Co. line of vertical and horizontal CNC machining centers.

National Broach (Booth B1-7490) introduces three new gear machines at IMTS 98. The NBV 5-8 is a low-cost, small part broaching machine with a low table height and transfer height, eliminating the need for pits and platforms and improving user accessibility. The Red Ring Shavemaster 400 combines advanced software, rigid design and kinematics to enable higher quality, greater efficiency and more complex parts than ever before. The CLP-35 CNC gear checker can inspect profile, lead and pitch of gears, hobs, shave cutters and worm gears. All assemblies on the CLP-35 are hand scraped for absolute static accuracy. In addition to the new machines, visitors will see demonstrations of broaches, shave cutters, hobs, hones, roll form racks and master gears.

Pfauter-Maag Cutting Tools (Booth B1-7150) is a world leader in the manufacturing of hobs, shaper cutters, shaving cutters, form cutters, CBN grinding wheels, thin film coating, bevel gear tools and heat treat service. Their products are sold throughout the United States, Mexico, Canada, Asia, Europe and South America. Pfauter-Maag features tools made of premium high speed steel as well as carbide.

Radyne (Booth C2-5364) will exhibit its Power Integrated Solid State Induction Heating systems—the Power Integrated ScanMaster, incorporating a 250 kW/10kHz IGBT solid state induction power source and Windows-based PC con-

trol. The scanner drive uses an AC brushless servo motor, providing some of the fastest scan speeds with the highest degree of positioning accuracy in the industry. Also featured will be the Dual Position Power Integrated Pop-Up Fixture with its integral 160 kW/30kHz IGBT solid state induction power source. This design incorporates three positions, allowing one position to load, a second to heat, and a third to quench. In addition, Radyne will provide a

hands-on demonstration of its Apex QA Quality Assurance Monitoring System. Finally, a pre-show press release suggests that "a few other surprises may be awaiting you at the Radyne booth."

Reishauer Corporation (Booth B1-7164) is demonstrating the RZ820, the biggest machine in the Reishauer product line. It is capable of efficiently grinding large, heavy duty gears to a very high quality level. This machine replaces all previ-

3 REASONS TO USE COLONIAL BROACHES



1 Precision round broaching tools with diameters as small as 1-in.



2 Big solid broaches up to 105-in. long and 12-in. diameter.



3 Helical broaches for transmission running gears.

If you're going by the numbers, Colonial Tool Group has all the reasons you need to have us be your broaching tool supplier. We've become one of North America's leading designers and manufacturers of high quality precision involute spur and helical broaches... big and small. And if you need broaching machines... we design and build those too!

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ous ZB, RZ701 and RZ801 machines. The RZ820 has improved software for increased productivity and improved positioning accuracy of the shift axis, which greatly reduces idle times. Hydraulic tailstock and on-machine fine balancing of the grinding wheel are two new features that enhance throughput.

Richardson (Booth B1-7164) will display the R200 CNC high production hobbers. The Richardson machine comes with

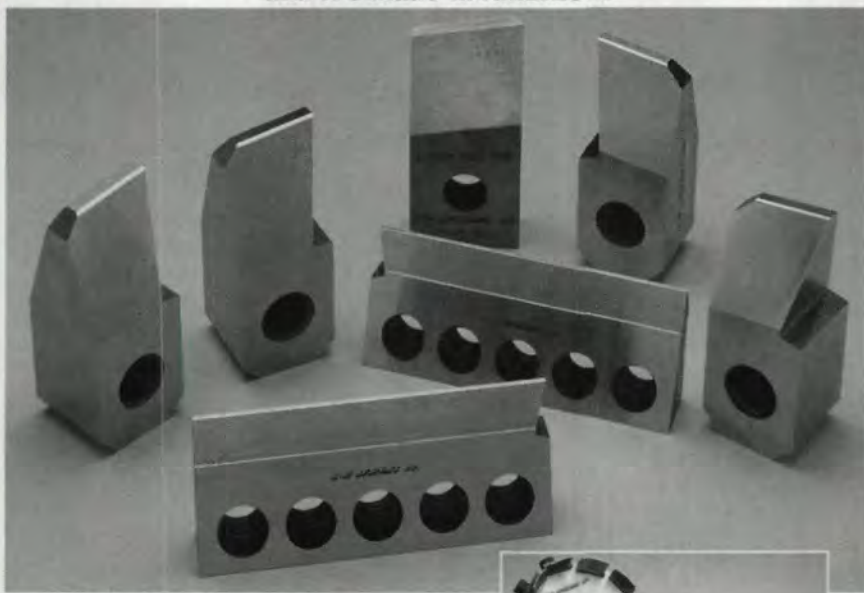
a modern 6-axis control coupled with the mechanical stiffness of all cast iron and all vee way construction. It has been configured to handle high helical jobs (-45° to $+60^{\circ}$) that are difficult to cut on competitive machines. As standard the R200 CNC can be used to mill or hob gears, and its compact design is intended to please equipment engineers.

S.L. Munson & Company (Booth B2-6555) will be displaying products

from Dr. Kaiser Precision Diamond Products Company and DWH Super Abrasives. They will display a complete line of rotary diamond dressers for all gear dressing applications; a new single- and double-side dresser design including an integral rotary root relieving tool for Reishauer SPA and Fässler DSA system dressing units; wear parts produced with polycrystalline diamond surfaces lapped to extremely close tolerances; CNC pro-

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We also can manufacture *new* spiral cutter bodies in diameters of 5" through 12" at present.

A/W can also supply roughing and finishing cutters, hardware and replacement parts for most 5"-12" diameter bodies.

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THE PAVILIONS

IMTS 98 features three new pavilions this year, bringing the total to 10 shows within the show. Below is a list of the pavilions and their locations in the McCormick Place complex.

Abrasive Machining/ Sawing/Finishing	B1 & B2	North
EDM	C1 & C2	North
Environmental Safety & Plant Management	C1 & C2	North
Factory Automation	D1 & D2	East
Gear Generation	B1 & B2	North
Lasers & Laser Systems	B1 & B2	North
Metal Cutting	A1, D2 & E1	S & E
Metal Forming & Fabricating	B1 & B2	North
Quality Assurance	D1 & D2	East
Tooling & Workholding Systems	E1	East

IMTS FUN FACTS

33 football fields of exhibit space



50 million pounds of equipment



11.8 miles of carpeting



\$550 million worth of metalworking
equipment on display

filing dressers; and rotary diamond dressers for plunge form applications. DWH products include examples of vitrified CBN and vitrified diamond wheels for precision grinding applications.

Schunk Inc. (Booth E1-2471) manufactures and sells a wide range of tooling products, including hydraulic chucks, hydraulic arbors, lathe chucks, chuck jaws, FUNDO—a new hydraulic dowel pin, and TRIBOS—a revolutionary new tool-holding system. Schunk also manufactures grippers for factory automation.

Sigma Pool (Booth B1-7170) will present three new machines, including the Liebherr-Emag hobbing machine, a Klingelnberg-Hoefler crank-shaft/cam-shaft inspection machine and an Oerlikon bevel gear tester. Also at the booth will be the Sigma Pool's full line of bevel gear generators, plunge shaving machines, shaping machines and the latest in dry cutting technology.

Star Cutter Co. (Booth B1-7182) will display Elk Rapids Engineering CNC sharpening machines as well as its full line of cutting tools, including hobs, milling cutters, pressure coolant & non-pressure coolant drills & reamers, solid carbide tooling and PCD tooling.

SU America (Booth B2-6657) will feature a CNC gear grinding machine, which the company says is accurate, flexible and affordable. It is a form grinder that can use ceramic and/or conventional grinding wheels. It can grind internal gears as well as externals and splines, and it has the latest-generation numerical controls. SU's entire line of gear cutting tools, including carbide hobs, will also be on display.



Modular Vertical Honing System (MVH) from Sunnen Products Company.

Sunnen Products Company (Booth B1-7303) will introduce the new MVH modular vertical honing system incorporating a menu driven industrial PC control. The machine comes in two modules to take advantage of either of Sunnen's honing tool systems. The single stroke honing module incorporates rigid, single-pass plated diamond tooling. The Krossgrinding™ module uses plated diamond in-process expansion tooling for

extremely precise roundness and straightness and control of bore size and finish. The Krossgrinding™ system also produces an oil-bearing crosshatch pattern. The two basic modules can also be combined for rough and precision honing in one unit. ⚙

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