Klingelnberg

HIGHLIGHTS COMPLETE PORTFOLIO AT CONTROL 2019

Headlined as "Control 2019 — Networking Science and Actual Practice," the 33rd international trade fair for quality assurance took place in Stuttgart from May 7–10, 2019. The solutions provider's "exhibition trunk" included the P16, P26, P40, and P100 G precision measuring centers, featuring an optimized machine design. This year's show highlights included gear measurement for cylindrical gears using the closed loop method, the new hybrid technology for tactile and optical measuring technology, and solutions for measurement tasks beyond gear measurement.

P16 — Precise measurement with closed loop technology for cylindrical gears

In extending the closed loop concept already established at Klingelnberg for bevel gears to the world of cylindrical gears, the machine manufacturing firm has linked machine tools to the measuring machine in this sector too. Thanks to a wide variety of associated applications and software, Klingelnberg has created a central production control system that standardizes machining results achieved on different machines, and even in different plants. Closed Loop thus uses a modern software architecture to allow data to be exchanged between design, production, quality assurance and statistical evaluation, and also actively to bring information to the consumer or, in a later development stage, to initiate process steps automatically. This totally integrated digital data exchange reduces the risks of error and guarantees complete reproducibility of all processes.

P26 — Hybrid technology: combining optical and tactile measuring technology

The standards in gear measuring technology are extremely high, requiring accuracies in the nanometer range on the one hand, and short measuring times with a higher information density on the other hand. To meet this challenge, Klingelnberg launched a new hybrid technology in 2018 that combines the advantages of both tactile and optical measuring technology. The advantage of rapid sampling by the optical sensor is combined with the flexibility and extremely high accuracy of the 3D Nanoscan tactile sensor system. This ensures that the new, highly appealing potential of optical measurement can be utilized without compromising the measuring accuracy. The hybrid system is designed so that the optical sensors can be adapted in a variety of ways. Klingelnberg avoided committing to one sensor principle only. Thanks to a high-speed scanning sensor, any number of axially symmetrical components can be digitized through rapid scanning with an extremely high point density. The "Optical Measurement" option includes the Highspeed Optoscan optical sensor with a rapid change feed unit, the software for sampling and visualizing the measured point cloud, and the GOM-3D evaluation software.

P100 G — Measurement tasks beyond gear teeth

The 100 "G variant" Klingelnberg Precision Measuring Centers are specifically designed for measurement tasks beyond gears, making them well-suited for measuring axially symmetrical components. The software for standard dimensional measurement tasks and form and position measurements included in the machine's scope of delivery also covers special evaluations such as Fourier analysis. In addition to dimensional measurement tasks, even complex contour and surface measurements can be measured in a single clamping. This is ideal in particular for the high precision requirements in the automotive and commercial vehicle industry, as well as in mechanical engineering and plant engineering. But this range will also appeal to all manufacturers of rolling bearings.

That is because it enables rolling bearings and rolling bearing elements to be accurately analyzed and measured to an extremely high degree of precision. The particular advantage lies not only in the high-precision form measurement but also in the capability of performing roughness measurements (both internal and external) fully automatically in the integrated measuring runs, even on large components. Based on the manufacturer data and specifications, measuring runs are created automatically with conclusive protocols based on current standards and regulations. The series variations and quality grades of the bearings are fully supported by Klingelnberg software. Additional measurement tasks based on specific requirements of the bearing manufacturer can also be implemented with ease.

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P40 — Proven solutions for gear measurement

Klingelnberg presented the P40 series of precision measuring centers for small diameter ranges to the international audience in Stuttgart — optimal solutions for quality management processes on gears that are guaranteed to ensure future success. The machine and software concept of the Pseries is optimized for measurement of complex drive components. The technology replaces up to six conventional measuring machines: gear measurement, general coordinate measurement, optical measurement, form and position measurement, roughness measurement, and contour measurement. These measurement tasks can be fully automated in a single clamping.

All machine models can be enhanced with custom options and feature specifications that make them ideal for performing measurements in the production environment. Klingelnberg Precision Measuring Centers stand out for their patented, high-precision 3D Nanoscan probe system as well as their easy-to-use roughness probe systems for external and internal measurements. This solution brings Klingelnberg close to the market, and the user. The P series is a widely used standard in the industry — for good reason — and also serves as a reference for metrology institutes.

Klingelnberg also presented its services and software solutions, alongside the measuring centers. As usual, Dr.-Ing. Günther Gravel, Head of the Institute for Production Technology at the University for Applied Sciences (HAW Hamburg) was on site as a measured value analysis expert.

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KISSsoft

PROVIDES ADDITIONAL SOFTWARE TOOLS FOR GEAR MANUFACTURING

KISSsoft provides a number of useful tools for gear manufacturing throughout the design process.

When grinding helical gears an unwanted production-related twist is generated. This twist can be simulated in advance in the *KISSsoft Release 03/2018* (module ZY6), and the influence on the flank contact can be evaluated with contact analysis.

When designing hardened and ground gears, the grinding notch must be taken into account with regard to position and rounding radius in order to avoid stress concentrations. In addition to the ISO 6336 standard and FEM in 2D (module ZA24), *KISSsoft* also provides evaluation with FEM in 3D (module ZA37): This evaluation is based on the exact load distribution over the tooth width and enables the consideration of crowning and axial misalignments with respect to the load distribution, which results in a much more precise analysis of the stresses over the tooth width.

With the use of protuberance hobs, the grinding notch can be avoided or significantly reduced. The protuberance can be specified in *KISSsoft* on the reference profile as well as on the tool (hobbing cutter, cutting wheel), and checked

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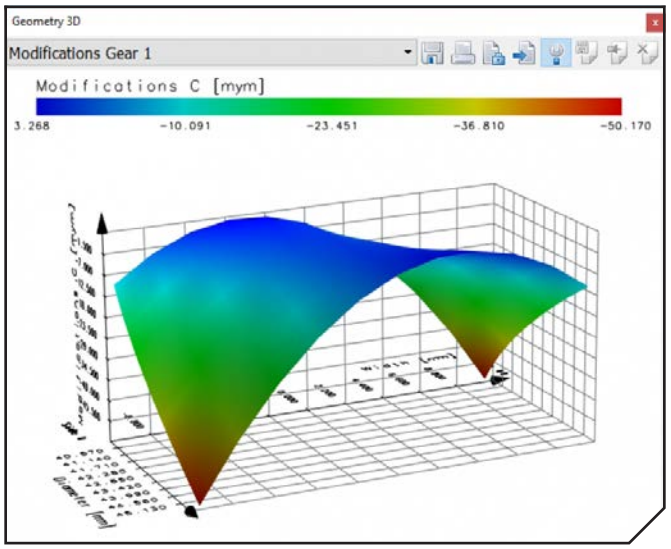

in numerous graphics for gear teeth, tools and production.

For more information:
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Helios Gear Products

INTRODUCES HERA 90 CNC GEAR HOBBING MACHINE

Helios Gear Products (formerly Koepfer America) now exclusively offers the Helios Hera 90 CNC gear hobbing machine from YG Tech for the North American market. This gear cutting solution provides high technology features such as FANUC 0i-MF control and servo motors, direct drive hob and work spindles, Heidenhain linear scale on X-axis for precise repeatable control of size, and more. Gear manufacturers will appreciate this hobbing machine for its unique combination of technical capabilities, market-beating price, and proven domestic support.

"The Hera 90 is the first of the Hera series to meet the demanding needs of our customers, and this includes not only a globally competitive price point but also a complete hobbing solution backed by industry experts for technical support," said Adam Gimpert, business manager at Helios Gear Products.

The Hera 90 offers key features, such as 8.5 DP (3 mn) pitch rating, 6,000 rpm maximum hob speed, and up to 8 CNC axes. When equipped with the optional gantry loading and unloading system, the Hera 90 capably and productively hobs a variety of gear types. Workpieces up to 12.600" (320 mm) length can be manually loaded or 7.874" (200 mm) length automatically loaded. Centerline distance between cutter and work spindles moves between 0.394" (10 mm) and 3.937" (100 mm), providing the capacity for a wide range of gear sizes. With 6.300" (160 mm) hob shift, job shops and end-product gear manufacturers alike must consider this machine's productive mix of flexibility and capability in a small footprint.

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Several standard capabilities are available via the Hera 90's dialogue programming: one and multiple gears on a single workpiece, multiple-cut cycles, any combination of radial, axial, climb, or conventional hobbing, crowning (lead modification), automatic shifting over a broken hob section, CNC hob shifting, and burr-free hobbing using two equal hobs. Straight bevel gears can also be cut by index milling or generating cutting via the Conikron method.

"In today's globally competitive market, gear manufacturers need a cost-effective, highly capable, yet versatile hobbing solution for fine-pitch gearing. The Helios Hera 90 fills this role like nothing else on that market," said David Harroun, sales manager of Helios Gear Products.

Construction features of the Hera 90 prove strong fundamentals of engineering and design. The machine uses direct-drive torque motors. A cast iron machine base provides optimum stability and dampening of cutting forces. The machine's slant bed design uses gravity to efficiently remove chips during the cutting process. Automatic X-axis (radial hob head position) retract at power failure ensures the safety of tooling during electrical loss. Total machine enclosure includes world-standard safety equipment such as electro-mechanical interlock and front splashguard doors.

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Varvel

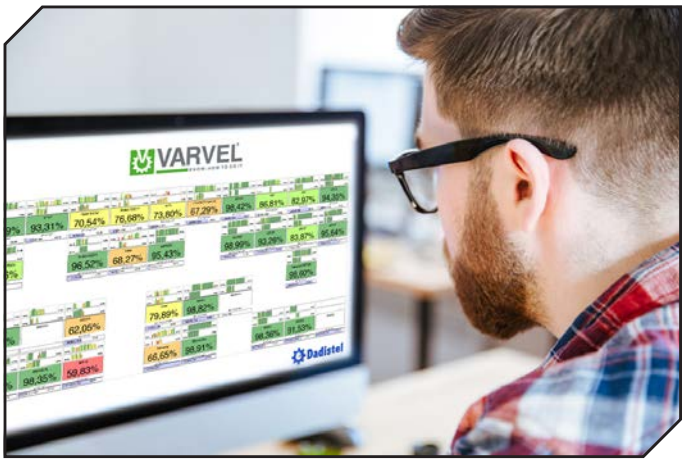
INTRODUCES NEW AUTOMATION SYSTEM

The Varvel Group has introduced Dadistel, an automation system for control of production in mechanical machining departments that enables effective and efficient time management, providing invaluable real-time information and accurate estimates on delivery times and the availability of resources, as well as an analysis of production processes and trends.

In the coming months, this extremely advanced tool will enable integrated monitoring of production flows, with a clear improvement in terms of reliability and performance. This resource enables accurate, profitable control of timings, providing information on timing related to preparation, retooling, machining, downtime/pauses, production resumption and changeover. Equally important is the counting of parts, approved and/or rejected, in addition to the indication

of average statistical times for parts produced, namely cycle, machine, loading/unloading.

These real-time calculations bring improvements in management, with benefits that affect estimates relating to delivery times and the availability of resources, favoring the entire just-in-time supply chain and producing a significant improvement in the supply chain overall. To make daily and periodical monitoring even more meticulous, Dadistel also provides analysis of production processes and trends, together with machine and loading/unloading performance details, plus essential production data.



Some product highlights:

Timings includes the information that is made available in various formulas to suit different requirements at different times: at the same time as machining; as a record of work completed; based on groupings by period and sub-period (such as shifts, days, weeks, months, quarters, years); in relation to a machine, a department or a work island and even based on references/criteria of interest.

In view of the ease and speed of installation, the Dadistel system has can be applied to all machine tools, from the oldest to the most modern, whatever brand and model they are. In addition, as it is a passive system, if offers the unique advantage of making no modifications whatsoever to existing plants.

Another feature is the fully independent data collection, which does not require operator intervention or the use of bar code readers. This means that

Dadistel guarantees objective information that cannot be manipulated, plus this information can be integrated within different perspectives, tailored to the needs of all operators — production managers, workshop managers, factory managers, owners — based on roles and requirements.

Dadistel is an artificial intelligence which, by its very nature, learns from past events and continually improves its analyses. It has already obtained a patent for the innovative combined hardware/software system on which it is based. Its introduction was facilitated by the fact that the new system integrates with the major order management and planning systems, with an interface that allows its immediate and simple use, with room for extensive customization.

For more information:
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