

LMT Fette Introduces SpeedCore

TECHNOLOGY
ALLOWS FOR MORE
EFFICIENT AND
FLEXIBLE HOBGING



In today's gear manufacturing environment, flexibility and efficiency are key factors in modern machine tool technology. Productivity improvements, including state-of-the-art gear cutting machine tools, allow higher cutting speeds by up to 30 percent. While most of the machines are already designed to utilize car-



bide hobs and work under dry conditions, the newly developed material SpeedCore by LMT Fette, is now at the stage to accelerate the machining conditions dramatically—for the benefit of the customer.

“The core of the new SpeedCore material is made out of carbon-free iron, cobalt and Molybdenum,” says LMT Tool Systems’ Thomas Falk. “This new composition as well as the powder metallurgy manufacturing method allows an increase in high temperature hardness of the material compared to the traditional PM-HSS materials. The hardness of this material is generated by special nanostructures, which are in an intermetallic state.”

Higher cutting speeds increase the mechanical and thermal loads of the hob. While HSS materials are limited to a range of cutting speeds due to their limited high temperature hardness, SpeedCore hobs are manufactured out of this new cutting material, which overcomes the barriers of high temperature hardness while at the same time offering sufficient toughness. “With hobs using the new SpeedCore material, the cutting speed increases, the customer gains significantly more parts in less time and the machine tools will be utilized more efficiently,” Falk adds. “Nearly no additional investment is necessary to increase the productivity, just the new SpeedCore material.”

LMT Fette has tested the capability with the support of the Technical University of Magdeburg. The newly developed material was tested at cutting conditions normally used for solid carbide hobs. The results prove the high temperature resistance of SpeedCore. In the laboratory tests machining real components, the SpeedCore materials were used at cutting speeds up to 350 m/min without any thermal overload of the cutting edge. The tool length achieved 7 m; these are conditions where PM-HSS materials would fail. In real-world applications, these results in the manufacturing environment mean customers can increase the cutting speed more than 30 percent to improve the efficiency of the gear cutting process. There are two options: the cutting speed is increased to achieve a predetermined tool life, or the process is adjusted to the capability of the SpeedCore material. The customer will achieve in both cases lower costs per workpiece.

The launch of the new cutting material means LMT has taken another step in developing its gear-wheel production system. Following the Nanosphere coating, launched less than two years ago, the SpeedCore cutting material is another technological breakthrough. The LMT hob

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cutter system includes not only coatings and cutting materials, but also application-specific engineering and services like LMT's global reconditioning and coating network. Its centers in China, Germany and the United States enable LMT to guarantee it will recondition hobs to original manufacturer quality for users worldwide. The new hob generation was officially launched in Germany in June as part of a specialist gear-cutting symposium in Schwarzenbek. "SpeedCore made its international debut at EMO Hannover in September, where we also introduced the start of a much larger product range," Falk says.

LMT Fette also presented a new cutting material at EMO Hannover that has been specially developed by its alliance partner Boehlerit for milling applications. Nanosilver, a nano-structured coating, has been applied to three new carbide substrates. The new TeraSpeed coating substantially improves the performance of LMT indexable inserts. The aluminum titanium nitride coating system offers a high level of thermal resistance of up to 1,100 degrees Celsius—200 degrees higher than comparable coatings. The XChange threading tap combines the advantages of carbide and high-speed steel: equipped for internal cooling, the tool is capable of twice the cutting speed of a conventional HSS tap. LMT presented a coating for thread rollers in the shape of Protec, an innovation that will expand the range of thread-rolling applications. The elastic and flexible thin-film coating has been specially designed for processing hard materials and increases tool life by up to 30 percent. In addition, LMT is pooling more than 50 years of experience in the machining of composite materials as part of its Composite Excellence initiative.

The main focus at EMO, however, was on SpeedCore and its various advantages, including higher productivity, higher operating safety, easy

implementation on older machines and the resharping and recoating options available.

"Speedcore has been incredibly successful in applications regarding productivity and tool life," Falk says. "The target is the increase of productivity in the gear wheel production and to guarantee a process security."

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Zenith

**OFFERS MULTIPLE
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Holroyd Precision Ltd. recently launched a new machine capable of using three grinding technologies at EMO Hannover. Holroyd's new Zenith machine combines the technologies of aluminium oxide, Electro plated CBN (cubic boron nitride) and vitrified (dressable) CBN. The Zenith

machine will have the capacity to grind some of the largest rotors in the industry at 420 mm and offer the flexibility to use tooling from customers' existing grinding machines. This is a new generation of grinding machine technology, encompassing modern innovations, coupled with an easy feel control system that incorporates both a development and production software suite to suit all potential user requirements in either research and development or mass production.

The Zenith machine is an extremely compact machine that gives high loop stiffness, good thermal resilience and rigid workholding. The machine's increased capacity can accommodate components up to 420 mm. in diameter. Thanks to careful orientation of axes and guide-way layout, overall length capacity could be increased with a reduction of machine footprint. Use of a single-piece iron casting using precision ground linear guide-ways removed traditional constraints regarding the orientation of the guide-ways.

Ease of access is significantly improved through a unique slideway design. A software 'wizard' guides the operator smoothly and efficiently through the CNC programming without the requirement for high levels of expertise while still offering options for personal operator control. Operator-free coolant application eliminates the possibility of human error. An inductive flute-finding probe

allows rapid orientation of the part.

Simultaneous probing of both journals measures the run-out of the blank before grinding. Workpieces are automatically loaded and extracted. Power-assisted doors provide easy access at the touch of a button. Fast mist extraction prevents coolant mist from escap-

ing into the workshop when the doors are opened. Full automatic vitrified wheel balancing and radio frequency identification chips and reader make the operator's life easier still. Dresser touch detection enables the machine to locate the position and profile of

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the grinding wheel to ensure economic dressing.

“The development of the new Zenith machine has provided an exemplary case study of the way in which we like to operate here at PTG,” says Rod Macdonald, managing director of Holroyd Precision. “By taking as our

starting point the concerns and considerations of our customers through a thorough and exhaustive market study, we believe that ultimately we have been able to develop an entirely new generation of helical grinding machines to satisfy the demanding needs of accuracy and versatility on

the one hand and productivity and ease of use on the other. While the important and newly-emerging consideration of energy efficiency was also a very important factor in the development of what we believe to be a truly groundbreaking machine.”

For more information:

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Advanced Machine

INTRODUCES DOVE-TAIL VISE CLAMPING COMPONENT



Advanced Machine and Engineering Co., located in Rockford, Illinois, recently introduced a new dovetail vise clamping component, the newest addition to their line of fixturing and workholding products. The dovetail vise is widely used in the aerospace industry for aluminum milling operations, but can also be used for many other applications. Benefits include: precision bushing holes allow

for quick and easy location of vise, 1/2"-13 SHCS and precision dowel screws are used to secure vise on 2" grid system, a 15 degree dovetail angle that holds pre-machined parts securely during machining operations, maximum part width 4" or 5", vise available in 5", 8", 12", 16" or 24" lengths, up to 12 jaws, depending on vise length and metric locating and mounting hole version available on request.

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Advanced Machine and Engineering
2500 Latham Street
Rockford, IL 61103
Phone: (815) 962-6076
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power chuck fixtures with built-in type cylinders are also utilized for machining applications. These chucks provide a gripping force range up to 44 kN (9,891 lb-f) on smaller models and up to 142.1 kN (31,945 lb-f) on larger models for heavy-duty cutting. Other features include rust-proof cylinder and

dust-proof and waterproof structure. Chandox super thin manual chucks and chucks for quality measurement and gaging are also available. Various models and specifications are offered. Hard jaws and soft jaws can be used alternatively. A chuck flange

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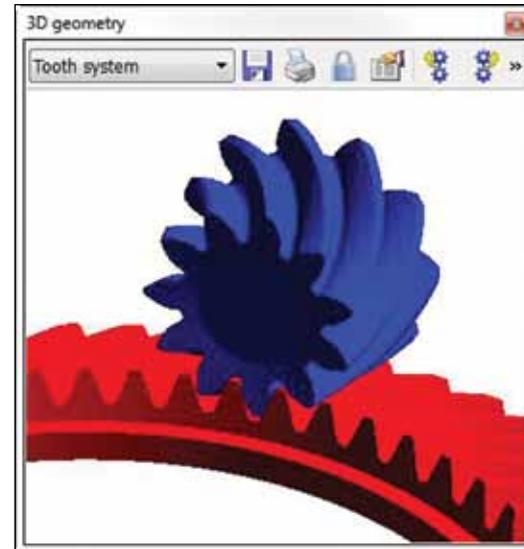
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KISSsoft

RELEASE INCLUDES EXTENDED 3-D MODELS

Another highlight in the current *KISSsoft* Release is the extended 3-D models. 3-D models are now available for spur and helical bevel gears as well as bevel gears with spiral teeth. Based on the bevel gear geometry calculation according to ISO 23509, 3-D models after Gleason and Klingelnberg (*module ZC10*) can now be designed. There is a very good correspondence achieved with reference software. The position of the contact pattern can be influenced through various flank modifications and tested by the designer by using the contact line in the load-free state. Finally, the models can be exported in *STEP* or *Parasolid* format (*module CBI*) and used for further application on five-axis milling machines. Furthermore, models for worms with worm wheels (*module ZD10*) are now available.

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Index

**INTRODUCES
 MULTI-SPINDLE CNC
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The new Index MS40P CNC multi-spindle automatic lathe includes a quillstock with six tool carriers and one counter spindle opposite the main six-spindle drum, making it possible to machine complex workpieces requiring many tools with highest precision in a single process. A new concept, the Index multispindle affords contract



manufacturers the ability to outproduce—by up to 85 percent or more—six or more twin-turret CNC lathes with a single, flexible, high-speed, high precision machine that can work unattended over three shifts. The flexibility and capability of the machine is

well-suited to batch production and for machining families of parts; the front and rear end machining options permit efficient, complete machining of production parts with complex geometry and/or extensive operations on the cutoff end. The core of the machine is

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its compact spindle drum. Six fluid-cooled, infinitely variable hollow-shaft motors are able to drive up to 40 mm bar stock independently from each other. Other characteristics of the spindle drum are: high torque, small frame size, maintenance-free operation, and an advanced synchronous design. The

enhanced machine concept is based on the added A-side (drum side) and an opposite quillstock on the B-side.

Besides the tool carriers in the spindle drum side of the machine, another six tool carriers and a counter spindle are located in the rigid monoblock quillstock. The tool carrier

arrangement in the working area without a longitudinal slide block allows the use of more than one tool on each spindle. The generously dimensioned working area can be easily accessed through sliding doors on both sides of the machine. This is very convenient for the user and greatly reduces setup time. Chips drop directly into the base of the machine.

The Index modular system allows, on the A-side, customer-specific configuration of up to 12 hydrostatic bearing-supported CNC cross-slides, several Y-axes, and numerous stationary and live tools (for front-end machining), permitting a wide range of machining in a single setup: off-center drilling, deep-hole drilling, thread cutting, inclined drilling, cross drilling, contour milling, hobbing, and multi-edge turning are only a few of the many possibilities. The characteristic Index V-shaped arrangement of the tool carriers means the optimum machining sequence is the only factor determining the process. For example, external and internal machining operations using stationary or live tools can be performed in every station.

During machining, users can program the optimum speed for each independent spindle which can be varied during cutting. The result is excellent surface quality, short production times per piece, and extended tool life. It is also possible to make speed changes during drum indexing, thus avoiding any additional secondary processing times. This capability also makes it possible to machine difficult materials that previously were hardly suitable for multi-spindle machines.

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Renishaw Probe

Allows Fully Automated Measurement on CMMs

Renishaw has added a new probe option to its Revo five-axis measurement system, which for the first time, allows surface finish inspection to be fully integrated within CMM measurement routines. With a measurement capability of 6.3 to 0.05 Ra, the SFP1 surface finish probe provides a unique 'single platform' that will eliminate the need for handheld sensors, or the necessity to move parts to costly dedicated surface finish measuring machines, reducing labor costs and inspection lead times. CMM users will now be able to automatically switch between part scanning and surface finish measurement, with analysis all contained in a single measurement report. As a fully integrated option for the Revo five-axis measurement system, users of the SFP1 surface finish probe will benefit from a range of powerful features that will boost inspection speed and flexibility.

The probe incorporates a C axis, which combined with the infinite posi-

tioning capability of the Revo measuring head and a choice of styli, allows the probe tip to be automatically orientated to any angle to suit the part, ensuring that the highest quality surface data is acquired. The SFP1 is supplied with two dedicated styli, the SFS-1 straight stylus and SFS-2

cranked stylus, which are selected under full measurement program control using the Revo system's modular rack system (MRS). This enables flexible access to component features combined with the consistency of a fully-automated CNC methodology.

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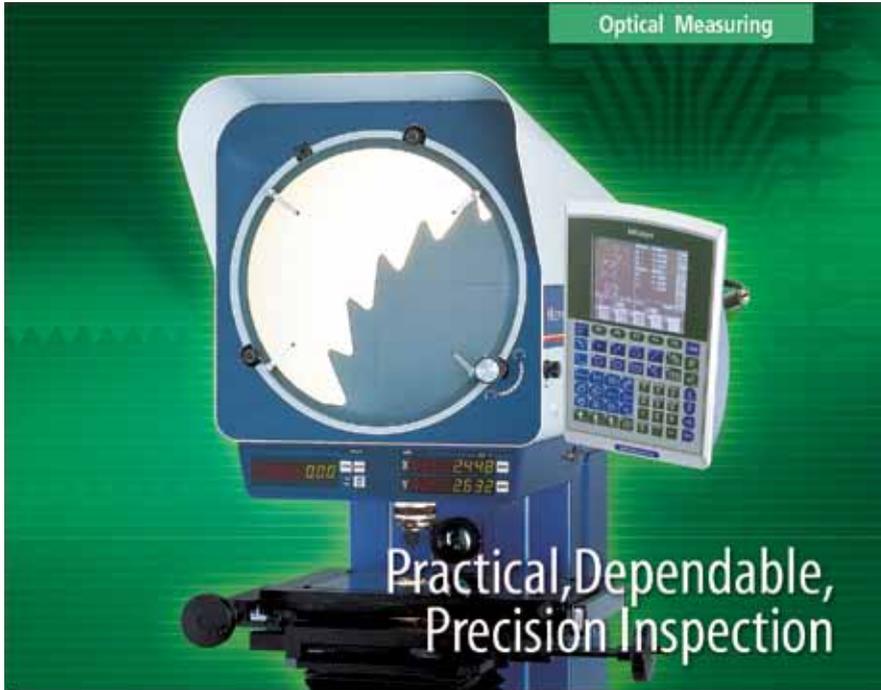
A skidded probe type with a 2 μm (0.000079 in) tip radius diamond stylus, the SFP1 surface finish probe outputs Ra, RMS and raw data formats to the metrology application client software via Renishaw's *UCCServer* software using the I++ DME protocol. The raw data can subsequently be

presented to specialist surface analysis software packages for further detailed reporting. Calibration of the sensor is also automated and carried out within a CMM software program. A new surface finish calibration artifact (SFA) is mounted on the MRS rack and is measured using the SFP1 probe. Software

then adjusts parameters within the probe in accordance with the artifact's calibrated value.

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nier dial up to +/- 20 degrees. Software for gear hobbing is an option on most turning centers. Having a compact design, the system, in most instances, operates without interrupting its neighboring tool stations in a machine turret. Other comparable systems often require the room of two tool positions. Built for heavy machining loads, the gear-driven Exsys/Eppinger gear hobbing system has been designed for 45 N-m of torque and speeds of up to 3,000 rpm for hobs or slotting saws up to 2.480 dia. (63 mm). Arbor diameters are available for all standard sizes for use of both slotting saws and gear hobs. Changing tools takes just seconds by removing the yoke plate and sliding out the arbor. The base of the tool holder remains in its station.

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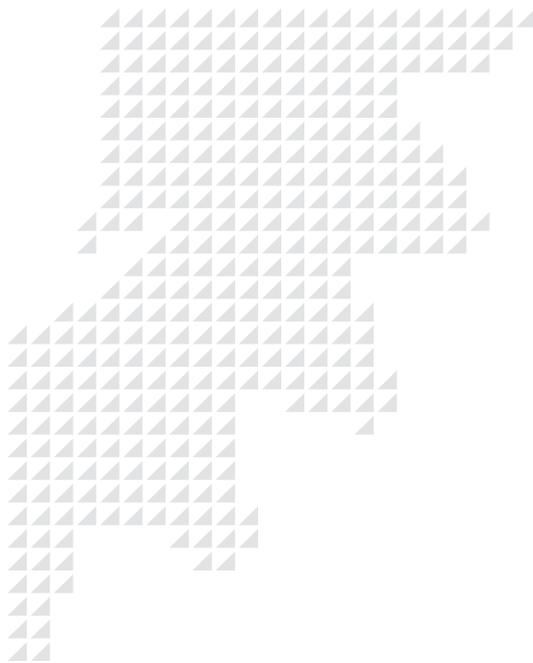
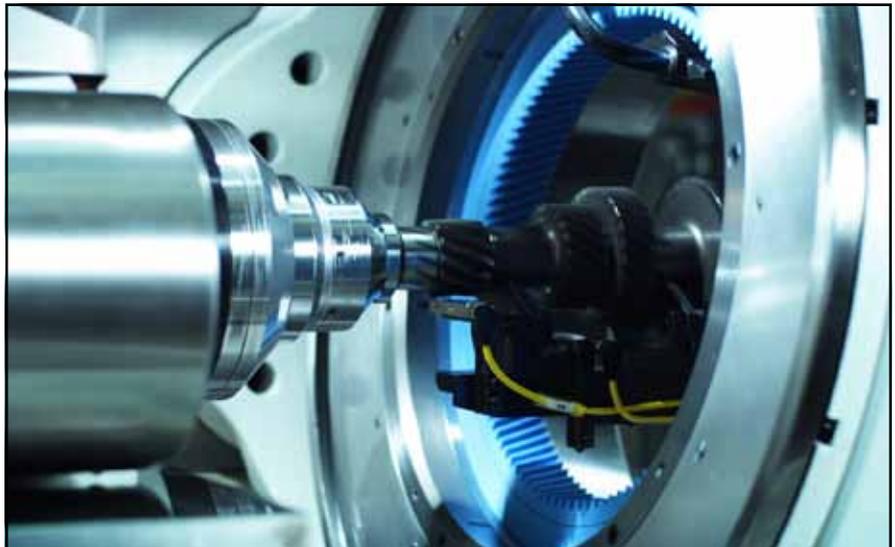
Schunk continues to expand its range of modular long-stroke electric grippers with the LEG 400, which can be used in the metal cut-



ting and automotive industry, along with assembly and handling tasks. This weight-reduced, lightweight gripper is equipped with a servomotor and has a gripping force of up to 1,050 N as well as a variable stroke between zero and 103 mm. Having only one motor, it weighs 6.5 kg.

Designed according to the modular principle, the LEG gripper can be equipped with a pneumatic and electric drive. The user is able to choose the servo motor as desired. Robot manufacturers can thus use their own motors and control the gripper with the same

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set of commands as the robot. In addition, the applicable forces can be measured and controlled with servo-electric drives. If the LEG is operated with a single servomotor, both drive spindles are coupled and the fingers move synchronously. With two motors on

the other hand, the fingers can move to any position in the gripping range independently of each other.

The modularity of the LEG goes even further; both slides and guided slides as well as the supporting lateral cheeks and the connecting ele-

ments are available in different sizes and versions. The LEG gripper can thus be adapted economically to the corresponding task and load. Optional sensors or image processing systems make it a sensitive tool in the production, assembly, and packaging processes. A change system that can be used to change the fingers manually or automatically provides the user with additional flexibility. Due to the low weight of the LEG gripper, excellent acceleration and high speeds are possible, and thus shorter cycle times and a higher overall power. Alternatively, smaller actuators or robots can be used with identical cycle times. That saves energy, protects the environment and reduces running costs.

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