

Universal measuring machine for cutting tools
genius 3/pilot 3.0



The universal measuring machine
»genius 3«

There are various measuring machines for metal cutting tools, but only one ZOLLER »genius 3«.

This unique universal measuring machine gives you an excellent return on investment as it saves you valuable time during work preparation and programming by preventing troublesome rework and customer complaints. On top of that,

it ensures quality results that convince both you and your customers. See for yourself – you will be inspired.

ZOLLER »genius 3« is the universal measuring machine for metal cutting tools. From rapid testing of individual criteria to complete, fully automatic, operator-independent checks your tools are checked quickly, simply and extremely precisely. The measurement results are documented in detail and can be transferred to the grinding machines at the push of a button. Find out how simply it all happens, as well as the other benefits »genius 3« can give you in the following pages.



Traversing ranges					
	Z-axis length	X-axis length	Y-axis length	Diameter	Snap gauge Ø
»genius 3«	600 mm	175 mm	100 mm	340 mm	100 mm



The ZOLLER »genius 3« Highlights

- Compact structure and low space requirement
- Total encasement to prevent dust and extraneous light
- Dimensionally stable design elements and high-tech materials for high stability and optimum suitability for use under production conditions, even without a climate-controlled room
- »pilot 3.0« electronics and software
- 5-axis CNC control unit and manual axis adjustment for quick spot checks
- Fully automatic measuring cycle
- 17" TFT color display with touch-screen operation
- Brand-name products such as Bosch pneumatics, Heidenhain measuring systems, THK guide systems and many others
- Sony cameras with telecentric lenses
- LED incident light, automatically adjustable in 8 segments
- Adjustable control center for ergonomic layout as a standing or desk workstation
- »A.C.E.« universal spindle with power clamping
- Automatic hydraulic expansion for tools
- Intelligent calibration and automatic search runs
- CNC-controlled, ability to pivot and backlash-free indexed camera for radial and axial measurements between 0° and 90°
- Interactive configuration wizard for easy operation
- Extremely fast measuring speed
- Virtual joystick and membrane keyboard
- software modules customized
- »elephant« technology

Measure, test and save money
with the »genius 3«!

Innovative technology and ergonomic operation

Speed and comfort during the testing and measuring process translates into pure profit every day in the form of a considerable increase in productivity and motivated, efficient employees. ZOLLER strives to make machine operation as simple and ergonomic as possible and to create the optimum basis for a fully automatic measuring cycle.

Storage shelf



Space-saving and easily accessible trays for accessories such as changeable sleeves, adapters and tool posts.

ZOLLER »Cockpit«



Adjustable control center for ergonomic layout as a standing or desk workstation.



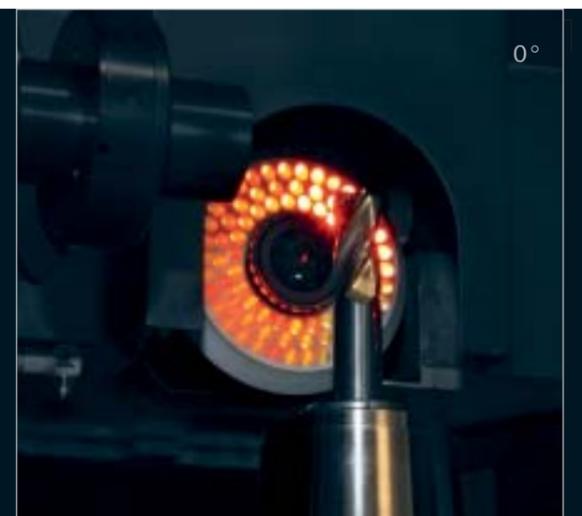
CNC-driven, adjustable 3D CCD camera and LED lighting



Axial, backlash-free positioning for automatic measurement of the end contour of tools.



CNC-driven pivot position as required for measuring transition radii and slopes, for example of the edge honing.



Radial, backlash-free positioning for automatically measuring the tools at circumference and in the chip space.

Universal tool holding fixture

Rapid changing guaranteed

ZOLLER tool posts are as quick, convenient and reliable to change as tools – and just as accurate. The beautifully simple principle of modular construction has convinced users all over the world since 1968. The icing on the cake: The spindle is fitted with a ball bushing into which all ZOLLER tool posts can be inserted with absolute precision and above all without play. For you, this means: Changing tool posts in less than 10 seconds with an accuracy of 0.001 mm. Other convincing features of the tried and tested system are its small number of components, low weight and its absolute freedom from wear. That makes the ZOLLER change system the first choice not only technically but economically too.

ZOLLER measures everything – and clamps everything, whether steep or hollow shank taper, Sandvik-Capto or Kennametal. From the smallest to the largest shank, from diameters of 3 to 32 mm. The comprehensive ZOLLER system measures any type of tool and is flexibly adaptable to the most recent developments in the market, even in the future. So the matching tool posts are always available, regardless of which tools you have to measure now or in the future. At the same time, all the tool shanks are power-operated at the push of a button and thus always clamped with the same power and with repeatable accuracy.

Tool posts for »A.C.E.« spindles | Available for all tools used in the world



- 1 SK40 tool chuck
- 2 Steep taper tool post (SK)
- 3 Grinding wheel package
- 4 Monoblock tool
- 5 Hollow shank taper tool post (HSK)
- 6 Capto multi tool
- 7 Capto milling cutter holding fixture
- 8 Sandvik-Capto tool post
- 9 KM turning holder
- 10 Kennametal tool post
- 11 Insert holder, D32 mm
- 12 Baby chuck clamping tool seat, D32 mm
- 13 Plane table for small parts, D32 mm
- 14 Hydraulic expansion tool post, D32 mm
- 15 Glass plate for inserts, D32 mm
- 16 Changeable sleeve, D32 mm
- 17 Stepped drill
- 18 Form cutter



ZOLLER »A.C.E.« spindles

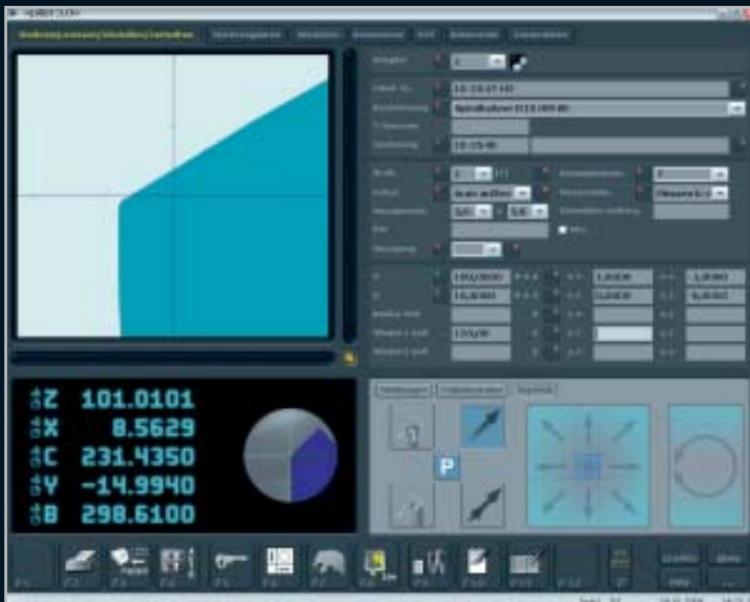
Fast, universal and accurate:

The high-precision spindle »A.C.E.« clamps any tool in a power-operated manner, whether steep taper, hollow shank taper, Sandvik Capto, Kennametal or cylindrical shanks. With changing accuracy to the micrometer and only 10 seconds per tool post.



ZOLLER »pilot 3.0« electronics Software for all requirements

For the highest performance and best quality, hardware and software assume equal responsibility. And that's what makes the combination of ZOLLER »genius 3« with »pilot 3.0« electronics so unbeatable: they are perfectly matched to each other to provide the user with exactly what he or she is looking for: real labor savings.



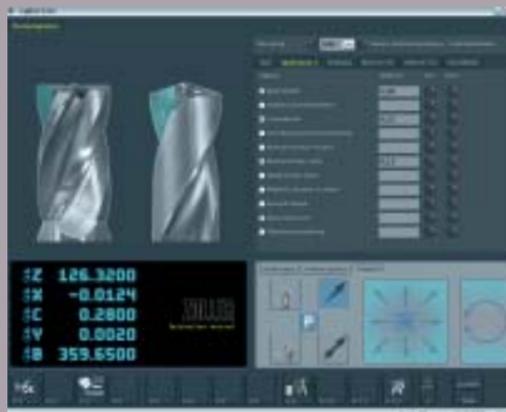
ZOLLER »pilot 3.0« software highlights:

- »elephant« technology, measure ground tools – automatically, without programming time
- »expert« measuring program generator – measure tools in transmitted and incident light, in the chip space, at circumference and at the end
- Measurement of contours, radii, angles, distances, wear, chamfer width, and many more.
- Fully automatic edge determination
- Determine profiles in incident light in any desired manner
- Image archiving and software zoom
- Define and create automatic measuring sequences flexibly
- Concentricity and wobble compensation
- Scan any desired rotationally symmetrical tool or work piece contour with »lasso« contour measuring
- Scanning of chip space contour with graphical display – automatically and without contact
- Nominal/actual comparison to DXF nominal contour with variable tolerance band
- Automatic generation of tool drawing from the actual data of the tool
- Measurement of cutting edge preparation (edge rounding)
- Save and print functions
- Interfaces to grinding machine controls
- And many more



ZOLLER measuring program generator »expert«

Fully automatic measuring cycle at the click of a mouse: Just set the desired measurement position manually or by CNC, check the boxes of the parameters to be measured – done! All geometries which can be measured with »genius 3« are ordered under the headings "chip space", "circumference" or "end" and displayed graphically. Standard parameters are stored for each measurement operation and can be adapted as required. The measuring sequence determined for the tool is saved and is available at any time for subsequent measurements. Saved measurement programs can be edited and expanded. Simply select and deselect new parameters or measure individual parameters repeatedly in a targeted manner.



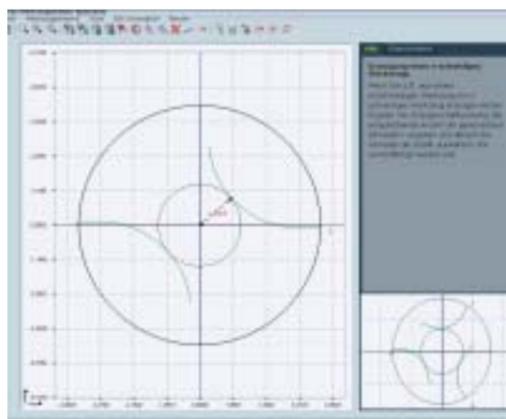
Chip space select menu:
Example: effective cutting angle



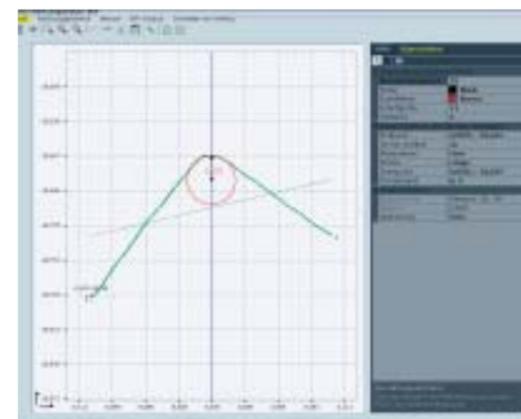
Select menu for measuring at circumference:
Example: head length

ZOLLER electronics Highlights

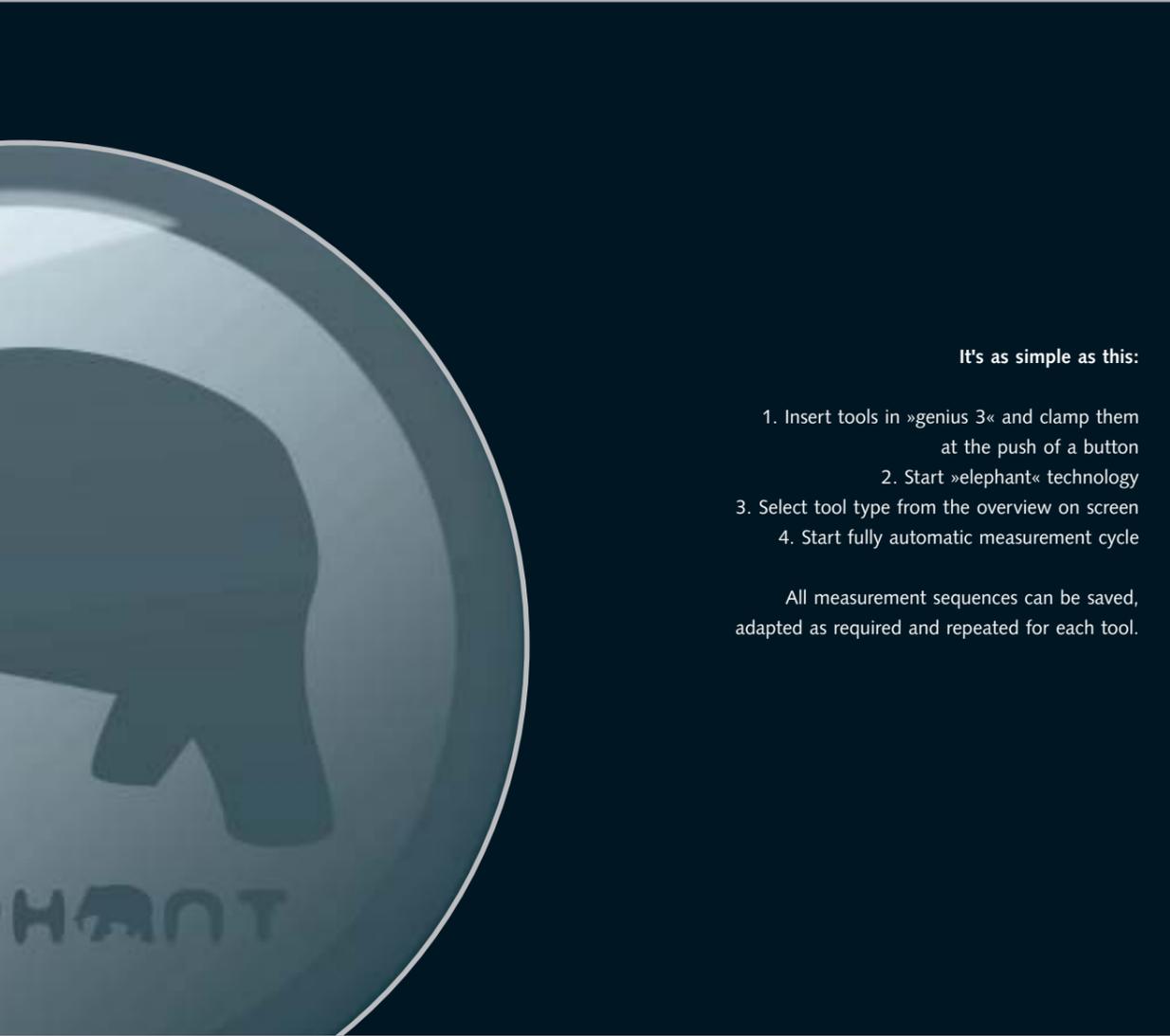
How good a machine control system is can be seen in its application. When it's not a matter of theory, but of practice, of day-to-day work, in which user-friendliness, time saving and precise results are indispensable. This is where ZOLLER electronics show their strengths: because they have features which make work easier for the user. A small selection of examples can be found below – but that's not all, not by a long way. We would be glad to show you personally how you can solve your specific problems quickly and simply. Just call us.



The groove/chip space contour is scanned automatically, without contact, and displayed graphically. It can be exported as a DXF/XML file and subjected to a nominal/actual comparison.



The edge honing is measured without contact and displayed in section for assessing the angles and radii.



ZOLLER »elephant«
Extremely easy to operate

This unique technology is now also available for »genius 3«.
With this software, any employee can measure up to 52 different parameters of any standard tool fully automatically without any training time.

It's as simple as this:

1. Insert tools in »genius 3« and clamp them at the push of a button
2. Start »elephant« technology
3. Select tool type from the overview on screen
4. Start fully automatic measurement cycle

All measurement sequences can be saved, adapted as required and repeated for each tool.



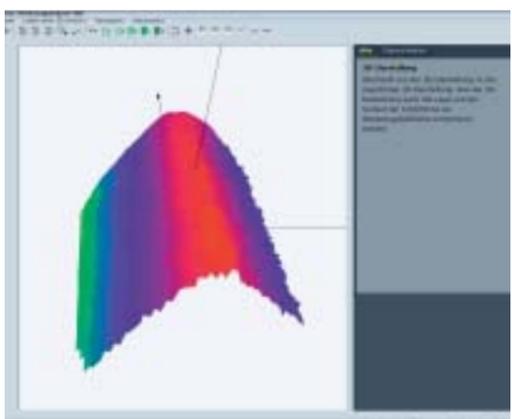
Select menu for measuring at the end:
Example: chisel edge angle



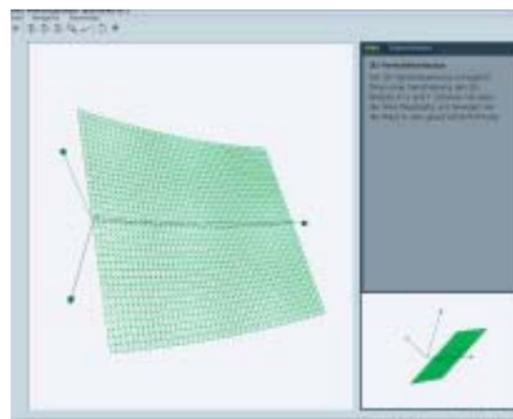
Configuration menu for user-specific settings:
Example: distance measurement



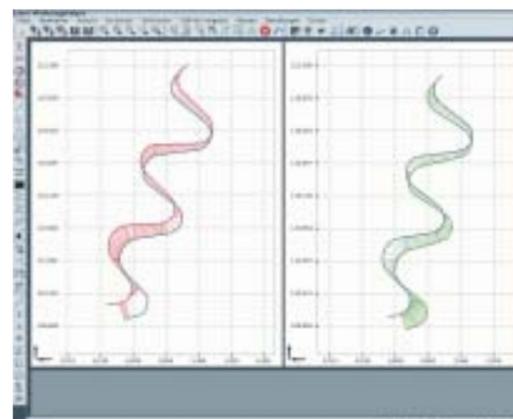
»expert« interactive configuration wizard:
Example: effective cutting angle/illumination



A 3D model of the scanned cutting edge is generated and output for evaluating the contour profile.

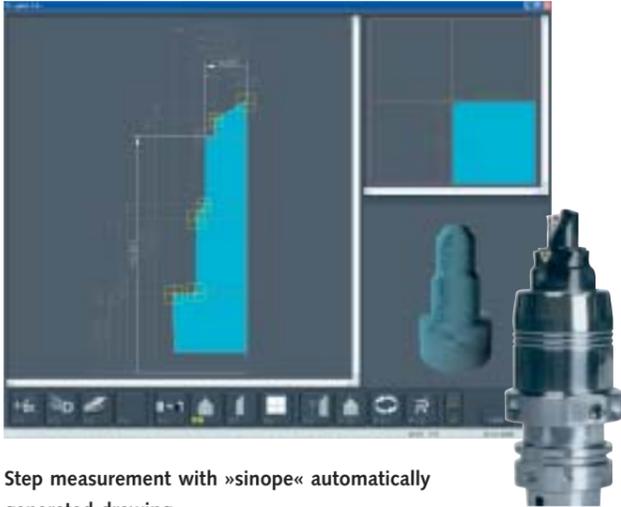


Chip space measurements are output not only as measured values but also as surface models for checking and assessing the profile of the scanned area.

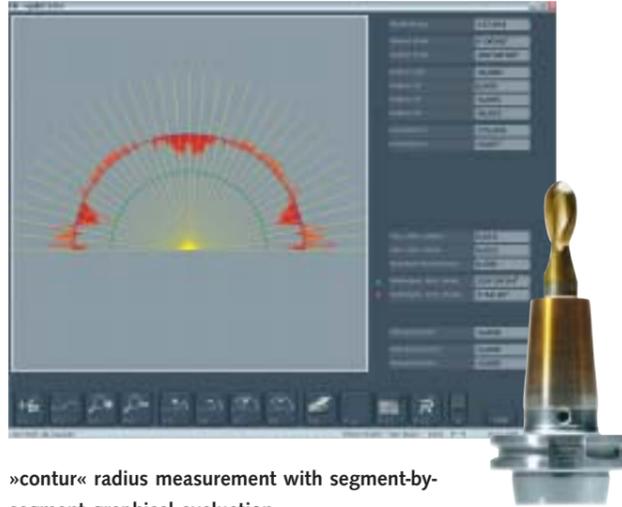


With »CoCon«, the outer contour of form tools is scanned (left) and the deviations automatically indicated (right). The data can then be used in the machine control system or programming system for correcting the erosion or grinding path.

From practice
Application examples



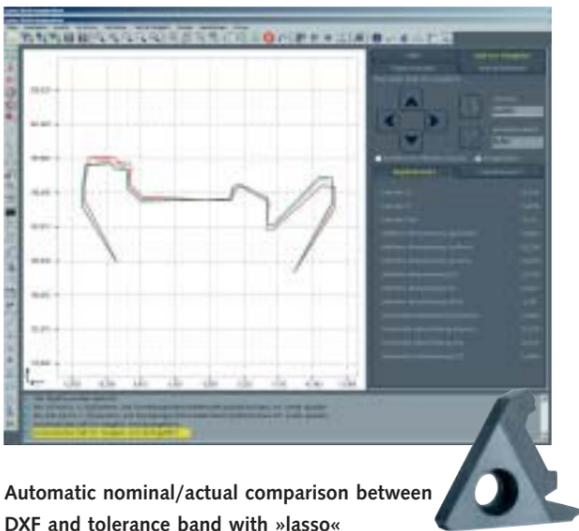
Step measurement with »sinope« automatically generated drawing



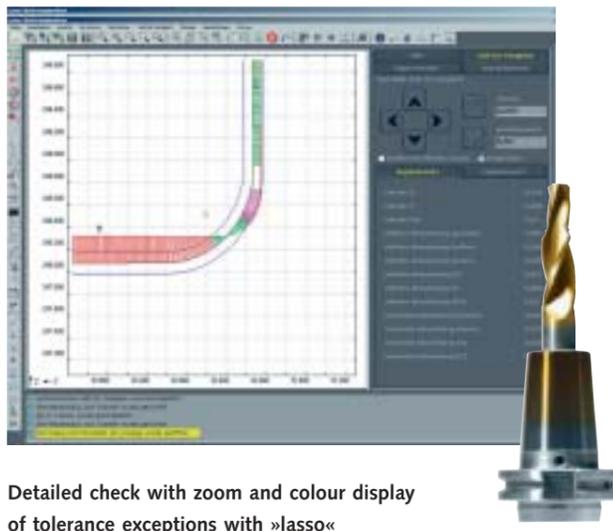
»contur« radius measurement with segment-by-segment graphical evaluation



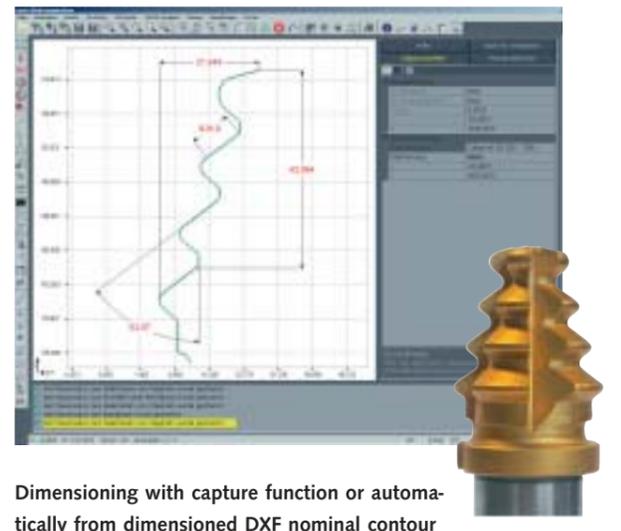
Axial incident light measurement of face geometry with »metis« for any desired parameter



Automatic nominal/actual comparison between DXF and tolerance band with »lasso«



Detailed check with zoom and colour display of tolerance exceptions with »lasso«

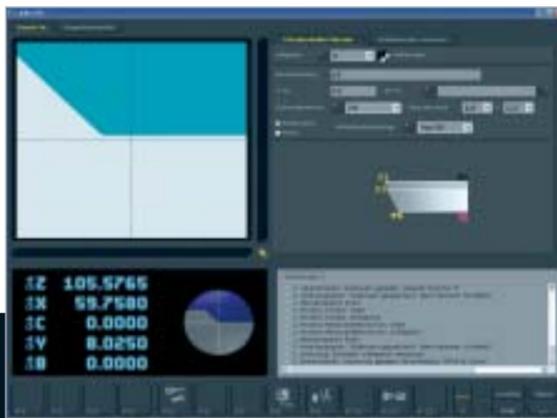


Dimensioning with capture function or automatically from dimensioned DXF nominal contour with »lasso«

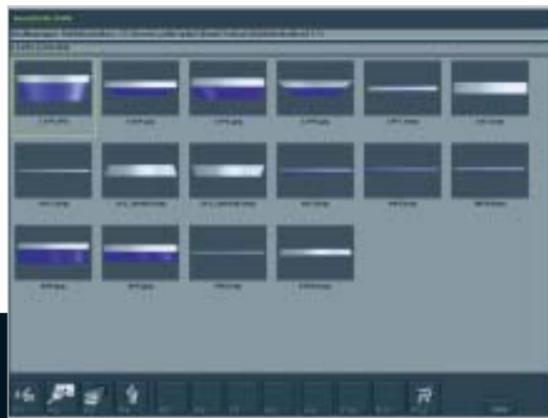
Measure and transfer data at the push of a button

Grinding wheels

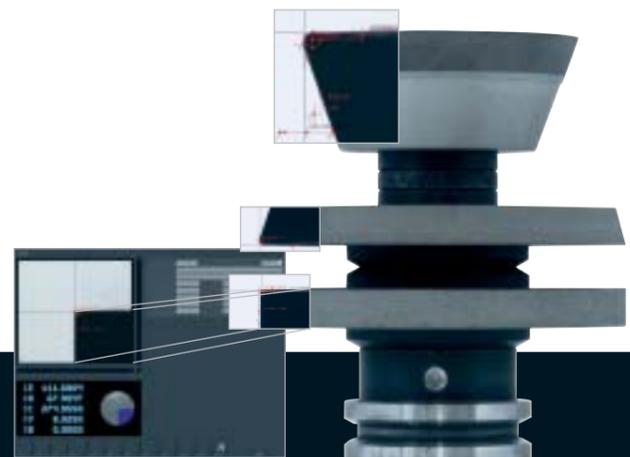
For measuring grinding wheel and grinding wheel package profiles easily and reliably, and transmitting the results conveniently to the machine control system, there is ZOLLER »corvus«. Contour recording takes place by rotation in order to take into account wheel wobble errors and to determine exactly the contour which is produced on the tool during the grinding process. Predefined measurement macros for 24 FEPA wheel types make fully automatic measurement easier. Combined with the »pilot 3.0« package generator, individual grinding wheel packages can be generated according to requirements. So that they are also available for future measurements, they are stored and managed in »pilot 3.0«, in groups if required. It couldn't be easier.



»corvus« grinding wheel software



Library of wheel types according to FEPA standard



Fully automatic measuring cycle

Meßwert	Mod	Wert	Diff	Tol
Flankmaß	Z	RA	60,1470	
Durchmesser	X	RA	99,8220	
Radius	Ra		0,2450	
Belagwinkel 1	W1		70,40	
Belagwinkel 2	W2		0,00	

Clear display of measurement results in »pilot 3.0«

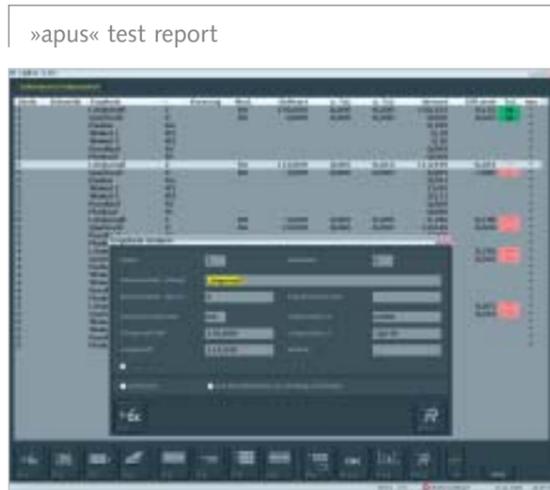
Seamless documentary proof thanks to test reports

Documentation

The quality of the precision tools delivered is critical for your customers. Proving this quality is critical for you: Because you are covered 100% in the event of a complaint thanks to airtight test reports, created with ZOLLER measurement technology which is recognised on the market. No ifs, ands, or buts.

With this seamless documentation you can demonstrate your high quality to your customers and thus stand out clearly from your competitors.

Meaningful documentation is the best way to show your customers how the delivered tools have been sharpened or manufactured. In the event of a complaint, the test reports can be used to prove that the goods are in order. Free deliveries of replacement tools or even disagreements with the customer are ruled out, your company's reputation is beyond any doubt. Can there be any better reasons for seamless documentation?



Editable »apus« test report for adaptation of description and scope of the printed measured values as required. The manufacturer address and company logo can be included if desired.



Graphical evaluation of concentricity and radial run-out of the cutting edges with automatic cutting edge correction for multi-insert cutting tools (saw blades, milling heads).



The measured values of saved tools are recorded automatically with each measurement, can be evaluated statistically and called up at any time.

Save and export function for all measurement and test reports. Display on monitor, output via network or USB stick.



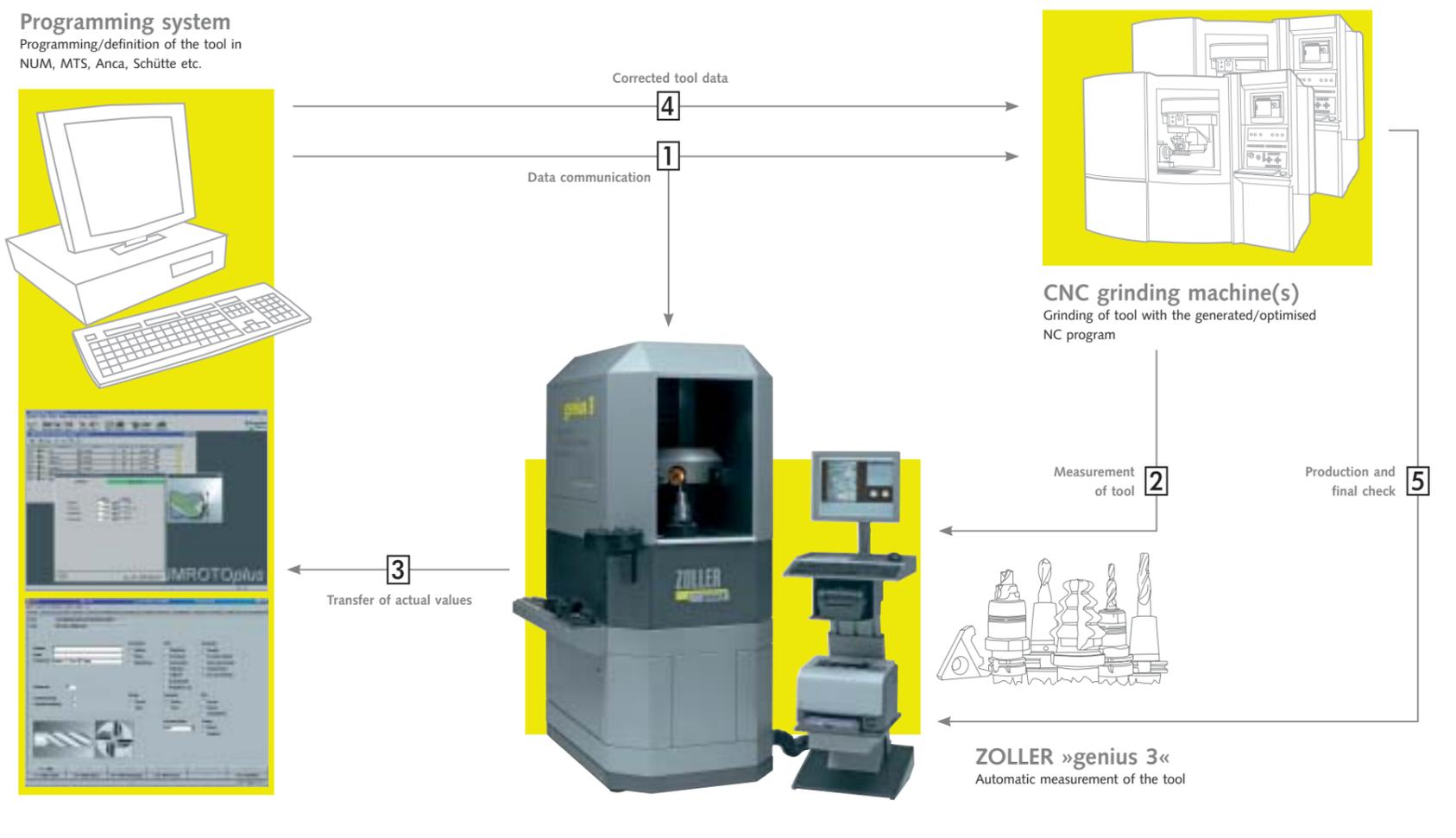
Tested quality thanks to ZOLLER:
 Optimally checked and tested tools are your guarantees for high quality, on-schedule delivery and a low number of complaints. Use it for yourself!

ZOLLER interfaces For smooth operations

Interfaces are a prerequisite for paperless and process-reliable production in the grinding and sharpening business. How helpful it is that ZOLLER interfaces to grinding machine controls allow precisely this kind of automation!

ZOLLER interfaces open up whole new worlds of saving potential to you: With the grinding program, the data set for »genius 3« is generated and the fully automatic measuring cycle is produced. The measured data is then transferred back to the programming system or grinding machine, depending on the type of interface, and the grinding program is temporarily corrected. Programming time and machine downtimes are reduced to a minimum in this way. You save time and costs – and also avoid errors when inputting data and creating a new grinding program.

Producing new tools | Processing of nominal data which has been programmed with NUM, MTS, Anca, Schütte etc.



1 Data communication

The NC program for grinding the tool is transferred to the CNC grinding machine. At the same time, the programming system sends a measurement data file to the »genius 3«, from which ZOLLER generates a fully automatic measuring cycle.

2 Measurement of tool

The tool is ground on the CNC grinding machine. The tool is then immediately measured in a fully automatic manner on the ZOLLER »genius 3«. The benefit to you: No time spent on programming a measuring sequence on the ZOLLER »genius 3«.

3 Transfer of the measured actual values

The measured actual tool data is transferred back from the ZOLLER »genius 3« to the programming system. The NC program can be corrected on the basis of this data.

4 Corrected tool data

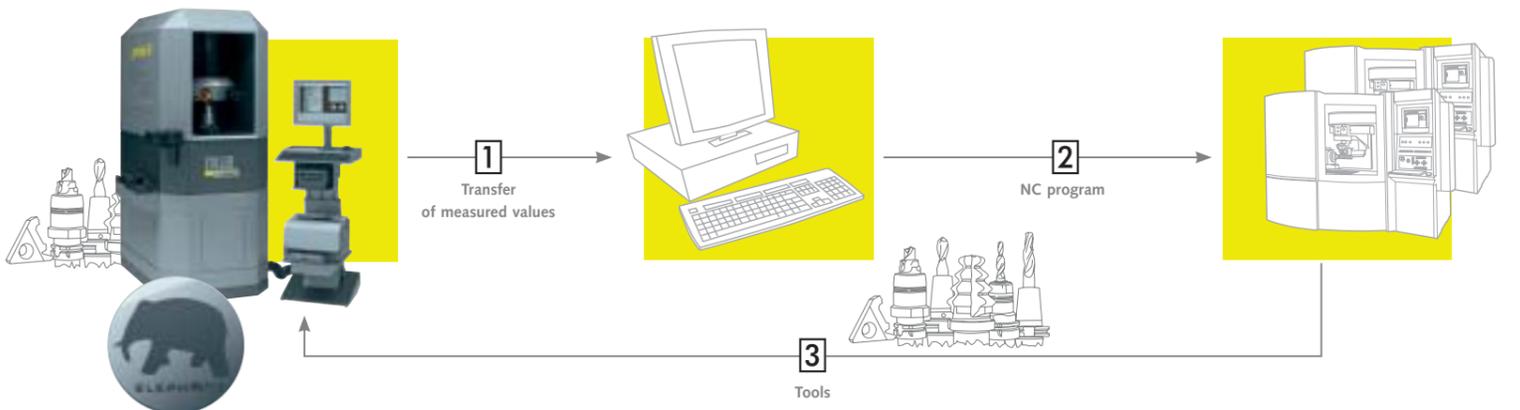
Based on the actual tool data, the optimized NC program can be transferred to the machine. The tool is ground correctly.

5 Start of production

Production of the tools can start. The ZOLLER »genius 3« measures and logs the ground tools. No time is spent programming with the ZOLLER »genius 3«!

Re-sharpening/re-engineering | Measuring an unknown and worn tool

ZOLLER »genius 3«
with »elephant«



1 Pattern recognition of unknown tools

A worn tool is measured and scanned fully automatically with the ZOLLER »elephant« on the »genius 3« without knowledge of the tool dimensions/nominal values. The measured values are transferred to the machine control system or to the programming terminal (Anca, MTS, Num, Schütte, etc.). The »genius 3« measuring sequence is saved.

2 Create NC program

The programming system receives the measured parameters from the ZOLLER »genius 3« so the programming is much shorter. The NC program is transferred to the CNC grinding machine. The tool is re-ground or a new tool with the same data as the master tool is produced.

3 Measurement of the ground tools

The ground tools are brought to the ZOLLER »genius 3« and are measured and logged there fully automatically with the measuring sequence already present.

Form tools/development | Recording a complex form tool for production or correction

CAD drawing
or tool pattern



1 Recording of actual contour

The contour of the form tool is scanned fully automatically and accurately to the micrometer with ZOLLER »genius 3« and recorded as a closed contour using thousands of co-ordinate points. Only the start and end points of the measuring task are carried over by playback input.

2 Data communication to the programming system/machine

The contour scanned automatically by »genius 3« is exported in TXT or DXF format. The file is transferred to the programming system or directly to the machine control system.

3 NC program

The programming system generates the NC program for the grinding or erosion machines using the contour supplied by the »genius 3«.

4 Check

The first ground tool is automatically scanned on the »genius 3«, and as soon as a generated nominal contour is present in DXF format, a nominal/actual comparison is carried out using the tolerance band. Furthermore, the deviation can be inverted with the »CoCon« software on the »genius 3« and the recalculated correction contour (new path) can be exported.

5 Transfer of corrected data

The data corrected with the ZOLLER »CoCon« software is transferred back to the programming system or directly to the machine. The second tool is produced with an optimised program, which takes into account grinding wheel errors or technologically induced machine deviations.

Benefits for you:

- Automatic generation of the measuring sequence for measuring and testing tools
- Fully automatic contour correction in form tools
- Fully automatic measurement and data communication of the grinding wheel sets
- Less programming time when tools are resharpened
- Seamless documentation with automatically generated and saved test reports

- ✓ Outer contour
- ✓ Cut-out length
- ✓ Cut-out angle
- ✓ Diameter
- ✓ Corner radius
- ✓ Drop
- ✓ Chamfer width
- ✓ Chamfer length
- ✓ Chamfer angle
- ✓ Axial chamfer width
- ✓ Radial chamfer width
- ✓ Flank face difference
- ✓ Axial clearance angle 1 + 2
- ✓ Radial clearance angle 1 + 2
- ✓ Relief diameter
- ✓ Relief radius
- ✓ Relief angle
- ✓ Hollow angle/angle at centre
- ✓ Core diameter
- ✓ Cone angle
- ✓ Centre offset
- ✓ Flute depth
- ✓ Opening angle
- ✓ Chisel edge length
- ✓ Chisel edge centre offset
- ✓ Chisel edge radius
- ✓ Chisel edge angle
- ✓ Tooth distance
- ✓ Tooth height difference
- ✓ Axial offset
- ✓ Cutting edge preparation
- ✓ Protective chamfer height
- ✓ Protective chamfer angle
- ✓ Effective cutting angle
- ✓ Helix angle
- ✓ Point angle
- ✓ Pitch
- ✓ Web length
- ✓ End gash width SSL 1
- ✓ End gash position SSL 2
- ✓ End gash radius
- ✓ Axial rake angle
- ✓ Step length
- ✓ Corresponding angle
- ✓ Graduation tolerance
- ✓ Torus diameter
- ✓ Taper
- ✓ Full radius - contour
- ✓ Tooth geometry
- ✓ Tooth face width
- ✓ Centring radius
- ✓ And many more

* Number of transferable parameters dependent on interface version

Unique selling points

Why should it be a ZOLLER »genius 3«?

Demands made of metal cutting increase by the day. In order to achieve the necessary accuracy, numerous prerequisites must be fulfilled. But how is "accuracy" even defined?

And how is it proven? Specifically using tools?

In order to meet current quality management systems such as DIN EN ISO 9001:2000, VDA 6.4, QS 9000, it is becoming increasingly important for every company to guarantee and prove consistent measurement accuracy. ZOLLER tool measuring units measure correctly and accurately. And with the standardised ZOLLER »tethys« measuring unit performance tests, you'll receive a guarantee of it – documented in writing and in detail. The benefit to you: A high level of reliable measuring accuracy which is in turn reflected in the quality of your tools.



»tethys« software for proving measuring unit performance on the ZOLLER »genius 3«



» ZOLLER has the simple solution. n.

- Ergonomic, innovative design to make work fun – day after day.
- High-precision »A.C.E.« spindle for guaranteed rapid tool changing.
- »pilot 3.0« image processing software, which carries out complex measuring tasks simply with the »elephant« function.
- ZOLLER is the expert in the field of tool measuring units and is continuously developing its »pilot 3.0« software. So the future is in safe hands.
- Whole grinding wheel packages can be created, measured and managed.
- Seamless documentation for each tool for your records and exemplary customer service.
- Interfaces to all well-known programming systems and CNC grinding machines for smooth, efficient processes.
- An extremely high level of accuracy, which ZOLLER supports and demonstrates with the »tethys« measuring unit performance test.

» With ZOLLER you have the edge.

- A thriving, independent, family-owned business in its third generation with locations worldwide.
- ZOLLER has expertise in development, sales and service.
- More than 25,000 presetting and measuring units and tool measuring units have been sold worldwide since 1968.

» With ZOLLER you set the standard.



The ZOLLER seal of quality guarantees quality and precision, reliability and cost-effectiveness. That's what ZOLLER stands for.



The ZOLLER seal of technology stands for the highest level of innovation: ZOLLER is developing the technologies today which you will need tomorrow.

» ZOLLER is there for you – all over the world.

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