ZOLLER
expect great measures

The High-Precision Universal Measuring Machine for Tool Manufacturing and Grinding Facilities

genius

Tool Quality – Automatic and Precise

As a tool manufacturer or grinding operation, you are expected to deliver excellent quality. Universal measuring machines in the »genius« series use precise measurement data to deliver unmistakable proof of the excellent production quality offered by your grinding machines.

Prevent complaints and offer your customers perfectly documented quality. The »genius« series of measuring machines check your tools through a fully automatic process using precise measuring technology and comprehensive measuring programs.

»genius« means simple operation and excellent future reliability. Whether you are simulating future measurement processes, networking your production or want to exchange tool data with CNC grinding centers: »genius« makes quality assurance ingeniously simple.

»genius«

Five Master Measurement Experts

Machining a cutting tool is a specialized task. Cutting tools must be measured and inspected with precision - a task best left to an expert. The »genius« tool measuring machine offers the right expertise for any challenge you face when measuring and inspecting your cutting tools.

With a »genius« measuring machine, you can measure over 100 parameters through a fully automatic process for most tool types, with impressive precision.

The four experts »titan«, »threadCheck«, »3dCheck« and »edgeControl« fulfill additional special requirements, such as measuring micro-geometries and threads, 3D digitization or in-depth analysis of wear and tear and defects.

Choose the right »genius« series measuring machine for your needs, and you will receive precise measurement data for your tools and processes down to the µm.

Each measured value helps to improve the quality of your products.

»genius«

Measures over 100 parameters for standard and small tools in 2D/3D

Page 22

»titan«

Also measures micro-geometries on the cutting edge through a fully automatic process

Page 26

»threadCheck«

Also measures helical cutting tools such as taps, thread formers and thread gages

Page 30

»3dCheck«

Creates 3D tool models and measures geometries of standard tools

Page 34

»edgeControl«

Detects and measures defects and wear and tear along the cutting edge in a fully automatic process

Page 38

Precision Measuring Technology

ZOLLER »genius« always guarantees precise measuring results down to the µm even in a production environment. The »genius« offers precision measurement technology thanks to highly precise mechanical components and optics system. The »pilot 4.0« operating software allows a personalized interface for each user. »pilot 4.0« operating software offers personalized convenience for every user.

The »genius« is designed to handle measurement work for years to come, even when placed directly on the shop floor in a multi-shift operation.

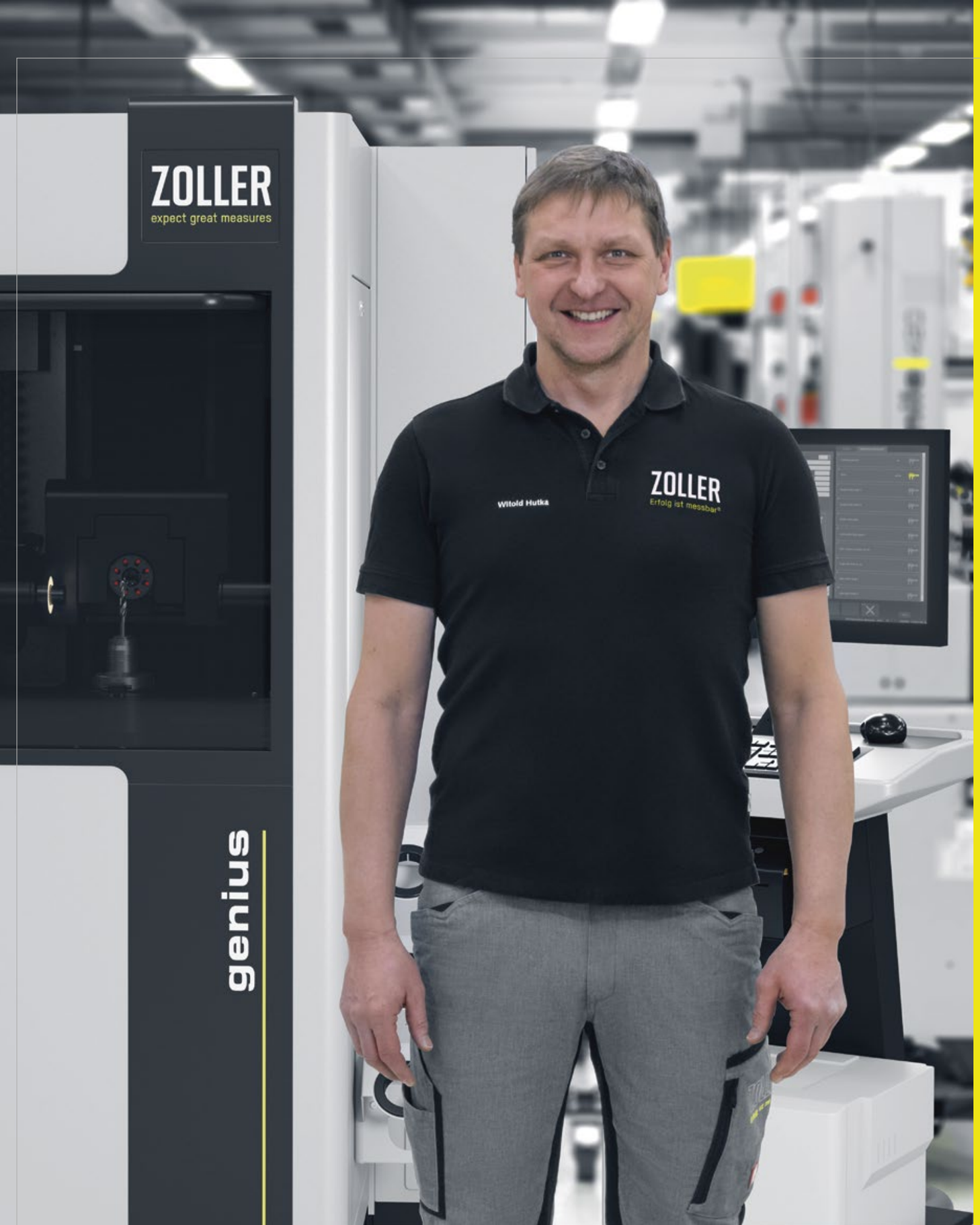
In short: »genius« is easy to handle and extremely robust.

»genius«

Overview of the »genius« Series

	Specialist in ...	Max. tool length	Maximum tool diameter D (with / without swivel mechanism)	Maximum snap gauge diameter D	Number of axes	Weight
»genius«	Measure standard and small tools	600 mm	- / 400 mm	100 mm	5	820 kg
»titan«	Measure geometries on standard tools and detect cutting edge preparation	600 mm	100 mm / 6 inches / 100 mm / 12 inches	75 mm	6-7	1,400 kg
»threadCheck«	Measure threaded tools	600 mm	260 mm / -	100 mm	6	820 kg
»3dCheck«	Create 3D tool models and measure geometries on standard tools	600 mm	- / 100 mm	100 mm	5	1,400 kg
»edgeControl«	Detect and measure defects and wear and tear along the cutting edge	600 mm	- / 100 mm	100 mm	5	1,400 kg

We reserve the right to make technical changes. The depicted machines may include options, accessories, and control variants.



Witold Hutka, Measuring Machine Assembly Technician at ZOLLER

“Every »genius« is a Promise”

“For me, assembling each and every »genius« is a personal project through which I renew ZOLLER's quality promise to our customers.

As an assembly technician, I know every assembly group and every screw. Every component that makes a »genius« so amazingly precise and versatile passes through my hands. And I know from years of assembly experience why the construction of the »genius« is so unbelievably solid.

That’s why I can assure you: When you buy a »genius«, you will get a machine that will impress for its precision and long service life.”

Success in Precision

A tool measuring machine is only truly outstanding if it can make its unique precision available to everyone. With a ZOLLER »genius«, any operator can easily achieve the best results right from the start – with consistent support from high-performing software, smart ergonomic elements and comprehensive automatic functions.

Sliding Door with Handle

Keeps external influences like dirt or external light out reliably during measurement, is designed to save space and available as an automated version.

Ergonomic Single-Hand Operating Device »eQ« (ergonomic & quick*)

For manual operation of measurement axes in the X, Y and Z directions. The button with the solution symbol can be individually configured with other practical functions, such as tool clamping. This makes operation even simpler.

Transmitted Light Camera with Multi-LED Lighting

Industrial digital camera with high-quality, low-distortion optic and telecentric transmitted light for measuring cutting edge contours precisely down to the µm, as well as step geometry in the silhouette at up to 5 MPx. High refresh rate for fast focus and contour photography from tool rotation. multi-LED ring light for bright, high-contrast illumination of the cutting edge and inspection in incident light.

Incident Light Camera with Multi-LED Lighting

For inspection and measurement of tool geometries on the circumference, in the flute and on the face. Simply enter the target parameter into the measuring program dialog box and every variable is measured and logged automatically: Rake angle, clearance angle, flute form and chamfer width. The eight high-power LEDs can be controlled separately, and provide optimal illumination of the cutting edges with the help of automatic intensity regulation.

Convenient Membrane Keypad

Dust and dirt-resistant, impresses with a comfortable feel and ensures easy operation, even under workshop conditions.

Fully Automatic Swiveling Multisensor Optic Carrier »orthoScan«

The optic carrier on the »threadCheck« swivels. This allows cutting edge geometries on helical cutting tools such as taps or gear hobs to be measured without distortion. The optic carrier is also optionally available with an additional SKP sensor for measuring cutting edge preparation, or a or a touch probe. For more information see page 32.

Separate Electronics

Detaches electronic heat sources from the measuring process and provides optimal access for maintenance.

»pilot 4.0« Measuring Machine Software

Simple and clear, independent of the operator for reliable measurements, displays your personalized work interface on any ZOLLER device, flexible software design allows for customer-specific adjustments to be implemented quickly. More information is available from our ZOLLER Software Solutions brochure or at: www.zoller.info/pdf/Software-Solutions-EN

»ace« High-precision Spindle

Micron accuracy for loading and clamping all types of cutting tools. Can be adapted to many different tool holder systems thanks to the universal attachment holder interchange system.

»cockpit« Control Unit

Offers comfort and good ergonomics to operators thanks to individual adjustment options. The »cockpit« is height adjustable, and the monitor can be tilted.

Storage Options

Integrated shelves for fast access to tool posts and collet chucks. Installed on both the sides and in the interior: To ensure you always have your attachment holders available.

Certified by Experts

Every »genius« device is inspected in accordance with IEC 61010-1:2010. That means you receive verifiable, certified product safety.

DAkkS Deutsche Akkreditierungsstelle D-K-18994-01-00

TÜV SÜD C US

*available for »genius« and »threadCheck«

ZOLLER »ace« High-precision Spindle (All-Clamping Element)

The ball bearing in the spindle takes any attachment holder clearance-free and with high-precision. Round as well as unibody tools can be inserted and power clamped, ensuring precise and repeatable measurements.

Spindle hand wheel for convenient and reliable manual positioning of the C axis.

Ball bushing for clearance free and wear-free mounting of attachment holders.

Lock for precise positioning of the attachment holder.

Further Highlights of the ZOLLER »ace« High-Precision Spindle

- **Power-activated tool clamp –** consistent, independent of the individual user.
- **Tool post with integrated calibration spheres** for simple, fast and exact determining of the spindle zero point.
- **Fast tool post exchange** in less than 10 seconds.
- **High changeover accuracy** of attachment holders – better than 1 µm.
- **High concentrity and axial runout precision of the spindle** – better than 2 µm.
- **Spindle brake** for pneumatic positioning of the spindle in the desired position over the entire 360 °, for example to adjust the tool.
- **Spindle indexing** for defined positioning of the tool position in 4 × 90°, can be carried out using the membrane keypad.

*The ZOLLER »ace« high-precision spindle is available only for the »genius« and »thread-Check« versions.

Hydro-expansion cylinder D32 with interchangeable bushings D3 to D25mm and D1/8" to D1"

HSK 25 to HSK 125 hollow taper shank

SK 25 to SK 60 steep taper

Coromant-Capto from C3 to C10

Collet chuck adapter Babychuck D 32

Reversible cutting plate D32

Internal and external 2-jaw gripper

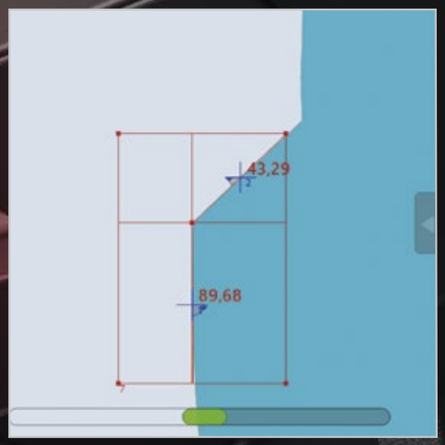
Tool holder fixture D32 mm with calibration edge

Membrane Keypad to Control Pneumatic Functions

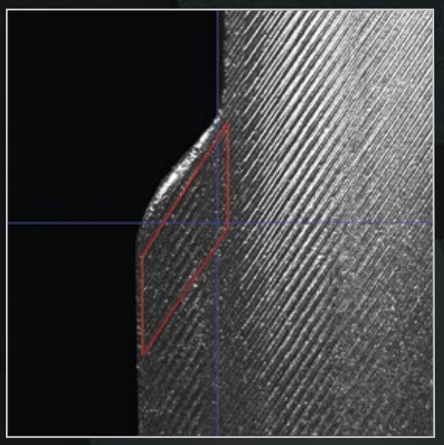
Measuring Technology for Surfaces and Edges

With »genius«, you can complete measurements in incident light and transmitted light with no contact, with the option of using measuring sensors and 3D measuring technology sensors. Utilize multi-sensor technology,regardless of surface compound angle. LED ring lights deliver the ideal illumination for inspecting the face, circumference and flute for any tool.

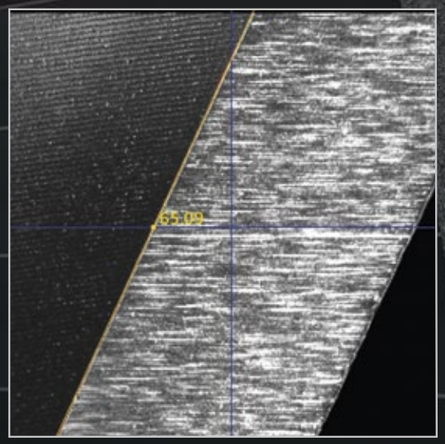
With a ZOLLER »genius« measuring machine, you can measure almost any feature of the tool, no matter how complex it is.



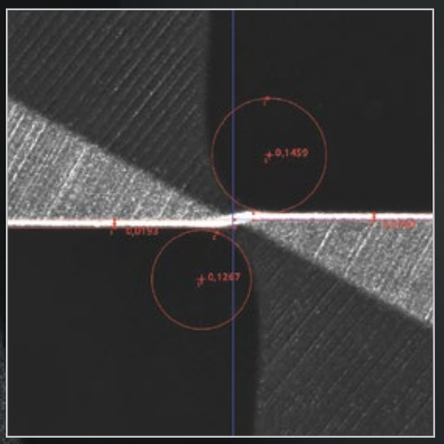
Transmitted light measurement in the profile.



Contour measurement in the flute



Incident light measurement on the circumference



Incident light measurement on the face

Built for Challenging Tasks

The ZOLLER »genius« series helps you achieve your goals - whether you choose a »genius«, »titan«, »edgeControl«, or »3dCheck«.

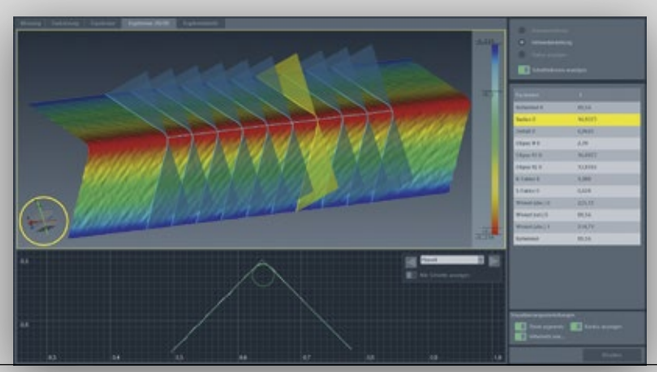
Utilizing state-of-the-art 3D technology, you can digitize your tools partially, on an area-specific basis, or in a volume model.

The »genius« series is universal, therefore you will find exactly the right technology to meet your production needs, no matter what challenges you face.

Cutting Edge Preparation

The ZOLLER »titan« enables you to inspect cutting edge preparation.

The »zep« sensor precisely digitizes the micro 3D topography. After evaluation by the »pilot« software, you can view analyses topographically, in grayscale, as sections or as tables in accordance with DIN. 3D models can be turned and scaled as needed



Wear Detection

»edgeControl« digitizes, analyzes and measures wear and tear along the cutting edges of your tools in a fully automatic process.

ZOLLER »pilot« software detects the position of the wear and tear and analyzes it automatically.

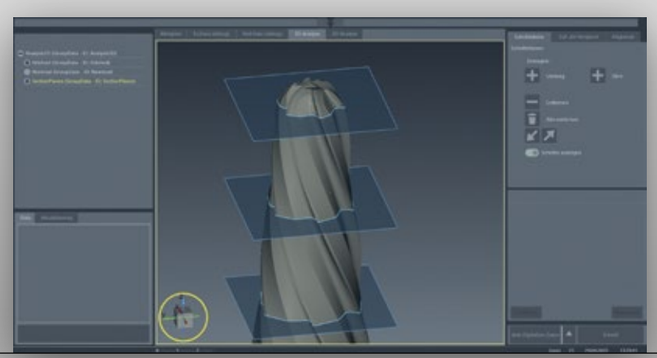
The results can be exported for efficient regrinding.

3D Model of Your Tool

The ZOLLER »3dCheck« enables you to create 3D models for your production processes and for reverse engineering.

The »Z3dCAM« optical 3D sensor records image data from many different objects, like cutting tools or workpieces.

The software then uses this data to calculate realistic, accurate and detailed 3D models.



Never Miss a Measurement –
The »expert« Measuring Program

»expert« is the specialist for measuring precision tools. The measurement program generates the optimal measuring procedure based on selected parameters. The program is fully automatic, repeatable, and with photo-realistic parameter selection.

Simply select and confirm the parameters to be measured and start the measuring procedure. »expert« guarantees that »genius« measures each and every detail of the tool.

Live camera image of the tool

Measuring window

Current position of the CNC axes

2D cutter shape

Measuring program selection

Measurable tool areas such as the circumference, flute and face

Photo-realistic display of measurement tasks on the tool

Selectable parameters to be measured, defining setpoints and tolerances

Navigation display

Virtual joystick to align and position the sensors

Digital Softkeys for spindle actuation as well as axes blocking.

Function buttons with self-explanatory icons

»genius«

Measures Standard Tools Down to the Micron

ZOLLER »genius« is the universal measuring machine for cutting tools. From quickly inspecting individual criteria to fully automatic and user-independent complete checks, »genius« checks your tools quickly, simply and with maximum precision. Your measuring results are documented in detail and can be transferred to grinding machines at the touch of a button. The high precision offered by »genius« is tested in accordance with ISO 17025.

Perfect Lighting

With 8x segmented, automatically adjustable LED ring lights, the optimal lighting situation for any measurement is always available. This guarantees absolute precision and repeatability.

Ideal Support

You don't need advance knowledge or professional expertise to comprehensively measure tools, just the universal measuring program 800 »expert«. You choose the parameters to measure – and »pilot 4.0« handles the rest.

Simple –
user-independent, perfect results

Precise –
measure geometries exactly down to the µm

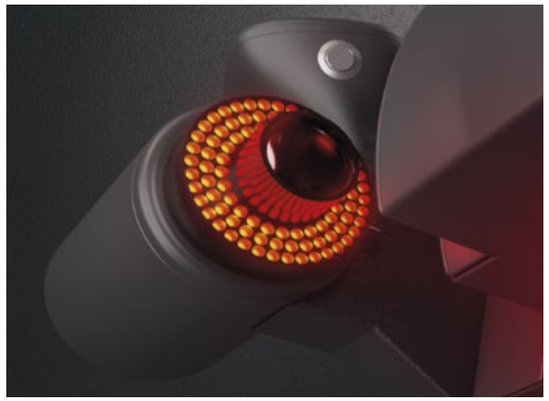
Innovative –
the next generation of the proven »genius«

genius

»genius« Highlights

Multi-talented:
DualCam* incident light camera
Optimized for the combined measurement of 2D and 3D geometries. 6 x 5 mm detection range for 2D and 1.2 x 1.0 mm for 3D. Bright lighting thanks to 8 LED segments, automatically positioned via CNC axis.

Precise and Universal: »ace« high-precision spindle
The »ace« spindle with pneumatic 4 x 90° indexing clamps any attachment holder free from play, wear and tear in a power-activated process. Saves time through attachment holder exchange in 10 seconds with changeover accuracy of less than 1 µm.



Sharp shooter: 5 MP transmitted light camera, field of view 3.6 x 3.6 mm*
The transmitted light camera with 1:1 lens displays small cutting edge geometries precisely. The user can zoom into the field of view up to 20x using the »pilot« software to display the geometries of small tools more clearly.

*Option

Application

2D Parameters	
Standard Diameter 2-100 mm	●
Large Diameter >100 mm	●
Micro Tools 0.1-10 mm	–
3D Measurement	
Partial	●
Area-specific	●
Volume Model	–
Measurement Tasks	
Cutting Edge Rounding	○
Wear	–
Roughness	–
Threading Tools	○

Sensor Configuration

Transmitted Light Optic	
Transmitted Light Camera HR70 4.4 x 4.4	●
Transmitted Light Camera 5 MP 3.6 x 3.6	○
Transmitted Light Camera 5 MP 15 x 14	○
Incident Light Optic	
Standard Incident Light Camera	●
Micro Incident Light Camera	○
DualCam System Incident Light Camera	○
Tactile	
Scanning Probe	○
3D Measuring Technology:	
Microsensor	○
Zep EdgePrep Sensor	–
Zep-R EdgePrep Roughness Sensor	–
3D Sensor Z3dCAM	–

Measuring Machine Configuration

Spindle	
Standard SK 50	○
Ace Spindle	●
High-precision Spindle	○
Hydroexpansion Spindle	–
ROD	●
Hollow Shaft Encoder	○
Linear Drive	
ZOLLER Traction	●
Ball Screw Form Fit	–
X, Y, Z Axis in Standing Version	●
X, Y, Z Axis in Cross Table Version	–
Optic Drive	
Incident Light Swivel Axis	●
Incident Light & Transmitted Light Swivel Axis	○
Vibration Damping	
Levelling Element on Machine Feet	●
Active	–
Material	
Light Metal Alloy	●
Granite	–

Precision

$E_{UXY, MPE1}$=1,5 µm + L/300 µm	●
$E_{UXY, MPE2}$=3,0 µm + L/250 µm	●

● Standard configuration
○ Available options
– Not available

»titan«

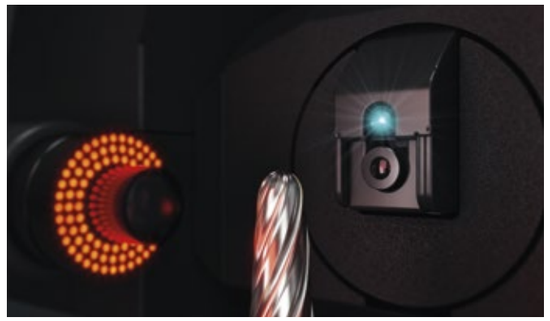
Champion with Maximum Precision

Anyone who needs the outstanding precision of a high-end inspection and measuring machine can enjoy the gold standard with »titan«.

Equipped with a CNC-controlled multi-sensor measurement system, a vibration-dampened base and automatic leveling, »titan« guarantees outstanding measuring accuracy for precision tools, micro-geometries and cutting edge preparation.

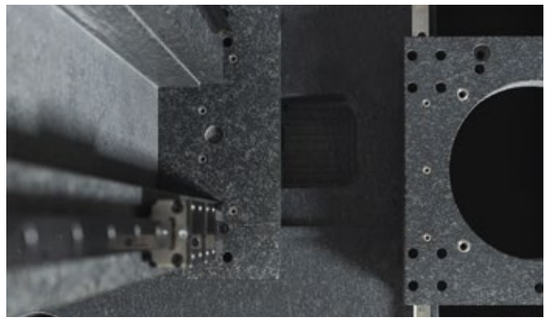
Cutting Edge Preparation with »zep« Sensor

The precise »zep« Edge Preparation Sensor with CNC swiveling axis measures cutting edge preparation automatically via stripe projection. The smallest measurable rounding is 3 µm.



High-strength Base Elements Made of Granite

»titan« supports its excellent geometric precision on solid base elements. Perfect for measuring technology, with excellent thermal and mechanical stability, long service life and torsional rigidity.



Comprehensive –
micro-geometries, SKP, 2D/3D and much more

Expandable –
options for future challenges

Vibration Isolated–
for outstanding precision in industrial applications

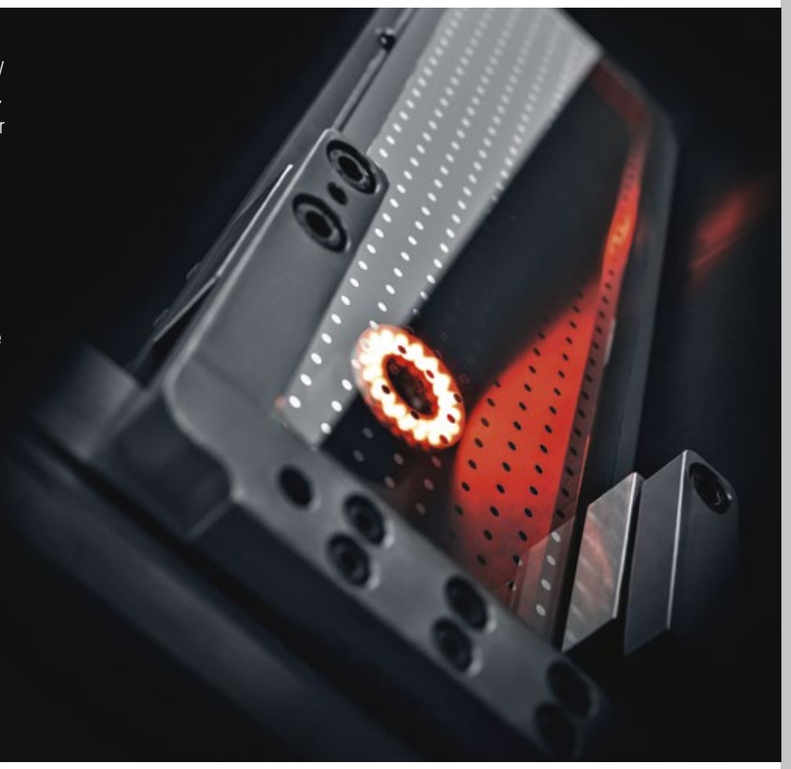
titan

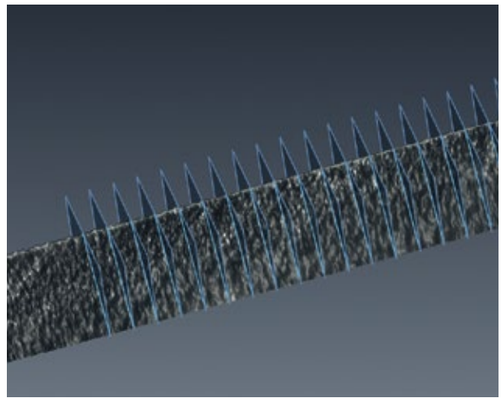
»titan« Highlights

Keep up with increasing demands for quality management. Thanks to ZOLLER technology, you can rely on consistent precision for your measuring machines.

Deviations in length measurements are calculated based on DIN EN ISO 10360 standards. ZOLLER measuring machines use highly precise calibration standards, made of Borofloat glass, to determine these deviations. According to this standard, at least 3 measuring sequences with 25,326 geometrical interconnections have to be completed. This process documents the precision of ZOLLER measuring machines in two dimensions, ensuring this information is traceable and clear at all times.

With ZOLLER, you can achieve excellent and consistent quality using measuring technology to analyze your tools.





Cutting Edge Rounding Displayed in »pilot 4.0«
Cutting edges can be displayed in different modes – such as surface rendering – to immediately detect any chipping and identify surface condition.

Hydroexpansion spindle*
Automatically clamps shank tools with up to a 32 mm diameter – and smaller tools with exchangeable sleeves.

Active vibration damping
Membrane air spring isolators precisely compensate for vibration and decouple the high-precision measuring technology.

*Option

Application

2D Parameters	
Standard Diameter 2-100 mm	●
Large Diameter >100 mm	–
Micro tools 0.1-10 mm	–
3D Measurement	
Partial	●
Area-specific	●
Volume Model	–
Measurement Tasks	
Cutting Edge Rounding	●
Wear	–
Roughness	–
Threading Tools	○

Sensor Configuration

Transmitted Light Optic	
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Micro Incident Light Camera	○
DualCam System Incident Light Camera	○
Tactile	
Scanning Probe	○
3D Measuring Technology:	
MicroSensor	–
Zep EdgePrep Sensor	●
Zep-R EdgePrep Roughness Sensor	○
3D Sensor Z3dCAM	○

Measuring Machine Configuration

Spindle	
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Hollow Shaft Encoder	●
Linear Drive	
ZOLLER Traction	–
Ball Screw Form Fit	●
X, Y, Z Axis in standing Version	–
X, Y, Z Axis in cross table Version	●
Optic Drive	
Incident Light Swivel Axis	●
Incident Light & Transmitted Light Swivel Axis	○
Vibration Damping	
Levelling Element on Machine Feet	–
Active	●
Material	
Light Metal Alloy	–
Granite	●

Precision

$E_{UXY, MPE1}$=1,2 µm + L/300 µm	●
$E_{UXY, MPE2}$=2,0 µm + L/300 µm	●

● Standard configuration
○ Available options
– Not available

titan

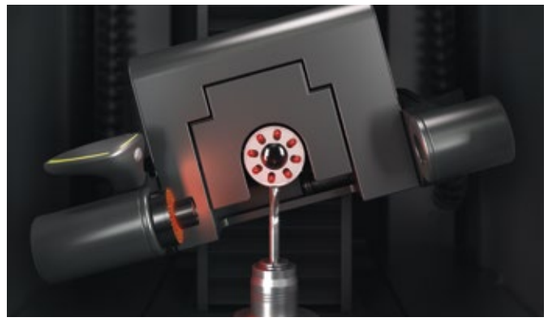
»threadCheck«

Measures Geometries of Threading Tools

Where common measuring technologies meet their limits, the »threadCheck« measuring machine from ZOLLER truly shines. Thanks to its six CNC axes and the swiveling multi-sensor optic carrier »orthoScan«, not only can you measure all kinds of cutting tools with absolute speed and precision, you can also measure threaded cutting tools to the µm and without distortion.

Swiveling Optic Carrier »orthoScan«

The swiveling multi-sensor optic carrier »orthoScan« always finds the perfect angle for viewing each tool. This ensures distortion-free measurements, precise down to the µm even for threaded cutting tools.



Measure without Programming: Thread Measuring module

With the ZOLLER thread measurement program for metric ISO, ANSI and Whitworth pipe threads, any parameter on tap drills, cutters, and shapers can be measured and logged with or without spiralization in a fully automatic process.

Distortion-free –
precise results for threading tools

Universal –
suitable for a large number of cutting tools

Fully automatic –
six CNC axes for any positioning task

threadCheck

»threadCheck« Highlights

High-precision angle measuring unit: Microsensor*
The microsensor is a laser sensor that can measure angles on micro surfaces, such as angles on K-land, with a width of 0.3 and 0.01 µm.

For fine details: Scanning sensor*
For electronic, tactile measurement of shape and position tolerances, for example, on gear hobs.
Available with sensor inserts of 0.3 to 2 mm diameter.

*Option

Application

2D Parameters	
Standard Diameter 2-100 mm	●
Large Diameter >100 mm	●
Micro Tools 0.1-10 mm	○
3D Measurement	
Partial	●
Area-specific	●
Volume Model	–
Measurement Tasks	
Cutting Edge Rounding	–
Wear	–
Roughness	–
Threading Tools	●

Sensor Configuration

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DualCam System Incident Light Camera	–
Tactile	
Scanning Probe	○
3D Measuring Technology:	
MicroSensor	○
Zep EdgePrep Sensor	–
Zep-R EdgePrep Roughness Sensor	–
3D Sensor Z3dCAM	–

Measuring Machine Configuration

Spindle	
Standard SK 50	○
Ace Spindle	●
High-precision Spindle	–
Hydroexpansion Spindle	–
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Hollow Shaft Encoder	○
Linear Drive	
ZOLLER Traction	●
Ball screw Form Fit	–
X, Y, Z Axis standing Version	●
X, Y, Z Axis in Cross Table Version	–
Optic Drive	
Incident Light Swivel Axis	–
Incident Light & Tansmitted Light Swivel Axis	●
Vibration Damping	
Levelling Element on Machine Feet	●
Active	–
Material	
Light Metal Alloy	●
Granite	–

Precision

$E_{UXY, MPE1}$=1,5 µm + L/300 µm	●
$E_{UXY, MPE2}$=3,0 µm + L/250 µm	●

● Standard configuration
○ Available options
– Not available

threadCheck

»3dCheck«

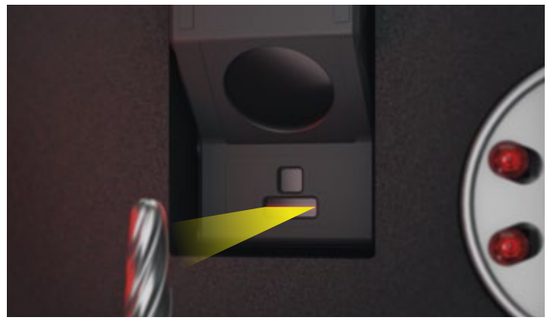
Captures, Digitizes and Analyzes Complex Tools

ZOLLER »3dCheck« is the perfect inspection machine for fast, process-oriented 3D digitization. It opens up new possibilities in tool measurement, offering a wide range of capabilities while remaining precise and user friendly. ZOLLER »3dCheck« combines the advantages of the optical ZOLLER »Z3dCam« (3D sensor) with high-precision CNC axes and fully automatic transmitted light image processing.

It pays off in the areas of reverse engineering, quality assurance, R&D and tool inspection, in particular: for example with time-saving image transmission in real time, convenient, intuitive ZOLLER software interface operation and the option of exporting and processing 3D measurement data to the customer's CAD system in a standardized format – with no contact and without damaging tools.

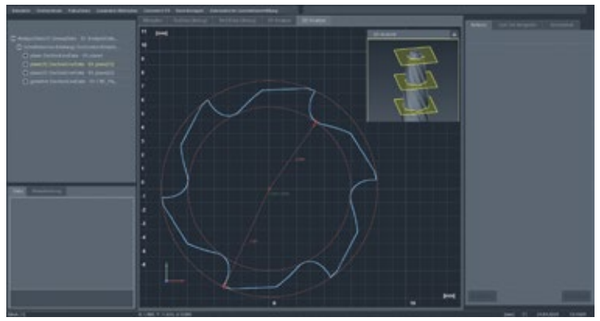
3D Sensor with CNC Axes and Image Processing

»Z3dCam« captures a wide variety of tool geometries and defined measurement ranges quickly and precisely. Tools can be reliably digitized from many different perspectives. »Z3dCam« is very well suited for workshop use thanks to its rugged design.



Topographical 3D Target/ Actual Comparison

The three-dimensional target/actual comparison with color-based, magnified presentation of deviations allows users to identify processing errors across the entire surface of the tool. This allows intervention in the production process in a faster, more targeted manner.



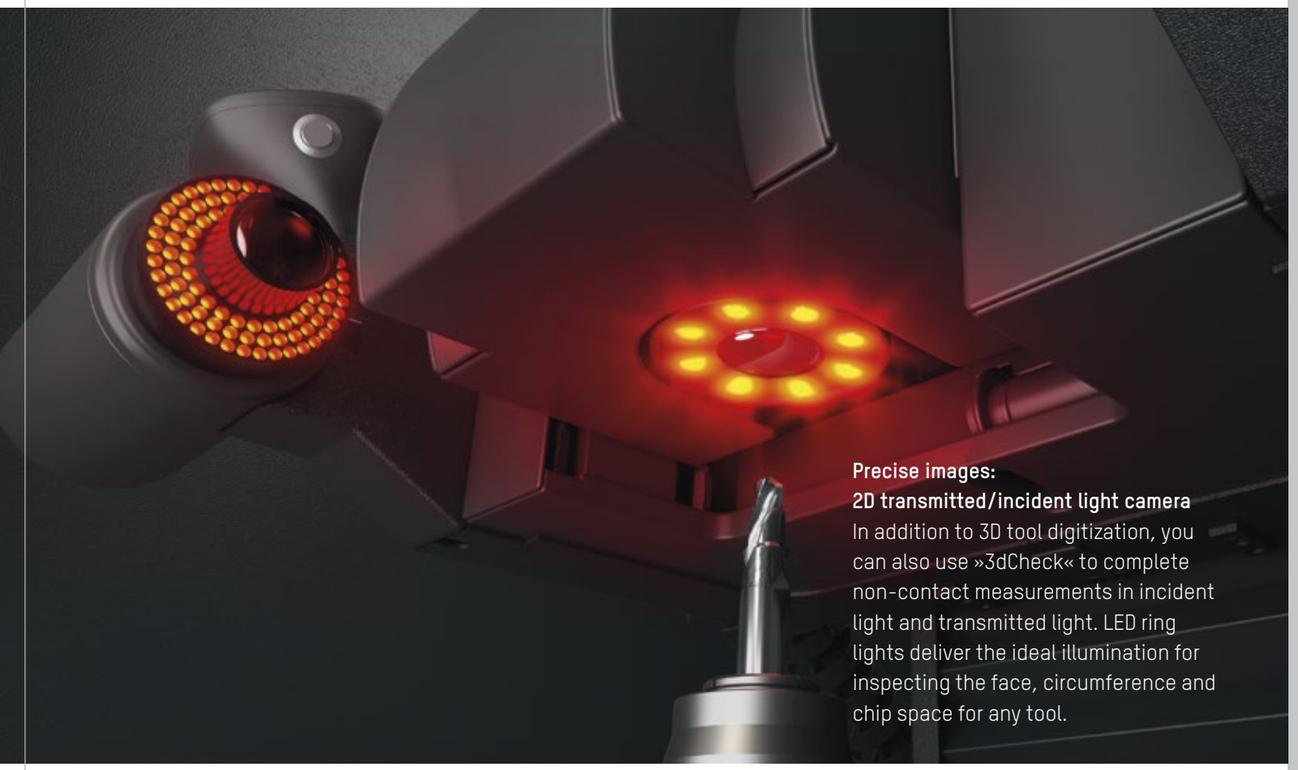
Process-oriented –
standardized, exportable 3D data

Flexible –
precise 3D digitization of tools

Quality assurance –
analysis routines, such as target/actual comparisons

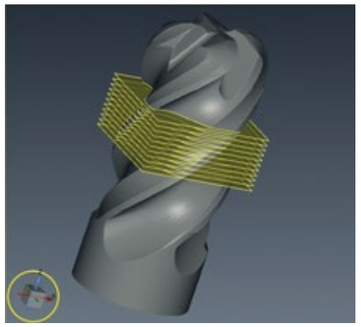
3dCheck

»3dCheck« Highlights



Precise images:
2D transmitted/incident light camera
In addition to 3D tool digitization, you can also use »3dCheck« to complete non-contact measurements in incident light and transmitted light. LED ring lights deliver the ideal illumination for inspecting the face, circumference and chip space for any tool.

Hydroexpansion spindle*
The hydroexpansion spindle clamps shank tools with diameters of up to 32 mm. Tools with smaller shank diameters can also be clamped reliably and in a power-activated process using exchangeable sleeves.



*Option

Application

2D Parameters	
Standard Diameter 2-100 mm	●
Large Diameter >100 mm	–
Micro Tools 0.1-10 mm	○
3D Measurement	
Partial	●
Area-specific	●
Volume Model	●
Measurement Tasks	
Cutting Edge Rounding	–
Wear	–
Roughness	–
Threading Tools	○

Sensor Configuration

Transmitted Light Optic	
Transmitted Light Camera HR70 4.4 x 4.4	●
Transmitted Light Camera 5 MP 3.6 x 3.6	–
Transmitted Light Camera 5 MP 15x14	○
Incident Light Optic	
Standard Incident Light Camera	●
Micro Incident Light Camera	○
DualCam System Incident Light Camera	–
Tactile	
Scanning Probe	–
3D Measuring Technology:	
MicroSensor	–
Zep EdgePrep Sensor	–
Zep-R EdgePrep Roughness Sensor	–
3D Sensor Z3dCAM	●

Measuring Machine Configuration

Spindle	
Standard SK 50	–
Ace Spindle	–
High-precision Spindle	●
Hydroexpansion Spindle	○
ROD	–
Hollow Shaft Encoder	●
Linear Drive	
ZOLLER Traction	–
Ball Screw Form Fit	●
X, Y, Z Axis in Standing Version	–
X, Y, Z Axis in Cross table Version	●
Optic Drive	
Incident Light Swivel Axis	●
Incident Light & Transmitted Light Swivel Axis	○
Vibration Damping	
Levelling Element on Machine Feet	–
Active	●
Material	
Light Metal Alloy	–
Granite	●

Precision

$E_{UXY, MPE1}$=1,2 µm + L/300 µm	●
$E_{UXY, MPE2}$=2,0 µm + L/300 µm	●

● Standard configuration
○ Available options
– Not available

»edgeControl«

Detects Tool Defects on Any Cutting Edge, Quickly and Automatically

Do you want to deliver 100% quality for your customers and ensure efficient regrinding? Do you need to detect chipping or wear on cutting tool edges quickly and precisely?

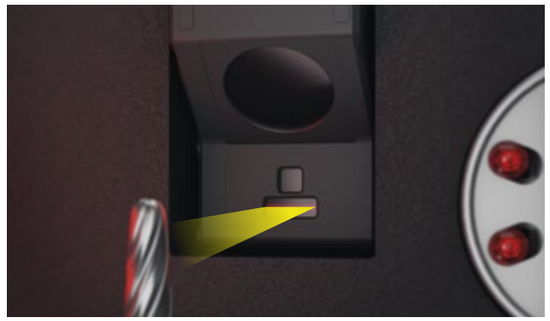
ZOLLER »edgeControl« with 3D sensor handles this challenging task for you. The sensor is aligned to the cutting edge in a fully automatic process, and the cutting edges are digitized in 3D with simultaneous axis path control. The subsequent analysis of the 3D model is also fully automatic and can be manually adapted as needed.

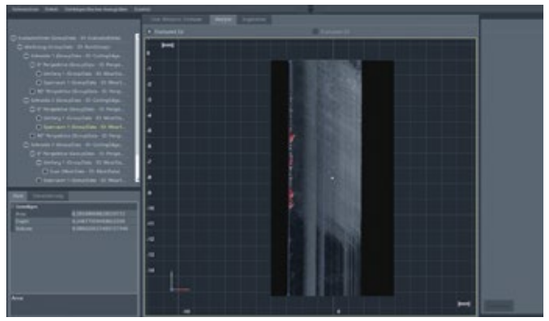
3D Sensor with CNC Axes and Image Processing

»Z3dCam« captures a wide variety of tool geometries and defined measurement ranges quickly and precisely. Cutting edges can be reliably digitized from many different perspectives. »Z3dCam« is very well suited for shop floor conditions thanks to its rugged design.

Software for Precise cuts

»pilot 4.0« identifies wear on cutting edges in a fully automatic process, calculates it and exports the data to the grinding machine in a format appropriate for the control technology. Your tools are ground optimally for longer service life. This improves quality and the efficient use of resources.





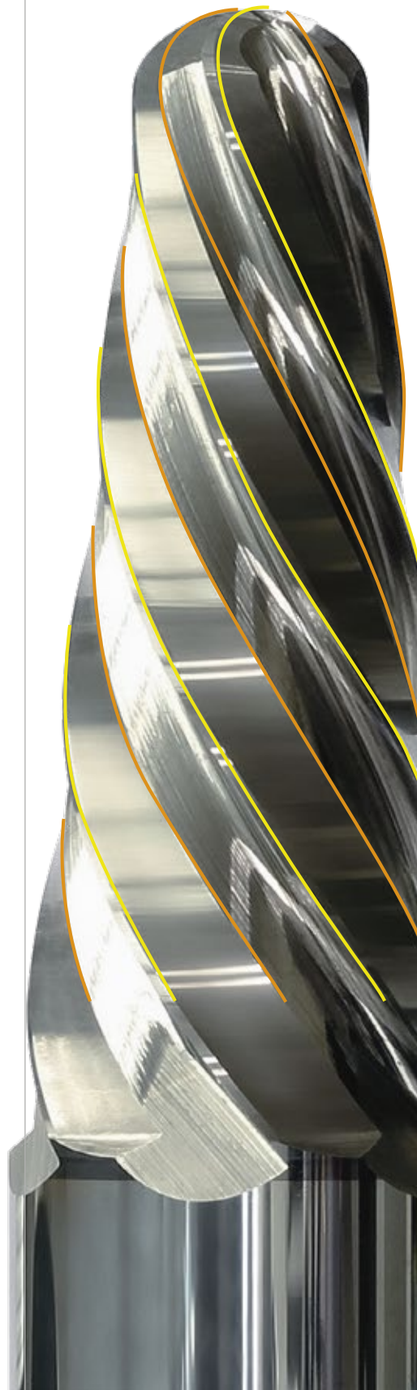
Reliable –
detects even small perforations on the cutting edge

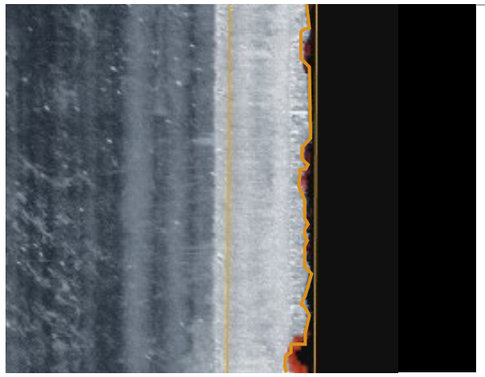
Non-contact –
precise inspection that doesn't damage tools

Traceable –
seamless documentation of all measuring results

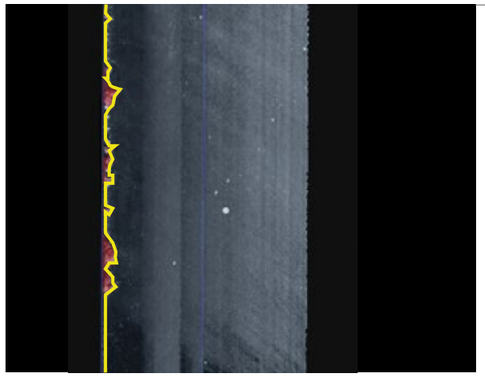
edgeControl

»edgeControl« Highlights

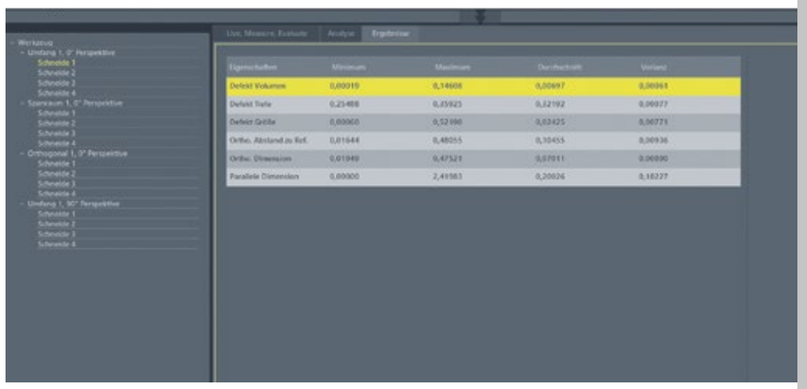




Wear evaluation on the clearance angle



Wear evaluation in the flute



Test report with measurement data

Application

2D Parameters	
Standard Diameter 2-100 mm	●
Large Diameter >100 mm	–
Micro Tools 0.1-10 mm	○
3D Measurement	
Partial	–
Area-specific	–
Volume Model	○
Measurement Tasks	
Cutting Edge Rounding	–
Wear	●
Roughness	–
Threading Tools	–

SensorConfiguration

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Standard Incident Light Camera	●
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Tactile	
Scanning probe	–
3D Measuring Technology:	
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Zep EdgePrep Sensor	–
Zep-R EdgePrep roughness Sensor	–
3D Sensor Z3dCAM	●

Measuring Machine Configuration

Spindle	
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Linear Drive	
ZOLLER Traction	–
Ball Screw Form Fit	●
X, Y, Z Axis in Standing Version	–
X, Y, Z Axis in Cross Table Version	●
Optic Drive	
Incident Light Swivel axis	●
Incident Light & Transmitted Light Swivel Axis	–
Vibration Damping	
Levelling Element on Machine Feet	–
Active	●
Material	
Light Metal Alloy	–
Granite	●

Precision

$E_{UXY, MPE1}$=1,2 µm + L/300 µm	●
$E_{UXY, MPE2}$=2,0 µm + L/300 µm	●

● Standard configuration
○ Available options
– Not available

edgeControl

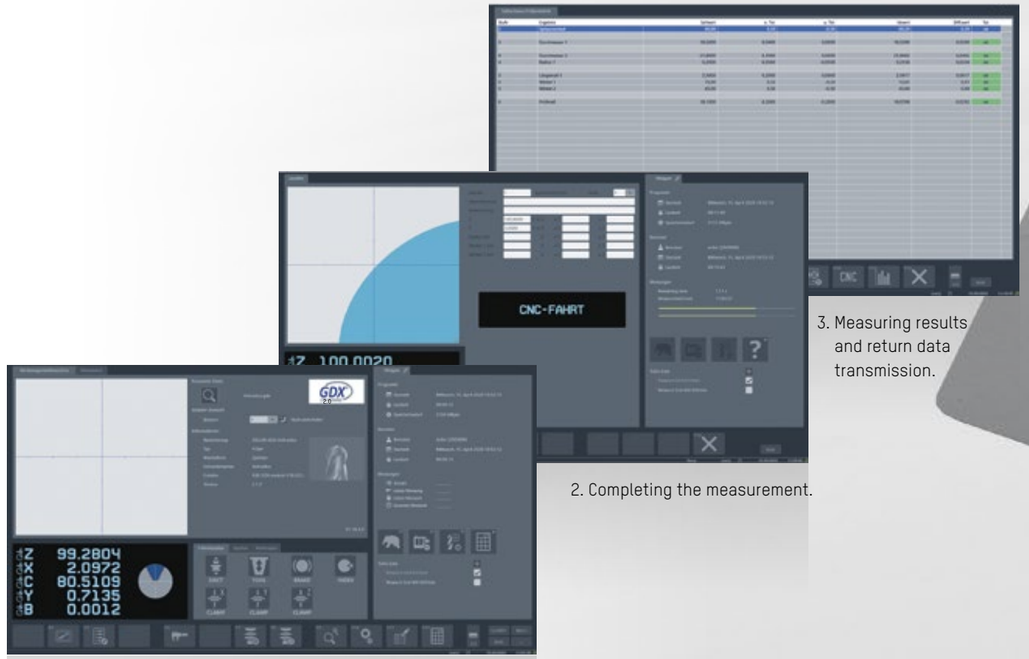
Digitized Measurement Data – Process Optimization with ZOLLER

There is an increasing demand placed on tool grinding and sharpening for cutting tool manufacturers. Traceability and process security are becoming the standard. With ZOLLER, you can handle these challenges with ease.

ZOLLER interfaces ensure smooth processes by opening up all new options for saving money and improving productivity: The grinding program is used to generate the base data for the measuring device, and the fully automatic ZOLLER measuring sequence is generated from it at the same time. Depending on the type of interface used, the measured data is transferred back to the programming system or the grinding machine and the grinding program is temporarily corrected.

This reduces programming effort and machine downtimes to a minimum. You save time and costs – and avoid errors in data input when creating a new grinding program, since the software is user-independent.

ZOLLER offers the corresponding interface to almost all systems involved in the grinding process, for example GDX, NUMROTO, Anca, MTS, and many more.
From »genius« to »smartCheck« or »smile«: all ZOLLER devices can transmit actual/target tool data in a paperless process (depending on the scope of service/measurement).



1. Access the interface and loading of target data.

2. Completing the measurement.

3. Measuring results and return data transmission.

ZOLLER measuring machines communicate with grinding machines from many different manufacturers.

ANCA CNC MACHINES · GDX STANDARD · haller HAWEMA · HARO TECHNOLOGIES LTD. · ISBE Solutions for Cutting Tools · MIKRON TOOL · MTS AG · num · ISOG · ITM · ROLLOMATIC · SAACKE · Schütte · star · strausak Rollomatic Group · TGT Tool Grinding Technologies Inc. · ULMER WERKZEUGSCHLEIFTECHNIK · VOLLMER · WIDIA

Measuring Technology 4.0 – Networked and Precise to the µm

Networking unleashes the potential of measurement data precise to the µm from ZOLLER measuring machines. ZOLLER has developed networking options and interfaces for tool data that are unique around the world.

A new tool is being programmed on the grinder or, more commonly, on an external programming station. After a successful simulation of the grinding process, the actual grinding can begin. At the same time, a tool specific data file is sent from the grinding platform to the ZOLLER measuring machine. The operator can select which tool features to focus on. The file contains all necessary data to allow the measuring machine to fully and automatically create a measuring sequence. Once the first piece is completed it is loaded and measured automatically and user-independently on the ZOLLER measuring machine. Upon completion of the measurements, the actual tool data is transferred to the grinder. There, possible deviations from the nominal are displayed in a table and then integrated into the grinding program. The nominal values are not altered. Rather, a transparent temporary adjustment value to nominal is being set. The second tool then will be in tolerance.

1

Definition of Tool/Programming/ Data Transmission
The production process for tool manufacturing is programmed in existing programming systems from tool grinding machine manufacturers. The NC program used to grind the tool is transmitted both to the CNC grinding machine and to »genius«. ZOLLER uses it to generate the measuring procedure fully automatically.

2

Grinding the First Tool
The new tool is ground on the CNC grinding machine.

3

Tool Measurement and Data Transmission
The ground tool is measured on the ZOLLER »genius« according to the previously generated measuring procedure in a fully-automatic process. Then, »genius« sends the actual tool data back to the grinding machine or programming system.

4

Series production
The grinding machine optimizes the CNC program based on the transmitted actual tool data. Then batch production starts for tools manufactured precisely to the µm. The »cora« automation system handles logistics.

5

100% Checks of Manufactured Tools
Manufactured tools can either be checked on a random basis using a »genius« machine, or in complete batches through a fully automatic process with a »genius« machine in combination with the smart »roboSet 2« automaton solution.

6

Delivery with test report
Tools are delivered with a ZOLLER test report. This lets you guarantee your customers 100% precision for their manufactured, ground tools.

Fully Automated into the Future

Automation is the future – we are convinced of that. We use our passion and spirit of innovation to fully automate your tool production and grinding every day. From self-driving tool carts to tool preparation, which is handled by a collaborative robot, and fully automatic tool measurement, sorting, cleaning and labeling. We already offer you a large number of solutions for grinding your tools more efficiently using automated solutions.

Working for You 24/7 – »genius« with »roboSet 2«

»roboSet 2« loads and organizes tools fully automatically, around the clock, and can be combined with any measuring machine from the »genius« series. The measuring procedure starts up fully automatically after tools are loaded. All measurements are fully documented and can be associated with specific tools at any time. For 100 % checks and 100 % quality

But automatic measurement is not all. The robot in the preparatory tool cleaning »roboClean« grips the shank tool and places it into the ultrasound bath. There, it is cleaned before being clamped and measured in the »genius«.

Tools are marked using »roboMark«. A laser labels the shank of the tool in seconds with full flexibility, including customized data and even measured values or other data calculated during the measuring process itself.

Maintain an Overview: The Grinding Wheel Management Package

With the grinding wheel management package, you can measure and manage grinding wheels in a systematic, economical way.

Select the grinding wheels from the extensive grinding wheel library, and the measuring procedure starts automatically. You benefit from simple, precise measurements fulfilling the FEPA standard – independent of the operator. External grinding wheel presetting allows the grinding machine to be more productive. No time is lost by touching off or probing the wheel pack. You can inspect a sell-able tool in the setup run when presetting your grinding wheels with a ZOLLER tool presetter. Unlike a machine-integrated probe, the external tool presetter can measure and automatically transfer the wheel corner radius.

Storage location management ensures you have a good overview of your grinding wheels: directly on the monitor in virtual 3D storage spaces, including inventory management for all components.

The ZOLLER software lists all available grinding wheels in a library. You can select your grinding wheel or assemble grinding wheel packages, even complex ones. »genius« measures these automatically based on saved measuring procedures.

Photo-realistic input dialog including documentation and logging: ZOLLER »genius« makes measuring grinding wheels simple and efficient. Transmit measured actual data quickly and efficiently to your grinding machine with just one click.

Individual components are displayed in the bill of materials on the monitor, making it easier to assemble the grinding wheel package. Storage location monitoring for grinding wheels makes it easier to control inventory and monitor products removed. You always have a good overview of your entire inventory.

Once data has been saved in the software, you will never have to search for it again: ZOLLER TMS software indicates what compartment and drawer your grinding wheel package is located in using a three-dimensional model of the »keeper« tool cabinet.

ZOLLER Service

Your goal is maximum efficiency for your production. Our goal is to support you with well-designed system solutions. We also offer comprehensive service. Whether through personal consultation on site or by developing perfectly tailored solutions for individual requirements – if you choose ZOLLER, you will not only receive excellent products, but also unique production know-how on your side.
And of course, competent contact partners to answer questions at any time – over the entire life cycle of your ZOLLER products.
Utilize ZOLLER know-how to optimize your production processes.

Alexander Zoller | Christoph Zoller

ZOLLER Solutions

With us, you get more than excellent products. You get individual system solutions connected with your tools. We combine hardware, software and services for you. Everything from a single source. Everything for your success.
We call it: ZOLLER Solutions.

Reliable, into the Future »fingerprint«

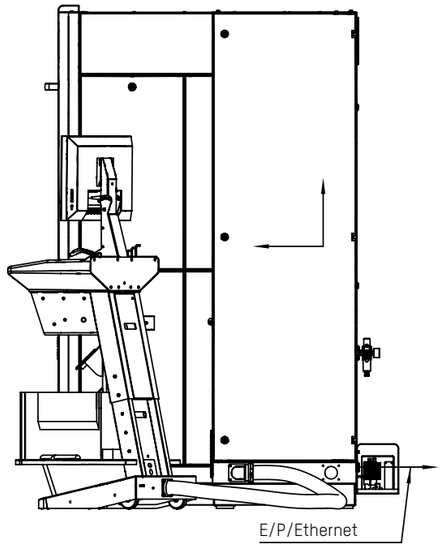
All of the control elements on a »genius« fulfill strict safety criteria! Device safety is TUV tested and certified. In addition, ZOLLER »genius« devices are continuously monitored by »fingerprint«. This inspection routine tests the measuring machine regularly for proper functionality. »genius« stands for secure work.

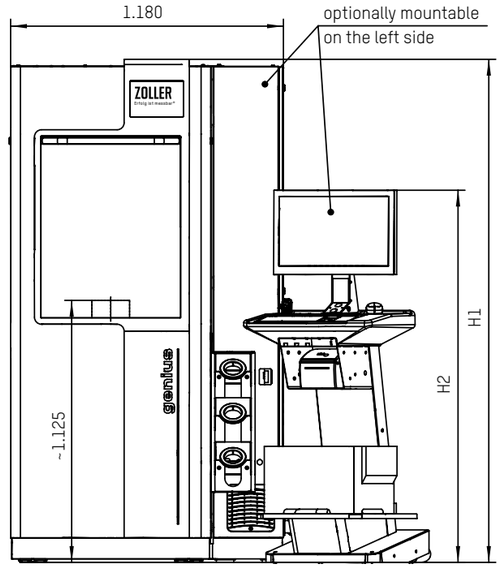
»fingerprint« – puts »genius« to the test

»fingerprint« is part of the »pilot« measuring machine software and completes a full system check of the »genius« measuring machine at regular intervals. »fingerprint« checks six functional levels: Machine controller, network, image processing, electronics, cameras and mechanics.

In addition, custom analysis options are available to identify possible changes in overall device performance over the service life, and indicate maintenance intervals.

Technical Data

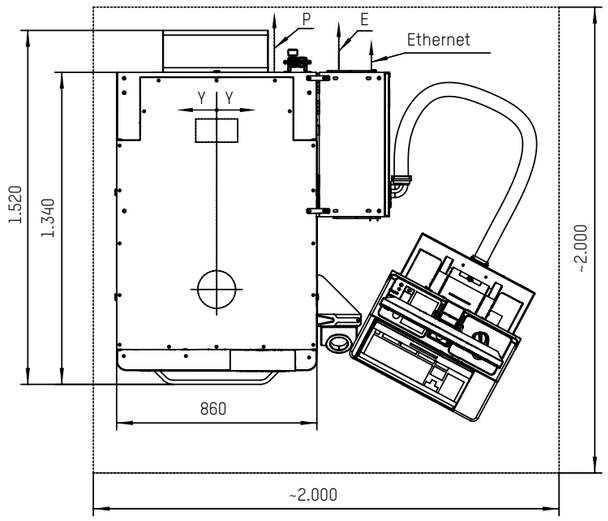




Pneumatic Connection Values:
DIN ISO 8573-1 class 3
min. 6 bar – max. 8 bar

Electrical connection values:
100-120/200-240V~ L+N+PE (*)
50/60 Hz
connection power 600 VA
mains cable line 2.50 m

Minimum door height for transportation:
2180 mm



***Note:** P air connection E electronic connection

Dimensions

»genius« Universal Measuring Machine Series with »cockpit«			
H1 (mm)	**H2 (mm)**	**Weight (kg / pounds)**	**Weight »cockpit« (kg / pounds)**
~2,160	1,700 – ~2,160	~820 - ~1,400	~60

Comfort for All – The »cockpit« Operating Unit

For health-conscious and comfortable working, the control unit can be customized according to the needs of the operator: Position height, swivel and tilt angles can be flexibly adjusted.

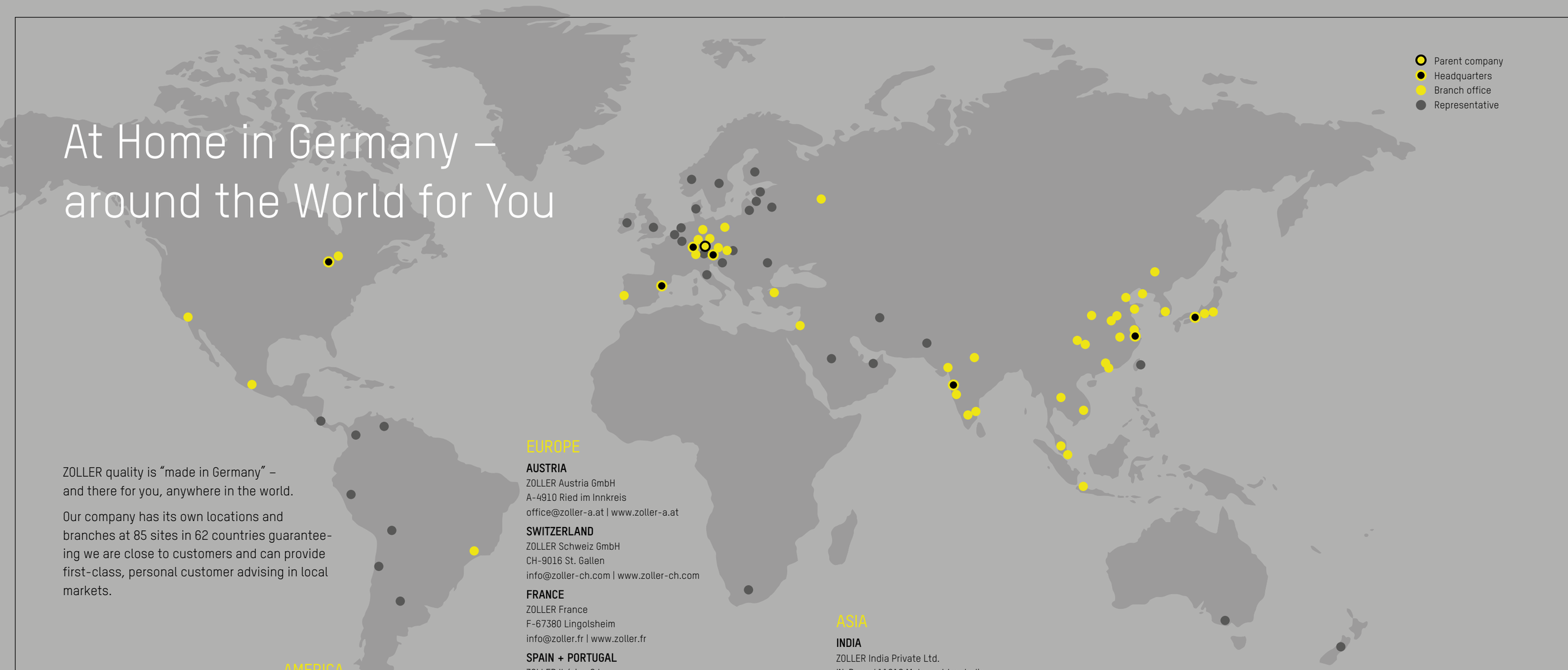
Tilt angle
-10° forward

+30° back

Fixed adjustable heights

DAkkS Deutsche Akkreditierungsstelle

At Home in Germany – around the World for You



ZOLLER quality is "made in Germany" – and there for you, anywhere in the world.

Our company has its own locations and branches at 85 sites in 62 countries guaranteeing we are close to customers and can provide first-class, personal customer advising in local markets.

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ZOLLER Solutions

More speed, higher quality, safer processes –
with ZOLLER you can get more out of your production.
We combine hardware, software and service to give you
optimum system solutions for presetting, measuring,
inspection and managing cutting tools.

- Presetting & Measuring
- Tool Management
- Inspection & Measuring
- Automation

Everything from a Single Source.
Everything for Your Success.
Everything with ZOLLER solutions.

ZOLLER
expect great measures

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