Tool Measuring Technology
ZOLLER solutions - comprehensive optimization of your manufacturing operations to increase quality, efficiency, and productivity. To do this, ZOLLER combines measuring machines, hardware, software, and services to create individual system solutions that guarantee you a sustainable and competitive advantage.

The ZOLLER company is a worldwide expert and market leader in the field of metrology for tools and tool-based manufacturing organizations. ZOLLER has been developing innovative tool presetter and measuring machines and measuring equipment as well as software for measuring, inspection and the management of metal cutting tools for over 70 years.

In close cooperation with our customers and partners, ZOLLER has developed practice-oriented and user-friendly leading edge technology at our facilities in Germany, a commitment now in its third generation of the family-run business. Certified according to DIN EN ISO 9001:2008 and DIN EN ISO 14001:2004 for quality and environmental management, we manufacture durable quality products which excel through highest precision and maximum efficiency.

Our worldwide subsidiaries and agents guarantee customer proximity and first class service in local markets. Our declared aspiration is for products with our name to fully satisfy your requirements and make a measurable contribution to your success.

Yours, the ZOLLER family
Alexander Zoller, Christoph Zoller, Eberhard Zoller
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From Simple Measuring Tasks to Highly Complex Challenges

The Right Measuring Solution for Every Application

At ZOLLER you can find solutions ranging from simple and in-process inspection through to cost-effective and fully automated measurement of all tool parameters. With its »pom« series, ZOLLER’s proven universal measuring machines and smart automation solutions offer a broad spectrum of tool metrology ranging from entry level to superior level.

efficient
cost-effective
designed to meet your requirements

Checking
ZOLLER offers workshop-compatible and traceable compact solutions for universal tool inspection – easy to operate, adapted to your requirements, and for universal use wherever measuring and inspection tasks need to be solved.

Set-up
Tool management, easy measuring of the grinding wheel package, data transmission, and the inspection of first grinding results are all essential for the effective set-up of grinding machines. ZOLLER offers solutions with guaranteed minimization of set-up times and maximum process safety, all based on intuitive and easy operation.

Automated Quality Assurance
Automatic control, traceability, and documentation have become indispensable in the field of metrology. ZOLLER’s automation solution »robolab« sets standards for efficient quality control up to 100%.

ZOLLER INSPECTION SOLUTIONS
Inspection and Measurement Technology? ZOLLER Has the Solutions

For Perfect Reregrinding or Manufacturing Processes

Whether incoming tools inspection, manufacturing, or final inspection: ZOLLER offers the perfect solution for checking and measuring tools. For 100% perfect tools – always and everywhere.
Innovative Technology for Highest Accuracy

Precision Has a Name: ZOLLER

Every detail of the ZOLLER measuring and inspection machines offers maximum quality. Innovative technologies and superior operating comfort result in precision far greater than the mere result in micros. ZOLLER achieves this precision fully automated and process-safe, with pre-structured data, proven documentation and, if required, special solutions.

1. **Multi Sensor Technology**
   - Image processing systems with incident and transmitted light and special sensors for contactless and automatic detection of various tool contours, surfaces, cutting edge preparations, and many other tool geometries.

2. **Segmented LED Ring Light of the CCD Camera**
   - Showing products in the right perspective: tool contours are displayed in minute and brilliant detail with the special LED lighting and evaluated using »pilot 3.0« image processing.

3. **Automatic/Control (CNC)**
   - Fully automated CNC-control of the axes of the measuring machines for operator-independent full control of optional types of tools.

4. **Tool Clamping**
   - Universal high precision spindle with integrated calibration balls and power-operated tool clamping for SK, HSK, Capto, Hydrodem and many others, with rapid tool post change, changing precision 0.001 mm.

5. **Special Solutions**
   - The right solution for every challenge - ZOLLER! Even highly complex helical tools, for example hob cutters, can be measured fully automatically and precisely due to intelligent technology.

6. **Automation**
   - Fully automated checking and inspection of serial tools for 100% final inspection and documentation.

7. **Image Processing/Software**
   - Intuitive image processing for fast and micro-precise measurement results. Perfectly matched CCD cameras, lenses and automatically controlled LED lighting ensures that ZOLLER deliver brilliant cutting edge images, provide smooth inspection within seconds as well as micro-precise contours for metrology.
Clear and Intuitive Software

ZOLLER Makes Measuring Simple and Safe

The benefits of simple to operate measuring solutions are obvious: with the aid of automated solutions, tools are measured reliably and accurately at the push of a button, operator-independent, and consistently repeatable. Results are recorded in their entirety and documented in detail. The advantage: expensive errors and complaints are avoided, consistent quality is achieved resulting in cost recovery and shorter delivery times.

1. Select the type of tool from the overview

2. Select the parameters to be measured and start: no programming required

3. Measured results are displayed, the actual data is archived. Descriptions can be edited using the »apus« test report.

Check Profiles: «coCon» for Form Tools

Measuring program for scanning tool contours and calculation of contour correction using the target DWF file of eroded or ground form tools. Output of the new contour is in DWF format.

«roboSet» – the Automation Solution

Runs smoothly for 24 hours, 7 days a week – just by clicking the start button of the ZOLLER »pilot 3.0« image processing system. For more information on ZOLLER automation solutions see page 40.

Complete Evaluation According to DIN 3968 for Hob Cutters

Detailed and graphic evaluation of cylindrical hob cutters according to DIN 3968. Documentation of the concentricity/run-out of the hub diameters, deviation in shape/position of the rake face, deviation in shape of the cutting edge/tooth thickness, flute direction and many more parameters, including grading of the quality class.

100% documentation
tool-specific measuring procedures
process optimization
The Compact Solution for Universal Tool Inspection

»pomBasic«
»pomBasicMicro«

The ZOLLER inspection machines »pomBasic« and »pomBasicMicro« measure and check drills, milling cutters, and countersinks - in all sizes and down to micro tools. Compact and universal, the machines can be employed in the metrology room, tools receiving, or directly in manufacturing.

The individually adjustable »pomSoft« image processing system with intuitive operation offers numerous measuring and evaluation algorithms with automatic cutting edge search. These are used primarily for measuring angles, distances, wear and tear, cutting edge quality, and micro sections. The video microscope system with zoom optics allows for brilliant recording of the tools, adjustment of sections, and thus detailed inspection.

The universal holding fixture accepts shaft tools from 2 to 40 mm. The prism can be rotated by ± 90° for axial and radial measurement.

Fast and Easy Circumferential Measurement

Determination of chamfer width and spiral angle.

Target-Actual Comparison on Live Image

Direct comparison of the target-actual contour by superimposing saved cutting edge images with the live image of the new tool.

Test Protocols at the Push of a Button

Measurements can be documented and edited in their entirety. In addition, the language can be selected individually prior to outputting the results as PDF or printed inspection report.

Technical Specification

<table>
<thead>
<tr>
<th>Technical Specification</th>
<th>Travel Range X-Axis</th>
<th>Travel Range Y-Axis</th>
<th>Fine Adjustment Optics</th>
<th>Measurable and Clampable Shaft Diameter</th>
<th>CCD Camera</th>
<th>Field of Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>»pomBasic«</td>
<td>190 mm</td>
<td>50 mm</td>
<td>55 mm</td>
<td>0,5–50 mm</td>
<td>6,5-fold zoom lens (color)</td>
<td>3 x 2,5 mm – 20 x 16 mm</td>
</tr>
<tr>
<td>»pomBasicMicro«</td>
<td>190 mm</td>
<td>50 mm</td>
<td>55 mm</td>
<td>0,5–50 mm</td>
<td>12-fold zoom lens (b/w)</td>
<td>0,6 x 5 mm – 7 x 5,8 mm</td>
</tr>
</tbody>
</table>

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.
The Mobile Solution for Measurement of the Cutting Edge Preparation

»pomSkpGo«

The ZOLLER solution for milling tools and reversing plates scores with 100% workshop compatibility, unlimited mobility, intuitive operation, and precisely traceable results. The stiff and light basic carbon design enables a high level of accuracy as well as mobile use; the machine is set up at the place of operation and can be started after only 5 minutes.

Major advantages are: easy operation, contactless measurement, and fast alignment of tools. This allows even untrained operators to conduct highly accurate measurements by themselves within minutes. Easy to load tool holding fixtures and fast and universal positioning of the cutting edge under the high-resolution sensors with live image form the basis of perfect measuring results.

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.
The Measuring and Inspection Station for Milling Head Manufacturing

»pomZenit«

Used close to production, »pomZenit« opens a new dimension in measuring and inspection stations for manufacturing milling heads: the ergonomic measuring machine can automatically check the quality of right-angle milling heads and face milling cutters precisely without requiring an operator.

»pomZenit« convinces with automated measuring procedures, highly accurate measuring results, and ease of operation for every user. Equipped with CNC controls, a high precision spindle with autofocus and the ZOLLER »pilot 3.0« image processing system, the machine determines run-out and concentricity, measures the cutting edge angles and radii, and inspects cutting edges – including automatic remeasurement from the diagram with the tolerance range.

«pomZenit» is available as tool presetting and measuring machine for production and as bench top version for inspection stations in final inspection.

Technical Specification

<table>
<thead>
<tr>
<th></th>
<th>Travel Range</th>
<th>Max. Measurable Tool Diameter</th>
<th>Max. Tool Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>»pomZenit«</td>
<td>100 mm</td>
<td>200 mm</td>
<td>20 kg</td>
</tr>
</tbody>
</table>

The software measures all cutting edges of a tool in a rotary manner and displays the measured values of every cutting edge graphically or in table form, including the tolerance range and fast remeasurement of individual cutting edges (yellow bar) directly from the diagram.

Fully automatic single image recording of the cutting edges at incident light for checking wear.

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.
The Professional Start to the Measurement of Tools and Grinding Wheels

»smile / pilot 3.0«

The professional start to cost-effective tool measurement has a name: ZOLLER »smile«. Together with its fast, reliable, and accurate results, it offers convincing ergonomic design and simple operation which can be made even faster and more convenient by adapting the software interface to individual requirements.

»smile / pilot 3.0« meets all manufacturing requirements and remains user-friendly despite its many high performance features. Image processing is based on modular design and its numerous measuring programs make it both individual and workshop-compatible. Grinding wheels can be measured with micro precision according to the FEPA standard, by any operator and including detailed documentation.

Numerous measuring programs included

<table>
<thead>
<tr>
<th>Technical Specification</th>
<th>Travel Range Z-Axis</th>
<th>Travel Range X-Axis</th>
<th>Maximum Measurable Tool Diameter</th>
<th>Maximum Measurable Snap Gauge Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>»smile 420«</td>
<td>420 / 600* / 800** (1) mm</td>
<td>210 mm</td>
<td>420 mm</td>
<td>100 mm*</td>
</tr>
<tr>
<td>»smile 620«</td>
<td>420 / 600* / 800** (1) mm</td>
<td>310 mm</td>
<td>620 mm</td>
<td>100 mm*</td>
</tr>
</tbody>
</table>

* optional
* Measuring range Z axis 800 mm is only possible in combination with the table system.
** Snap gauge 70 mm when selecting the optic carrier standard with tool inspection.

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.

Swiveling tool inspection for axial and radial measurement.

User interface »pilot 3.0« with automatic measurement of length, diameter, corner radius, and cutting edge angle.

Simply focus – finished! Length, diameter, corner radius, cutting edge angles, and measuring range are calculated instantly. Fine adjustment is not required due to the dynamic crosshairs.

Fully automated determination of the cutting edge profile, and radius and graphic evaluation of the entire contours with tolerance range and variable setting of the angle sectors.

Angle and Radius Measurement

Automatic Recognition of Cutting Edge Shape and Dynamic Crosshairs

Radius Contour »contur«

Measurement of Grinding Wheels

Photo-realistic input dialog including documentation and reports. Library of grinding wheels according to FEPA standard.
The Universal Measuring Machine for Tool Inspection

»smartCheck«

»smartCheck« is the high-performance universal measuring machine for all metal cutting tools – either as manual or 3-axis CNC version: this provides the ability to cost effectively check and document tools prior to and after grinding in accordance with the DIN EN ISO 9000 guidelines.

The »smartCheck« and swiveling incident light processing allows cost effective checking, measuring, and documenting of axial and radial geometries of tools. Simply click the mouse – no special training required. The measurement of tools prior to regrinding can result in a 25% increase in productivity or potentially greater with CNC grinding machines.

Concentricity Check 360°/Wobble Compensation

For the automatic determination of tool contours, radii, angles, distances, chamfer widths as well as wear, and other parameters with incident and transmitted light.

»apus« Test Reports

Editable test report for arbitrary and savable adaptation of the scope and descriptions.

Technical Specification

<table>
<thead>
<tr>
<th>Tool Analysis »metis«/Circumferential Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Analysis »lasso«/Target-Actual Comparison</td>
</tr>
<tr>
<td>Concentricity Check 360°/Wobble Compensation</td>
</tr>
<tr>
<td>»apus« Test Reports</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tool check with maximum cost-efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Specification</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>»smartCheck 450«</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>»smartCheck 600«</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>»smartCheck 800«</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

* optional

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.
The Universal Measuring Machine for Precision Tools

»genius 3s«
»genius 3m«

ZOLLER »genius 3s« is the universal measuring machine for metal cutting tools. The »genius 3m« version can also be used for micro-geometries. Five CNC-guided axes enable extensive, precise, and fully automated measuring procedures.

Tools are checked quickly, easily, and with the highest precision, starting with individual criteria through fully automated and operator independent complete checks. The measured results are documented in detail and can be transferred to the grinding machines at the push of a button. Thus »genius 3s« saves valuable time during work preparation and programming, excludes reworking, and complaints and provides excellence in quality.

»genius 3s« with full housing to protect against dirt and extraneous light.

For measuring the chip space (see above), the circumference, and the face of tools. The measuring procedures and parameters can be freely defined, selected via the checkbox, and saved for the tool.

Regardless of the incident light measurement used, the configuration assistant carries out the measuring window sizes, lighting optimization and positions, live and once only, and then automatically stores the data.

This function allows data in the ZOLLER »pilot 3.0« to be imported and exported in XML file format at the push of a button.

The contactless and automatically scanned tool surfaces can be displayed to give three-dimensional information on the calculation of the effective cutting angles or draft angles.

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Technical Specification

<table>
<thead>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>»genius 3s«</td>
<td>600 mm</td>
<td>175 mm</td>
<td>+ 50 mm</td>
<td>340 mm</td>
<td>≤70 mm</td>
<td>Ø ≤ 200 mm</td>
<td>Ø ≤ 200 mm</td>
<td>Ø ≤ 75 mm</td>
<td>Z ≤ 470 mm</td>
</tr>
<tr>
<td>»genius 3m«</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8 ≤ 230 mm</td>
</tr>
</tbody>
</table>

* When selecting the optic carrier with micro incident light camera

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.
The Universal Measuring Machine Specifically for Threaded Tools

»threadCheck«

»threadCheck« is the ZOLLER measuring machine for the distortion-free and accurate measurement of threaded tools.

Six CNC-driven axes and the fully automatic swiveling optical carrier enable complex measurement of thread geometries, threaded drills, milling cutters and formers as well as numerous other metal cutting tools. The full housing protects against dirt and extraneous light. All measured results are recorded in detail and the photo-realistic and modular selection of »pilot 3.0« measuring programs enable »threadCheck« to meet a host of requirements.

»threadCheck« can also be used as a universal measuring machine for metal cutting tools in general.

Measuring Program for Threading Tools

For operator-independent and automatic measurement of threaded tools.

Actual-Target Contour Comparison »lasso«

Determination of contour profile and transfer of target contour in »lasso« for thread formers.

Evaluation of Results Including Test Report

Complete documentation of measurements through automatic evaluation and output as PDF or printed test report.

Technical Specification

<table>
<thead>
<tr>
<th>Measurable Tool Diameter</th>
<th>Measurable Snap Gauge Diameter</th>
<th>Swiveling Device for Optical Carrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>± 50 mm</td>
<td>± 30°</td>
<td></td>
</tr>
</tbody>
</table>

Options

- Measuring sensor for tactile measurement, for example, pitch or form/position tolerance of hobbing machines.
- Swiveling optical carrier for distortion-free measurement and checking of helical tools with transmitted light.
- Micro sensor for measuring micro-geometries, i.e. protective and supporting chamfers.

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.
The High-End Inspection and Measuring Machine for All Precision Tools

»titan«

In the world of tool metrology, the new ZOLLER universal »titan« machine is unsurpassed in its flexibility and precision.

The ergonomic and easy operation of a measuring machine of these dimensions offers an unbeatable advantage in terms of cost-efficiency and quality in the micro-precise measurement of metal cutting tools. The five to seven CNC-driven axes of the ZOLLER »titan« measure every type of metal cutting tool fully automatically and with the highest precision, ranging from measuring the outer contours, operator-independent complete control through extensive documentation. The vibration-reduced base is designed to fit further axes and sensors so that, for example, cutting edge preparations can be measured fully automatically and with unique repeatability.

Technical Specification

<table>
<thead>
<tr>
<th></th>
<th>Travel Range</th>
<th>Travel Range</th>
<th>Travel Range</th>
<th>Measurable Tool Diameter</th>
<th>Measurable Snap Gauge Diameter</th>
<th>Max. Tool Length for Axial Incidental Light Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>»titan«</td>
<td>600 mm</td>
<td>130/75* mm</td>
<td>+ 100 mm</td>
<td>260/150* mm</td>
<td>60 mm</td>
<td>400 mm</td>
</tr>
</tbody>
</table>

* Optional with optical carrier CNC swiveling device
Subject to technical modifications. The depicted machines may include options, accessories, and control variants.
The Solution for the Fully Automated Measurement of Cylindrical Hobbing Machines

»hobCheck«

The »hobCheck« opens up unprecedented opportunities for fully automated, cost-effective, and complete measurement of hobbing machines – and much more!

Equipped with a CNC-driven swiveling optical carrier, electronic measuring sensor, transmitted light processing, and incident light camera, it can measure parameters such as tooth profiles, concentricity/wobble, pitch etc. Over 200 measured values can be evaluated and the calculation of the quality grades and graphic documentation is fully automatic. Additionally, the »hobCheck« offers convenient wear determination.

<table>
<thead>
<tr>
<th>Technical Specification</th>
<th>Travel Range Z-Axis</th>
<th>Travel Range X-Axis</th>
<th>Travel Range Y-Axis</th>
<th>Measurable Tool Diameter</th>
<th>Measurable Snap Gauge Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>»hobCheck«</td>
<td>600 / 800 / 1000* mm</td>
<td>200 mm</td>
<td>± 40 mm</td>
<td>400 mm</td>
<td>60 mm</td>
</tr>
</tbody>
</table>

* optional

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.

Target-Actual Comparison Tooth Profile

Evaluation of tooth form via variable measuring windows at the flanks, including automatic target-actual comparison.

Measuring Program »Protuberanz« for Hob Cutters

For the measurement of cylindrical hob cutters including calculation of the amount, height, and angle of protuberance.

Wear Inspection »aec« (auto-edge-check)

The »aec« function automatically records the circumferences of an optional number of teeth and thus provides a quick overview for finding and targeted checking of major wear to ensure that neither too little or too much is removed during resharpening.

Display of Results According to DIN 3968

Graphic display of the measured results according to DIN 3968 with tolerance check and information on the quality grade achieved per parameter.

Test Reports Including Tolerance Graphs

Exact and complete documentation, competent and clear.

Fully automatic measurement of hobbing machines
ZOLLER »sawCheck« optimizes the precise and cost-efficient manufacturing and regrinding of precision saws. The saw blades are checked fast, reliably and precisely, and are extensively documented – regardless of the clamping.

The saw blades are clamped via universal reducers and the run-out for the saw body is documented automatically. Subsequently, it is compensated when measuring the teeth. The manually operated –90°/0°/+90° incident light image processing system is available for tooth inspection (radial/axial).

The universal clamping system of the »sawCheck« provides optimal, distortion-free clamping and measurement through horizontal holding of the saws.

Technical Specification

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Travel Range Z-Axis</th>
<th>Travel Range X-Axis</th>
<th>Measurable Tool Diameter</th>
<th>Incident Light Camera Diameter</th>
<th>Width of Saw Blade</th>
</tr>
</thead>
<tbody>
<tr>
<td>»sawCheck«</td>
<td>100 mm</td>
<td>300 mm</td>
<td>300-800 mm</td>
<td>200 mm</td>
<td>1.5–8 mm</td>
</tr>
</tbody>
</table>

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.
The Automation Solution for Companies with High Tool Throughput Levels

»roboSet«

»roboSet« loads your ZOLLER measuring machine 24/7. Complex measuring tasks can be processed fully automatically with 100% checking guaranteed.

»roboSet« can load virtually any CNC-driven ZOLLER measuring machine equipped with automatic power-operated clamping and »pilot 3.0« with shaft tools. It is easy to operate – simply push the start button to start the automatic operation.

ZOLLER »roboSet« offers a high level of process safety due to the automatic path correction of the robot during every single feeding procedure. In addition, mechanical disconnection from the measuring device assures the highest standards of measuring accuracy.

Technical Specification

<table>
<thead>
<tr>
<th>Technical Specification</th>
<th>Range</th>
<th>Positioning Accuracy</th>
<th>Maximum Load</th>
<th>Working Area</th>
<th>Number of Pallets</th>
</tr>
</thead>
<tbody>
<tr>
<td>»roboSet«</td>
<td>900 mm</td>
<td>±0.03 mm</td>
<td>5 kg without gripper</td>
<td>1050 x 350 mm</td>
<td>3 pieces</td>
</tr>
</tbody>
</table>

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.

Online status display: status on view for 24 hours.

Fit for every requirement with »pilot 3.0« – fast and simple. Ideal for fully automatic CNC-driven measuring machines with »roboSet«.

<table>
<thead>
<tr>
<th>1. Universal Automation Solution »roboSet / genius«</th>
<th>Automation solution for automatic measurement of optional parameters with the universal »genius 3« measuring machine.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. »roboSet / threadCheck«</td>
<td>100% check, even with helical threaded tools.</td>
</tr>
<tr>
<td>3. »roboSet / threadCheck«</td>
<td>Automatic Solution for Tool Labeling »roboMark«</td>
</tr>
<tr>
<td>4. »roboSet / threadCheck«</td>
<td>Operator-defined labeling options directly after measuring.</td>
</tr>
<tr>
<td>5. »roboSet / threadCheck«</td>
<td>Unit for fully automatic cleaning of shaft tools prior to measuring.</td>
</tr>
<tr>
<td>6. »roboSet / threadCheck«</td>
<td>Automatic Assignment of Pallets</td>
</tr>
<tr>
<td>7. »roboSet / threadCheck«</td>
<td>Automatic target-actual comparison of tools through input of tolerances into »pilot 3.0« pallet management including sorting.</td>
</tr>
</tbody>
</table>

Fully automatic, enduring, accurate.
The 24/7 Automation Solution for High Tool Throughput

»roboSet 2«

»roboSet 2« is available in combination with closed ZOLLER universal measuring machines »titan«, »threadCheck«, and »genius«.

Ideal for tool manufacturers with very high tool throughput who need 100% monitoring and logging. Networked directly with your ZOLLER universal measuring machine, »roboSet 2« can load tools around the clock, 7 days a week, completely autonomously. Thanks to a multi-pallet system and double gripper, it can process and document large numbers of tools fully automatically. The machine also guarantees maximum process security and measurement accuracy through automatic path correction during feeding, and a loading system which is mechanically decoupled from the measuring machine.

Technical Specification

<table>
<thead>
<tr>
<th>Technical Specification</th>
<th>Range</th>
<th>Positioning Accuracy</th>
<th>Maximum Load</th>
<th>Working Area</th>
<th>Number of Pallets</th>
</tr>
</thead>
<tbody>
<tr>
<td>»roboSet 2«</td>
<td>920 mm</td>
<td>±0,05 mm</td>
<td>7 kg without gripper</td>
<td>1050 x 350 mm</td>
<td>8 pieces</td>
</tr>
</tbody>
</table>

Subject to technical modifications. The depicted machines may include options, accessories, and control variants.
For Smooth Production Processes

Process Optimization with ZOLLER

Growing demands are being placed on grinding and sharpening businesses as well as tool manufacturers. 100% checking, traceability, and process safety are increasingly becoming standard. The following pages demonstrate how these changes can easily be managed with ZOLLER:

The ZOLLER interfaces are the basis for smooth operations and offer you entirely new savings potentials: the grinding program simultaneously creates the data set for the measuring machine from which the fully automatic ZOLLER measuring procedure is generated. Depending on the interface, the measured data are sent to the programming system or the grinding machine and the grinding program is corrected temporarily. This way the programming requirements and machine downtimes are reduced to a minimum. You save time and costs — and also avoid errors in data entry and in generating a new grinding program.

GDX Interface

- Open data interface for the construction and manufacturing of cutting tools
- Transfer of the tool definition to the ZOLLER measuring machine in GDX format
- Acquisition of real tool contour and all parameters to be measured
- Retransfer of the data in GDX format
- Transfer of the grinding wheel data from the measuring machine to the grinding machine

Whether »genius«, »smartCheck« or »smile«: all ZOLLER machines can transmit the tool target/actual data paperless (depending on the scope of performance/measurement).

ZOLLER offers the matching interfaces for virtually all systems involved in the grinding process, like GDX 2.0, NUMROTO, Anca, MTS, and many more.

Automatic generation of measuring procedure for measuring and inspecting tools from grinding programs
- Fully automatic contour correction for form tools »CoCon«
- Fully automatic measurement and data transfer of the grinding wheel sets
- Marginal programming requirements for regrinding of metal cutting tools
- Complete documentation with automatically generated and saved test reports
New Tools

Processing of Nominal Data Which Has Been Programmed with NUM, MTS, Anca, Schütte etc.

The NC program for tool grinding is transferred to the NC grinding machine. At the same time the programming system sends a measurement data file to the «genius» from which ZOLLER generates a fully automated measuring procedure.

Form Tools

Recording a Complex Form Tool for Production or Correction

The contours of the form tool are scanned automatically with the «genius» and recorded as complete contour profile with thousands of coordinate points. Only the start and end points of the measuring task are adopted via playback input.

The first ground tool is scanned automatically by the «genius» together with a predefined test plan and the measured results are printed out as a test report.
Determining Measuring Tasks Directly with the 3D Model of the Tool

»caz« for Tool Manufacturers

Measuring Program for Precise Recording of Individual Parameters for Grinding Wheels

1. Programming and Analysis
2. Analysis and Generation of Measuring Procedure
3. Tool Production
4. Selection of Types of Grinding Wheels
5. Tool Production
6. Measuring Procedure
7. SHIPMENT of Tools and Tool Measurement
8. Check Incl. Test Report
9. Different types of grinding wheels can be selected on the ZOLLER »smile«, compiled as a package and saved.

Adopting the finished tool and measuring according to the measuring procedure as described under point 2 with tolerance check on »genius«.

After measuring and correcting tolerance check on the »genius« the tool is ready for shipment.

Different types of grinding wheels can be selected on the ZOLLER »smile«, compiled as a package and saved.

Output of the measured data via the network to the CNC machine, programming system for manufacturing or simulation. A printout of the measured values can be added at any time as accompanying documentation.

Tools are developed with CAD software and the 3D model transferred to »caz«. Prior to fabricating a prototype, the tool is analyzed in an FEM application using the 3D model. The data is then transferred to the ZOLLER data base.

The tool designer, who knows the relevant details of the tool, generates and simulates the measuring procedure in »caz« using the 3D model. The data is then transferred to the ZOLLER data base.

Milling or grinding of the tool on the CNC machine is performed according to the 3D model or NC program.

After entering and confirming the values in the input dialog, the measuring run can be started. The X and Z target positions are positioned automatically and measured.

Output of the measured data via the network to the CNC machine, programming system for manufacturing or simulation. A printout of the measured values can be added at any time as accompanying documentation.

Various types of grinding wheels in measuring program 410 according to FEPA standard.

Generating the measuring procedure with the 3D model

Transfer to »pilot 3.0« data base

«caz» virtual measuring system

CNC grinding machine/s

Tool production

Tool measurement

Tool passed to »genius«

CAD module

SINGLE data base

«caz» and »genius«

Test report

ZOLLER »genius« | Automatic measurement of tools

ZOLLER »smile / pilot 3.0«

Selection of grinding wheels on the measuring machine

Measurement of grinding wheels

CNC grinding machine/s

Various types of grinding wheels in measuring program 410 according to FEPA standard.

Grinding wheel packages

Selection of grinding wheels

Measurement of grinding wheels

CNC grinding machine/s

Various types of grinding wheels in measuring program 410 according to FEPA standard.
ZOLLER measuring technology is your quality guarantee for precision in manufacturing. The measuring uncertainty of the ZOLLER inspection and measuring machines is verified with certified test mandrels, angle, step, and radius gauges, image processing is calibrated accurately, and the suitability of the measuring machine is established 100%. The result is a traceable and documented precision which meets the product-specific requirements of metrology. This guarantees our customers permanent traceable measuring reliability.

1. Angle Gauge
   For checking angle measurement precision of the measuring machine, for draft angles and effective cutting angles.

2. FKM Gauge
   Calibration gauge made of fiber ceramics for calibration of absolute accuracy and determining the measuring uncertainty $E = (3 + L/250)$ mm $\mu$m.

3. Step Gauge
   For verification and checking of diametrical precision.

4. Calibration Gauge »pilot 3.0«
   For calibration of the image processing system »pilot 3.0« with transmitted and incident light.

5. Radius Gauges
   For checking measuring precision at all the radii.

6. Test Mandrels
   For verification of parallelism and concentricity with high-precision interfaces for ZOLLER universal spindles.
Satisfied Customers Speak for Themselves – and for ZOLLER

Success Is the Best Reference

AIRBUS
ALSTOM
ALCATEL
ANCA
ANTON HÄRING
AUDI
BAR MAG
BMW
BOEING
BOERBOOM SONDERWERKZEUGE
BOMBARDEIR TRANSPORTATION
BOSCH
BRAUN
BRITISH AERIAL SPACE
CATER PILLAR
CHRION
CONMBACO
CONSOLIDATED DIESEL
CONTINENTAL TEVES
DAF
DAIMLER
DAEWOO
DANFOSS
DASSAULT
DEMAG-DMS
DIE & S
EMAG
ENGEL
EUROCOPTER DEUTSCHLAND
FERRARI
FICHTEL & SACHS
FLENDER
FORD
FRANSA
GENERAL ELECTRIC
GENERAL MOTORS
GENEX
GO TOOL
GP SYSTEM
GRÖHE
GRUNDfos
GÜHRING
HAERING
HAMESO
HANA TOOLS
HAUN
HAYES LEMMEER
HEIDELBERGER DRUCK
HELLER
HOFER
HUSCHMIED
HYUNDAI
IHYA MAKINA
IKI LEASING
INA
ISCAR
ISOG
IVECO
JOHN DEERE
K2 MEDICAL
KARAT-PRÄZISIONSWERKZEUGE
KARCAN KESIC TAKIM
KAVO
KENNAMETAL
KNORR-BREMSE
KOMET
KONSIEBERG
KRONES
LASCO
LEITZ
LEUCO
LIEBHERR
Linde
LUCAS GIRLING
LUK
MAHLE
MAN B & W DIESEL
MANNESMANN
MAZAK
METABO
METALDYNE
MORI SEIKI
MTU
NACHREINER
NEUBER INDUSTRIAL DIAMOND
NEW HOLLAND
NIPPO AB
NISSAN
NOMOS SLASHÜTTE
PEUGEOT
PIERBURG
PORSCHE
PRATT & WHITNEY
PSA [FRANCE]
REIS
RENault
RINGE & SCHWARZ
RILLS ROYCE
SAAB SCANA
SAICKE
SAMSUNG
SANDvik
SCHÜTTE
SECO
SIEMENS
SMITH & NIEPHE
STARRAGHECKER
STOKK-WÄRTSILÄ
SULZER
TAEGUTEC
TOYOTA
TRUMPF
VOITH
VOLKSWAGEN
VOLLMER
VOLO
WEBB WHEEL
ZF FREIDRICHSHAFEN
ZUMTobel
YG-1
AND MANY MORE.

Christel and Ralph Hufschmied, Hufschmied Zerspanungssysteme GmbH

“...in the field of metrology there is an increasing demand for 100% documentation and traceability. Therefore we need to automate more and more. We operate ZOLLER »roboSet« in combination with »genius« in 3 shifts, they run day and night and give us time savings of approximately 30%.”

Jean Madern, Managing Director Madern International B.V., Netherlands

“The ZOLLER »genius« can really measure all the relevant parameters of the milling tools: this applies both to the cutting edges at the circumference and the helix, as well as effective cutting angles and draft angles, face geometries and the diameters at any point for tapered tools. By using this universal measuring machine we can now better understand the wear process and improve our knowledge in the field of grinding technology decisively.”

Frank Höhnel, Project Manager Nomos Glashütte, Glashütte

“We place the highest demands on measuring and inspection. Our experience with ZOLLER has been good.”

“All we need to do is to place the tool into the »pomBasic«, position it, measure it – and finished. It is so simple: automatic finding of the cutting edges for high accuracy, it is like an assisted measuring process. And we get the test reports at the click of a mouse.”

Paul Larco, sales employee and operator, Neuber Industrial Diamond Company, Burlington, MA, USA
Supplying quality at ZOLLER also means being there for you after the sale. With personal advice and with high quality maintenance models for your ZOLLER tool presetter and measuring machines, the ZOLLER Service Team with its specially ZOLLER-trained technicians is always at your call. For low downtimes and first class service.

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**ZOLLER Service, an Overview:**

ZOLLER offers you unique support and services - worldwide. This starts with preventive maintenance for a long service life, precision, and reliability. And is complemented by quality certifications, calibration services, and targeted training measures to ensure that your measuring machines and software are always in tip condition. Extremely well trained and equipped ZOLLER service employees are available to install and service the measuring machines.

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**BUSINESS SOLUTIONS – from A–Z**

- Training and courses on numerous application fields
- Full service maintenance in contract
- ISO 9001 check with calibration certificate
- Measuring machine capacities test
- Machine calibrations
- Proof of accident prevention regulations
- Software updates and hardware upgrades
- Installation and adapting of mechanical, optical, and electronic components

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**The competent ZOLLER hotline offers you support in all questions pertaining to applications and services. A call is all it takes.**

**Service**

**Telephone** +49 7144 8970-0
Economical Solutions for All Applications

Unless stated otherwise, the tool presetter and measuring machines as well as the measuring and inspection devices are equipped with ZOLLER »pilot 3.0« image processing. The »pom« series is equipped with ZOLLER »pomSoft« image processing.

**BRONZE**
- **powerShrink**
  Inductive manual shrinking machine for HSS and hard metal tools
- **reamCheck**
  The measuring machine for the tactile measurement of finely adjustable cutting inserts, especially reamers
- **aralon**
  The CNC-driven measuring instrument for crankshaft cutters with internal tool cutting edges
- **gemini 2**
  Special presetter and measuring machine for crankshaft cutters
- **tribos**
  The presetting, measuring and shrinking machine with TRIBOS clamping system
- **redomatic**
  The universal presetting, measuring and heat-shrink machine
- **hyperion 500/700**
  Horizontal tool presetting and measuring machine series specifically for turned production with extended measuring range in the Z-axis
- **smile / pilot 1.0**
  Vertical tool presetter and measuring machine for contract manufacturing
- **smile / pilot 2 mT**
  Vertical tool presetter and measuring machine with innovative Touch-Screen operating technology
- **smile / pilot 3.0**
  Vertical tool presetter and measuring machine for a professional start
- **smileCompact**
  The mini-must-have for professional tool presetting and measuring
- **hyperion 300**
  Horizontal tool presetting and measuring machine series specifically for turned production
- **pomZenit** mit »pilot 3.0«
  Measuring and inspection station for milling head manufacturing directly next to the machine
- **millCheck**
  CNC presetter and measuring machine for milling heads and cap milling machines
- **toolBalancer**
  Modular balancing system for maximum accuracy
- **millSet**
  Presetter station for face milling cutters at the machine directly in manufacturing
- **venturion 600/800**
  Tool presetting and measuring machine series of modular premium class with extended measuring range
- **venturion 450**
  The premium presetting and measuring machine for tools of all kinds
- **roboset / venturion**
  Smart automation solution for 100% tool check
- **roboset 2 / genius**
  24/7 automation solution for tool manufacturers with very high tool throughput
- **roboset / genius 3**
  Smart automation solution for the comprehensive inspection of all metal cutting tools
- **pomBasic**
  Inspection machines for process-oriented measurement and inspection of drills, milling cutters and countersinks, design also for micro-geometries
- **pomBasicMicro**
- **pomZenit**
  Measuring and inspection station for milling head manufacturing directly next to the machine
- **pomSkpGo**
  Mobile solution for the measurement of the cutting edge preparation
- **smartCheck**
  The high performance universal measuring machine for tool inspection
- **threadCheck**
  Universal measuring machine for complete measurement of helical tools
- **hobCheck**
  Universal measuring machine for complete measurement of hob cutters
- **titan**
  The high-end universal measuring machine for fully automated complete tool measurement
- **sawCheck**
  Measurement and inspection device for the fully automated, micro-precision measurement of metal saw blades
- **genius 3s**
  The universal measuring machine for precision tools
- **genius 3m**

**SILVER**
- Software package for efficient stock management and standardized data management for production

**GOLD**
- Software package for a transparent process chain and solid cost control

**ZOLLER Data base**
- Tool Management
- Tool measuring technology
- Automation solutions
ZOLLER solutions – comprehensive optimization of your manufacturing operations. ZOLLER combines hardware, software and services to individual system solutions to improve quality, efficiency and productivity. Customers of ZOLLER will benefit from our knowledge as a market leader in the field of tool measurement technology. As a family-run business, ZOLLER guarantees to provide a sustainable and competitive advantage thereby making a measurable contribution to your success.

www.zoller.info

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