



What do ZOLLER and a simple gear have in common? Both are proven in use and high efficiency.

By E. ZOLLER GmbH & Co. KG

By presenting spiral face gears with an involute tooth line and an identical tooth profile in the normal section at any given radius, two applications are made possible for such face gears.

INTRODUCTION:

Gears have existed for over 2000 years and are an indispensable part of today's technology. Whether in the car, in a pinwheel, or a movement – a gear is used in many ways. In order to achieve perfect gearing, maximum efficiency, and maximum power, gears must be manufactured in a very precise manner with equally precise tools.

Today's demands on gears—such as minimal friction forces, low noise, low maintenance, durability, and minimum weight—were made with the advent of mechanical engineering and the automotive and energy industries, and they have significantly grown in importance. Consequently, higher demands are placed on accuracy, and precise manufacturing is of utmost importance. In hobbing, several teeth are always in use at the same time thereby placing great demands on the accuracy of the tools, in particular for the production of large-module gears using new cutter concepts, such as the turning plate technology.

Only perfectly manufactured and reground tools guarantee correct workpieces, short set-up times, and, less downtime of expensive gear cutting machines. Therefore, complete documentation and logging are basic requirements.



WORKSHOP-SUITED COMPLETE MEASURING OF HOBS

Today, hobs can only be measured and inspected by highly complex and very expensive measuring equipment in measuring rooms. In many cases, still profile projectors or tactile measuring

machines are used, which must be operated by specially trained personnel requiring a large amount of time. This results in high costs and bottlenecks in production.

ZOLLER combines image-processing technology with a probe and six CNC controlled axes for distortion-free complete measurement of hobs.

**ZOLLER »HOB CHECK«
- CHECK YOUR HOBS
EFFICIENTLY:**

ZOLLER measures the tooth profile directly on the cutting edge with the time-tested software function for contour measurement called "lasso" of the image processing technology "pilot." This is a significant advantage over tactile

measuring machines that measure over probe only along the surfaces of the tooth flanks and then calculate the actual cutting edge theoretically. The measuring machine »hobCheck« delivers due to the ability of pivoting the optical carrier into the cutter pitch distortion-free contours and accurate pictures of the tooth profiles. This means it meets all the

requirements for optimal measurement and inspection of high-precision hobs. It's quick and easy to use - on a machine completely suitable for workshops. With the »hobCheck«, ZOLLER delivers the first suitable system for the complete measurement of hobs that is suitable for workshop yet economical.

**WITH VARIATION,
COMPLEXITY INCREASES.**

Over time, complexity increases, which, in turn, increases quality demands in the production of gears place new demands on the tools. There are more variants of gears that require specially adapted tools. This presents increasing challenges for both tool manufacturers as well as for those who develop and deploy the metrology of these tools. Flexibility is required, and this is provided by the ZOLLER »hobCheck«.

**COMPLETE MEASURING
MACHINE:**

The »hobCheck« not only solves the challenge to measure hobs economically and with high precision, but it also includes all of the standard features of a professional measuring machine. Therefore, it is also possible to measure standard and special tools (drills, step drills, form cutters, and routers) completely. This is an added value in particular for regrinding companies.

EASY OPERATION:

In terms of technical matters and beyond, everything must run smoothly. Also, in view of remaining economical, companies must stay on the ball to be the decisive step ahead of the competitor. Process costs must be reduced with falling numbers of pieces, which in turn requires increasing flexibility and short reaction times. For the measuring technology, this means that the process must be simple and safe to use and the measurement can be taken by the machine operators.

**AS PROVEN AS THE GEAR
THE ZOLLER IMAGE:
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providing safety for both the tool manufacturer and the customer. The quality evaluation of the parameters including graphical display on the monitor and creation of a test report allows to repeat the measurement of individual parameters in tolerance overstepping. For this purpose, due to the software intelligence on the ZOLLER »hobCheck« new complete measurement is not required. The individual measurement is completely recalculated depending on the context in which it is to other metrics.

CUSTOMIZED ALSO FOR REGRINDING FACTORIES:

In addition to the complete and partial measurement of tools and their logging, ZOLLER »hobCheck« especially allows for regrinding the automatic detection of any number of teeth on the periphery or in the chest on the high-resolution incident light camera to find the tooth with the greatest wear afterwards. This greatest wear detection is entered into the grinder for repositioning of the breast

as re-measurements of individual parameters are easily implemented by anyone. Additionally, the measurement

results are automatically recorded in accordance with DIN 3968, as well as the classification according to quality

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probe and the pivotable optics carrier. Thanks to the image processing »pilot« users benefit from the variety and simplicity of the measurement of all types of tools. »hobCheck« meets all the requirements for a cost-effective complete measurement and is the perfect partner for the production of high-precision gear parts using high-precision tools. Quod erat demonstrandum (QED) - as it says at the end of each argumentation.

HOBCHECK – UNIVERSAL MEASURING MACHINE FOR FULLY AUTOMATICAL MEASUREMENT OF CYLINDRICAL HOBBS:

»hobCheck« guarantees precise and economical measurement of hobs, as well as standard and special tools. The swiveling

saving time and money due to the exact specification wear and the resulting exact regrinding data. Tools are ground in only one grinding process without any necessary corrections and are reground only as needed to avoid the unnecessary purchase of new, more expensive tools.

INDIVIDUAL ZOLLER SOLUTION FOR EVERY CUSTOMER:

For regrinding shops »hobCheck regrind« is the optimal solution for optimized application performance. Unlike for the production of hobs it does not pay to buy special equipment for complete measurement, and certainly not for hobs.


The aim here is often "only" the setting of tools such as lathe tools, measuring shaft tools and control of the regrind of hobs. The answer is »hobCheck regrind«, which does not measure hobs completely, but only the values that are important in sharpening. This reduces the cost enormously.

PROVEN IN USE AND HIGH EFFICIENCY – Q.E.D.:

Since its launch in 2011, the »hobCheck« has proven itself many times. The hardware provides a contactless micron accuracy measurement of the teeth by transmitted and incident light measurement option combined with the

optics carrier guarantees distortion-free measurement of tooth shape.

The user-friendly software with intuitive graphical user interface allows for easy installation of measuring sequences, switching from sampling to complete measurement up to the re-measurement of individual parameters directly from the result list. The calculation of the grades and the graphic recording occur automatically.

Thanks to the combination of probe, incident light camera, and transmitted light image processing, more than 15 parameters—including tooth profile, concentricity, swash, pitch, shape, and position— can be measured. 

ABOUT ZOLLER INC.:In 1945, Alfred Zoller founded the company ZOLLER in Germany, which is today in its third generation. On March 1, 1997, ZOLLER Inc. was founded in Ann Arbor, Michigan. ZOLLER Inc. is providing sales and service to its customers within the U.S., Canada and Mexico for tool presetting, tool measuring and inspection machines, tool management software, heat-shrink systems and balancing machines. For more information, please visit www.zoller-usa.com or go to www.youtube.com/zollertv.

ABOUT E. ZOLLER GMBH & CO. KG: With great enthusiasm for inspection and measuring technology, E. ZOLLER GmbH & Co. KG, based in Pleidelsheim near Stuttgart, has been developing innovative solutions for increased efficiency in manufacturing processes for more than 70 years. More than 30,000 presetting and measuring machines with internationally unrivalled software solutions have been installed to date worldwide. ZOLLER is increasingly moving from being a manufacturer of presetting and measuring machines to a globally operating provider of technology and system solutions. An international network of subsidiaries and agents guarantees maximum service quality through personal customer care.