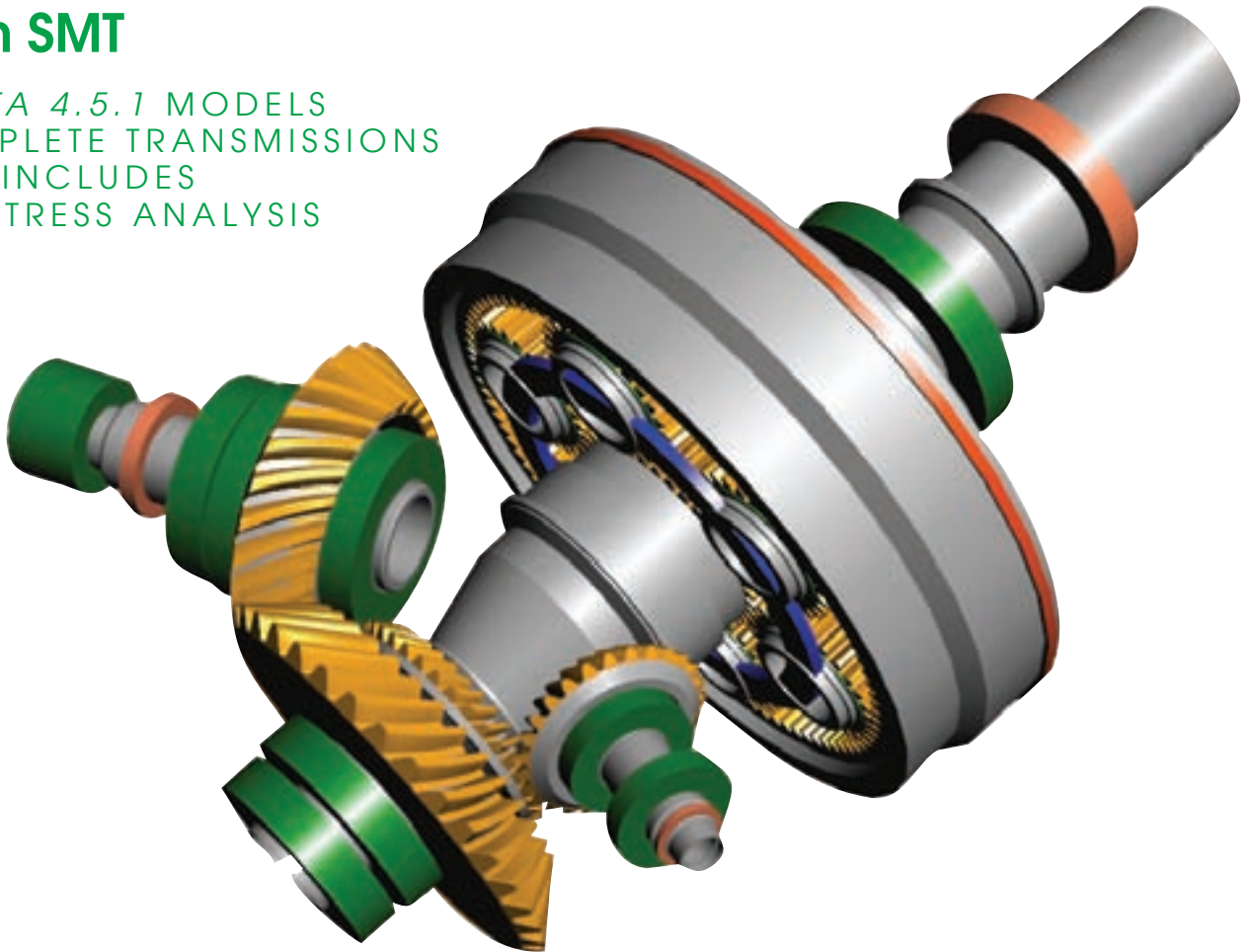


Design Unit Evaluating New Software from SMT

MASTA 4.5.1 MODELS
COMPLETE TRANSMISSIONS
AND INCLUDES
3-D STRESS ANALYSIS



Smart Manufacturing Technology (SMT) has announced the launch of *MASTA 4.5.1*. The software, which enables users to conduct fully integrated system analysis of mechanical transmissions, is undergoing intensive evaluation by the Design Unit at Newcastle University, U.K.

The Design Unit is widely recognized as an authority in gear design and manufacturing technology. The Design Unit has produced the *DU-Gates* program, which includes a 3-D analysis of a gear pair, enabling accurate prediction of root stresses and transmission error.

“The new *MASTA* software provides a 3-D gear stress analysis module whilst taking into account system deformations, and should therefore bring us closer to predicting the operating conditions on gears,” says Dr. Brian Shaw, director of Newcastle University Design Unit. “The *MASTA* software appears very powerful, and we are enjoying working with SMT to validate the gear stressing routines.”

MASTA can be used to model the full transmission system including bearings, shafts, gears and housings. “This integrated approach has made the software extremely popular,” says Dr.

Steve Brown, SMT’s sales manager.

The release of this latest version of *MASTA* software now means that engineers can design mechanical transmissions while taking account of the gear manufacturing processes to be used. They can now also conduct full 3-D, finite element-based analysis of the gear teeth. According to SMT, these features will significantly reduce the design and manufacturing development times and cost.

The gear manufacturing simulation modules allow manufacturing engineers to predict the requirements for gear manufacturing processes such as

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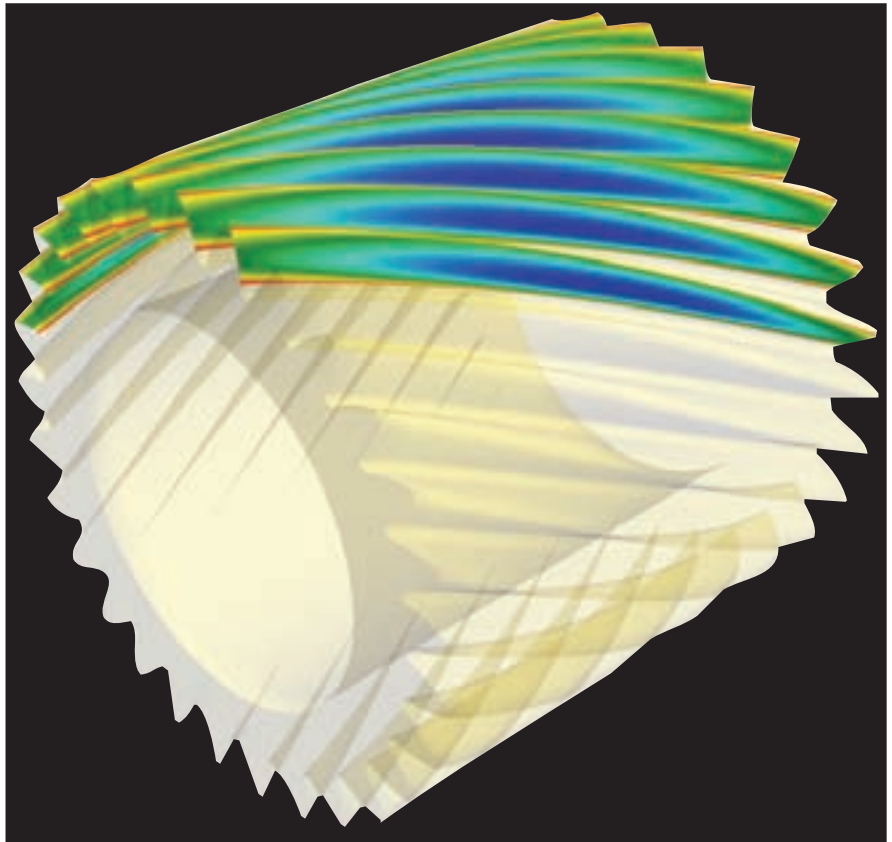
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hobbing, shaving, shaping and grinding. "Much of the time during gearbox development is spent solving gear manufacturing issues," says SMT director Dr. Changxiu Zhou. "Our software now allows most of these problems to be solved before metal is cut, saving our customers large amounts of time and money. This technology has been driven by demands from our customers to reduce the process development phase so they can get their products into the marketplace faster and more economically."

The Design Unit's evaluation of the MASTA 3-D gear analysis module goes beyond the commonly used gear standards such as ISO 6336 and AGMA 2001 to give a full 3-D stress analysis. "Accurate prediction of root and contact stresses for gears with high helix angles and contacts ratios is becoming evermore necessary," explains Shaw.

Advanced contact modeling of rolling element bearings ensures that the

calculated bearing deformations and contact stresses are accurate. This leads to a more reliable prediction of gear mesh misalignment, which is essential in determining in-service gear contact conditions.

For more information:

Smart Manufacturing Technology Ltd.
14 Regent Street
Nottingham, Nottinghamshire NG1 5BQ
England
Phone: +(44) 115-941-9839
Fax: +(44) 115-950-9278
Email: info@smartmt.com
Internet: www.smartmt.com

ONLINE

Product News is updated daily online. For the latest product information, go to www.geartechnology.com

Monnier + Zahner's Versatile MZ 130

PROVIDES SAME-SETUP GEAR HOBBING AND WORM MILLING



The MZ130 hobbing and worm milling CNC machine from Monnier + Zahner was designed with versatility and ease of use in mind. First rolled out at EMO 2005, and in 2006 at IMTS, the seven-axis machine's multiple capabilities include gear hobbing and worm milling for external spur, helical, face and straight bevel gears, as well as for worms, worm wheels, splines and threads. The MZ130 also features automatic, two-hob gear tooth deburring. The machine offers CNC-controlled conversion from gear hobbing to worm milling.

"The software has conversational programming that allows for fast switching from gear-hobbing mode to worm milling mode," says Troy Kutz, service engineer with Koepfer America, the U.S. distributor for Monnier + Zahner. "The Model MZ130 takes it one step further through its specialized tooling that allows you to hob and worm mill in the same setup."

Other machine capabilities and features include: hob head with CNC-controlled shifting; CNC-controlled, multiple-cut cycles; multiple-cut feed rates,

selectable via CNC; CNC-controlled dwell for worm wheels, blind splines, etc.; CNC-controlled electronic differential for hobbing of helical gears; machine-mounted hydraulic unit for workpiece clamping cylinder, etc.; and automatic lubrication system with shot tube for machine ways and re-circulation for the hob head and work spindle.

The MZ 130 accommodates large and small batches and includes a universal loader with workpiece magazine.

Available options include an eight-axis CNC synchronized tailstock, flexible automation system and automatic skiving.

Koepfer says the applications/markets best-suited for the MZ130

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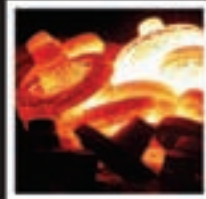
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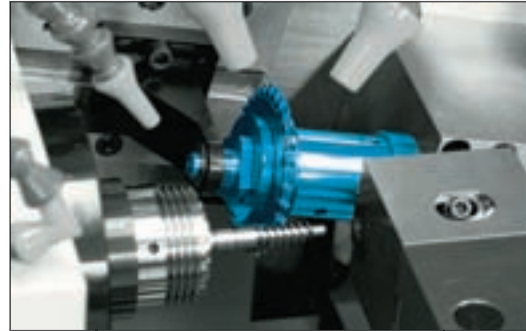


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include power tools, aerospace, fractional horsepower gear boxes and gear motors, as well automotive and contract manufacturing shops.

Maximum workpiece length for the MZ 130 is 250 mm (automatic loading) and 330 mm (manual loading); gear teeth length is 230 mm. The milling cutter diameter for hobbing is 16–40 mm, and 53–100 mm for worm milling.

CNC-controlled milling cycles include: straight, helical and crowned gearing; radial, radial-axial, climb and conventional milling, roughing and finishing; worm wheels, straight toothed bevel wheels, worms, front-end toothing; and tailstock (W-axis) following the milling cutter synchronously (Z-axis).

For more information:

Koepfer America, LLC
635 Schneider Drive
South Elgin, IL 60177
Phone: (847) 931-4121
Fax: (847) 931-4192
E-mail: sales@koepferamerica.com
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Mahr Federal

UNVEILS LARGER AND MORE FLEXIBLE MEASUREMENT SYSTEM

The new MarForm MMQ 400 Formtester from Mahr Federal is a ground-up redesign which is more robust, less sensitive to environmental influences, faster, more flexible and more accurate than earlier versions of the company's measurement systems. In addition, the MMQ 400 offers features, including solid construction with a generously dimensioned, reinforced steel base. All mechanical components have been optimized in CAD with finite element methods, and all motors and electronic components have been thermally isolated. Wherever possible, homogeneous materials were used in construction to minimize the effects of thermal expansion.

The MMQ 400 is also larger and more flexible than its predecessor and can measure parts up to 60 kg (132 lbs.) in weight. The Z-axis has also been redesigned, making it more stable and improving both accuracy and repeatability of measurements. Despite its size increase, the overall footprint of the unit is smaller than comparable instruments, as the controller and other electronics have been completely integrated into the design.

The MMQ 400 eliminates the need for an air supply by using a high-precision mechanical bearing for the rotary table. According to the company's press release, the mechanical bearing used in the MMQ 400 is up to 70 times stiffer than most bearings, making the system less susceptible to external forces, such as vibration.

Two versions of the MMQ 400 Formtester are available, one with a 350 mm Z-axis and 180 mm X-axis, and the other with a 500 mm Z-axis and 280

mm X-axis. All measuring axes are fully motorized, and they can be equipped with a selection of available probes, including the T7W 360° motorized by-directional probe, and the manual T20W probe, which further enhances measuring flexibility.

Fully controlled by Mahr *MarWin*

software, the MMQ 400 can evaluate all standard form parameters, including roundness, sector roundness, run-out, sector run-out, concentricity and coaxiality, total run-out, cylindricity, straightness, section-by-section straightness, parallelism, perpendicularity, angularity, flatness, conicity, and taper. The system

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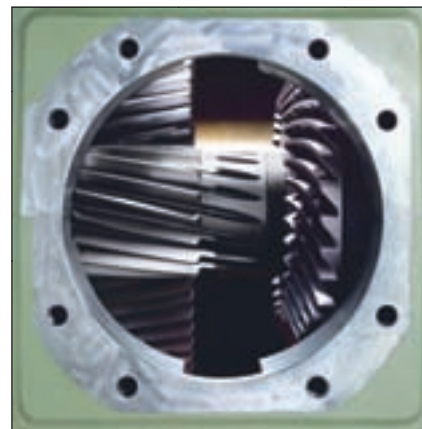
has been especially designed to measure a wide variety of workpieces, including injection components, ABS components, valves, pistons and piston rods, crankshafts and camshafts, brake disks, gear shafts, ball-bearings, and more.

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Internet: www.mahr federal.com

New Industrial Gear Oil

ENHANCES
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DURABILITY



The new Mobilgear 600 XP Series of premium industrial gear oils was introduced by ExxonMobil.

According to the company's press release, the gear oil is formulated to minimize wear and enhance the performance of all critical gearbox components, including gears, bearings and seals. ExxonMobil says the gear oils surpass the industry's most demanding specifications, such as Flender BA Table 7300 A, DIN 5157 Part 3 and AGMA 9005 E02.

Mobilgear helps control micro-pitting and other forms of gear wear. Its balanced formulation improves bearing and corrosion protection while remaining compatible with many commonly used gearbox sealing materials. The oil is also designed to reduce the formation of oil degradation byproducts that require frequent oil changes.

For more information:

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Weight Savings — As a blank, this large spur gear weighed 55 lbs. As a forged tooth gear with 1 millimeter of stock on the tooth profile for hobbing, it weighs just 37 lbs.



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KISSsoft AG and GEARTECH Software introduced a new and updated version of *GEARCALC*, a gear design program originally released in 1986.

GEARCALC requires minimal input data and prompts the user to enter the application, load, material, and heat treatment data for a gearset.

GEARCALC designs maximum-capacity gearsets that have minimum volume and weight. Profile shift coefficients can be selected to maximize pitting and wear resistance, and scuffing resistance or bending strength.

AGMA 2001, which replaces *AGMA 218*, rates gears exactly as intended by the American Gear Manufacturers Association Standards “ANSI/AGMA 2001-D04 and ANSI/AGMA 2101-D04, “AMERICAN NATIONAL STANDARD, Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth.”

AGMA 2001 performs the following analyses:

- Life Rating—Given the transmitted power and speed, the pitting life and bending fatigue lives are calculated for a single load and speed, or for an entire spectrum of loads and speeds with the resultant lives determined from Miner’s Rule.

- Power Rating—Given the pinion speed and required design life, the allowable transmitted power based on gear tooth pitting and bending fatigue is calculated for both the pinion and gear. The allowable power rating of the gearset is the minimum of the four power capacities.

AGMA 925, which replaces *SCORING+*, rates gears exactly

as intended by the American Gear Manufacturers Association Information Sheet *AGMA 925-A03*, “AGMA Information Sheet, Effect of Lubrication on Gear Surface Distress.”

AGMA 925 performs a complete analysis of the tribology of spur and helical gears. It calculates the EHL film thickness using the Dowson and Toyoda equation and the flash temperature using Blok’s critical temperature theory.

AGMA 925 features include:

- Calculation of EHL-specific film thickness and probability of wear.
- Calculation of total contact temperature and probability of scuffing.
- Calculation of rolling, sliding, and entraining velocities, and specific sliding (slide/roll) ratios.
- Calculation of Hertzian contact stress.
- Screen and hard-copy plots of specific sliding, Hertzian stress, film thickness, specific film thickness, and contact temperature.
- Programs *GEARCALC*, *AGMA 2001*, and *AGMA 925* work together in a seamless integrated system that has been optimized using state-of-the-art technology to simplify gear design and analysis.

The software is available as a stand-alone package, or integrated into the CAD programs *Inventor*, *Solid Edge*, *SolidWorks* and *Pro/E*.

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Midwest Motion's New Control

FEATURES BUILT-IN REVERSING SWITCH AND SPEED ADJUST POTENTIOMETER

Midwest Motion Products Co. released the MMP20A-24V-RSP motor speed control module. The modular design includes a solid-state PWM switch device that provides bi-directional, open loop, DC motor speed control.

According to the company's press release, the control delivers 20 amps continuous current at 24 VDC with



a 20–36V range. Measuring 4.5" x 3.1" x 1", the control can achieve the current required to power most brushed DC motors by delivering 240 watts of continuous output power. The latest design enhancement ensures up to 40 A of peak (momentary) current for a peak output power capacity of 480 watts.

The design is enabled to meet the IP-65 standard rating for resistance to harsh environments. The outer casing is brushed aluminum, and two 1/4" diameter thru-holes are provided for easy mounting to any flat (heat sinking) surface. Sets of four "quick connect" terminals are provided for connecting to power.

The control is designed for operation in applications including pumps, gearmotors, automotive and transportation industries, conveyors, food processing and others.

For more information:

Midwest Motion Products
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shafts and camshafts is introduced by Adcole Corp.

The Adcole Model 1200 crankshaft-camshaft gage features proprietary refinements to the spindle, including significant components and subsystems to achieve accuracies for roundness of better than a quarter micron (0.25µm) for measuring pin journals. This exceeds the 10% rule of the new 2.5 micron roundness tolerance now being introduced by engine manufacturers, according to the company's press release.

Capable of measuring pin journal roundness, cylindricity, straightness, parallelism, diameter, taper, radial runout, concentricity, and other critical parameters, the Adcole Model 1200 crankshaft-camshaft gage incorporates a laser interferometer measurement system and is built on a base of structural steel. Applications include machine tool performance verification, manufacturing process control, and final parts inspection.

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New Makino

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Makino introduced the G5 Grinder horizontal machining center, capable of grinding, drilling, boring and milling

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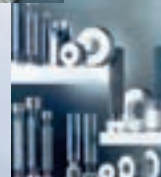
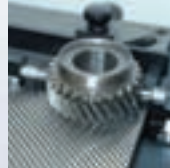
All functional checks can be displayed on the rugged E9066 industrial PC system which offers a linear graphic display with full SPC functions.

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one machine, you're not only saving on capital equipment but you're also able to keep the part in the machine, eliminating all the out-of-cut time that does nothing but add to your costs and lead time."

According to the company's press release, the G5 is a full five-axis machine, with a B-axis of 0.5/1.5 sec

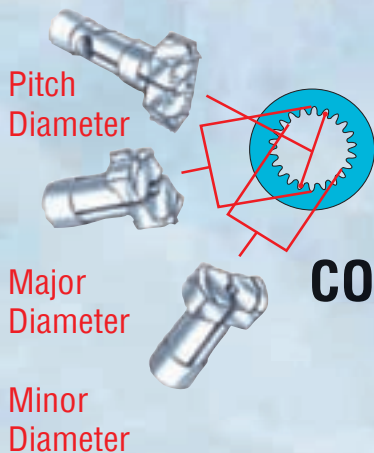
(90/180), a C-axis at 100 rpm and a 60-tool automatic tool changer that will hold up to a 8.7" (220 mm) diameter grinding wheel.

A two-axis coolant nozzle allows the G5 to accommodate variations in wheel diameter and changes in cutting direction while maintaining specific cutting conditions. It also allows for



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intermittent rotary dressing, an NC-controlled, hydraulically powered feature that redresses the wheel to reestablish profile geometry on the cutting wheel.

The G5 features one-piece X-, Y- and Z-covers, proven I-Series tool changing systems, and a 10-micron cyclonic secondary filtration.

Features that assist with thermal stability include an integral spindle with the cooling jacket linked to the bed temperature for part consistency, a coolant chiller to maintain high-precision machining, core-cooled ball screws in all axes, and the use of high-volume, high-pressure coolant.

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