

# HELICHECK NANO

FOR THE MICRO AND NANO RANGES



# HELICHECK NANO

## APPLICATION

- Fully automatic and comprehensive measurement of tools in the micro and nano ranges
- Targeted feedback provided by measurement results

## MACHINE

- Low-vibration, solid granite base for maximum measuring accuracy
- 8-axis CNC machine with 3 cameras
- Certified accuracy  $E_{UX,MPE} = (1.2 + L/300) \mu\text{m}$  in standard
- Repeatability  $\leq 1.0 \mu\text{m}$
- Use in production process or measuring area
- Numerous options

## SOFTWARE

- WALTER measuring technology software "Quick Check Modular QCM"
- "Easy Check" for automatic profile detection
- "Teach-in Mode" for freely programmable measuring
- Numerous further options for increasing efficiency

« This fully automatic CNC measuring machine for the standard, micro and nano ranges is ideal for comprehensive measurements in transmitted light as well as in incident light for the smallest tools from a diameter of 0.1 mm. However, the focus of this measuring machine is specifically on the nano and micro tool range, which, for the first time, makes it possible to measure these kinds of small tools in every parameter. In standard, the value  $E_{UX,MPE} = 1.2 + (L/300) \mu\text{m}$  guarantees highly accurate measurement results »

BERND SCHWENNIG, STRATEGIC PRODUCT MANAGER MEASURING TECHNOLOGY

## YOUR BENEFIT

For fully automatic complete measurements of complex geometries, the CNC measuring machine HELICHECK NANO in the micro and nano ranges is the ideal solution. Microscopic sensor technology allows even the smallest geometries to be detected and evaluated with process reliability. In the range up to a diameter of 16 mm, the HELICHECK NANO demonstrates its true power. Featuring certified accuracy, it sets standards in assuring productivity, quality and precision in modern tool production. In automated tool machining, it assumes the key function of 'quality control' in the process with integrated tolerance verification.



HELICHECK NANO with Robot loader (option)





FURTHER DETAILS

# WALTER MEASURING TECHNOLOGY: SUPERIOR TECHNOLOGY

## Reference $E_{UX,MPE}$ : Standard for accuracy

The  $E_{UX,MPE}$  value is the key machine-specific characteristic value for evaluating a measuring machine. It defines the one-dimensional axially parallel length deviation in coordinate measurement systems. The lower the  $E_{UX,MPE}$  value, the smaller the range of the permissible measurement deviation and the greater the accuracy to the actual value of the measurement result. Please note: The value of the permissible uncertainty of measurement alone does not provide a reliable indication of the performance of a measuring machine (but it is an important basic prerequisite). Repeatability must also be considered in this context.

For the HELICHECK NANO, the permissible range of the measuring deviation is  $E_{UX,MPE} = (1.2 + L/300) \mu\text{m}$  and enables process-reliable quality assurance even for production tolerances  $\leq 10 \mu\text{m}$  e.g.  $\pm 5 \mu\text{m}$ . The lower the  $E_{UX,MPE}$  value, the more accurate the measurement result.

The repeatability of the HELICHECK NANO is also impressive and powerful with  $\leq 1 \mu\text{m}$ .

## Measuring system capability

The measurement system capability is of great importance when assessing whether a measurement system is able to map and validate processes with the required accuracy.  $C_g/C_{gk}$  values  $> 1.33$  are an absolute 'must' here. In order to provide proof of the measuring system capability, each HELICHECK measuring machine is subjected to extensive acceptance measurements within the scope of the machine acceptance and its measuring system capability is documented. The acceptance measurements are carried out using DAkkS-certified gauges, and the characteristics correspond to the measurement objects or tools to be measured in the future. The following gauges are used for this purpose: step plug gauges for length and diameter measurements, angle gauges for clearance and rake angle measurements as well as corresponding contour gauges. The fundamentals behind the measuring system capability of the HELICHECK measuring machines are the solid machine base made of granite as well as the minimal travel of the sensors in use.

Tool examples:

various drills, milling tools, threading tools, reamers



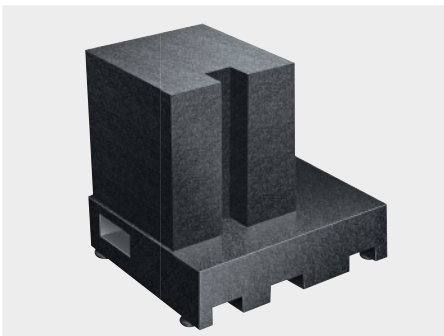






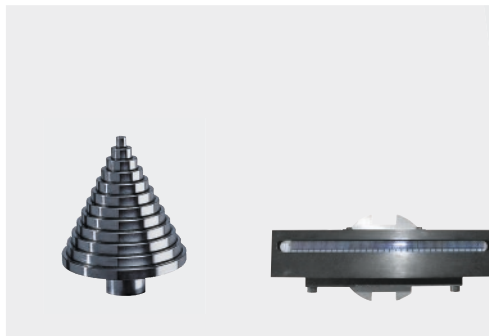
# INNOVATIVE WALTER MEASUREMENT TECHNOLOGY

The HELICHECK NANO uses a high-resolution camera with a microscopic sensor and variable lens selection. The solid granite block and minimal sensor travel are the fundamentals behind the maximum stability and, as a result, maximum precise measuring and repeatability. The permanently installed cameras are safely protected from dust and extraneous light in the fully covered measuring area. Segmented LED light sources for all cameras create the ideal conditions for maximum accuracy. No compromises were made in the control unit and the complete axis system. The linear axes of the measuring machines are equipped with glass measuring rods in order to ensure the highest possible positioning accuracy. This results in very short positioning times and a positioning resolution of 0.004  $\mu\text{m}$ .



## Solid granite base

The high mass of the solid granite base forms the basis for accuracy and precision. It works to absorb vibration and is thermostable. These are the requirements for maximum measuring accuracy and reliable measuring results.



## Certified accuracy

According to VDI/VDE 2617, the accuracy of a measuring machine is evaluated by various measurements at various clearances on certified measurement standards. For this purpose, WALTER uses DAkkS-certified standards such as step plug gauges and angle gauges. The standard calls for at least three measurements. WALTER performs these measurements ten times each. The high accuracy of the gauges is certified with the calibration certificates from the Physikalisch-Technische Bundesanstalt (Germany's national metrology institute).



## Vibration compensation

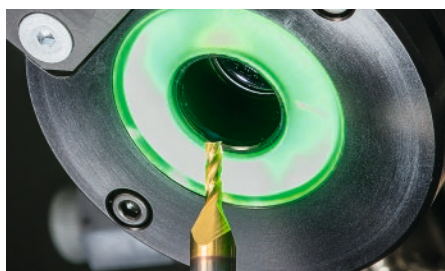
To eliminate vibrations caused by external influences, the HELICHECK NANO is equipped with vibration-insulating air-spring feet as standard.



Horizontal "0 degree" alignment of the camera

## INCIDENT LIGHT MICROSCOPE

5-fold automatic microscope turret for the incident light measuring range of diameters 0.1 mm to 16 mm and length measuring range up to 120 mm.



Stepless "0-90 degree" alignment of the camera

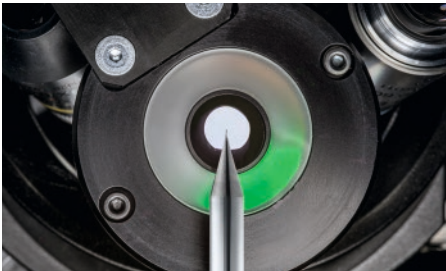


Vertical "90 degree" alignment of the camera

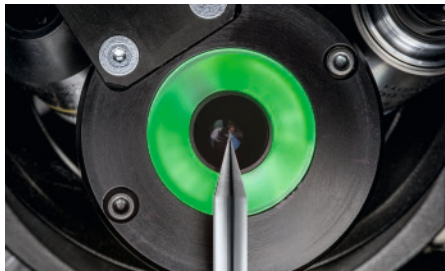
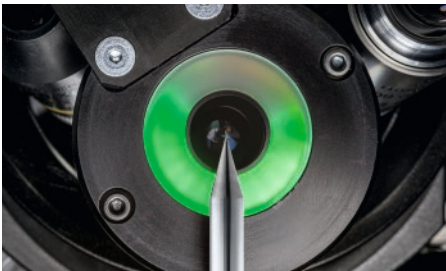
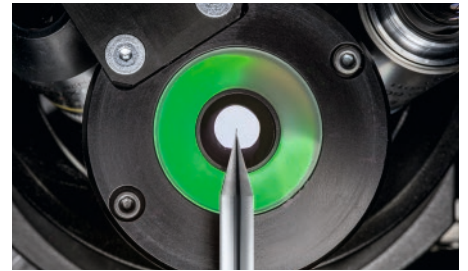
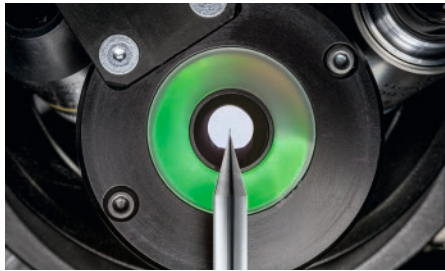
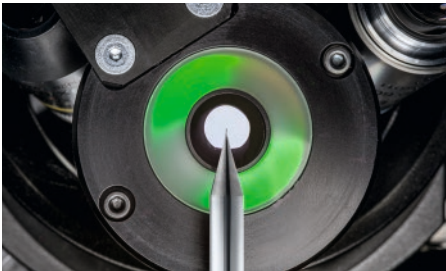


# LIGHTING SITUATIONS

Optimum illumination of the tool surface with 28 lighting options.



- Optimum lighting of the tool surface through segmented diffuser lighting and additional coaxial lighting (each can be controlled individually) for a high-contrast surface display



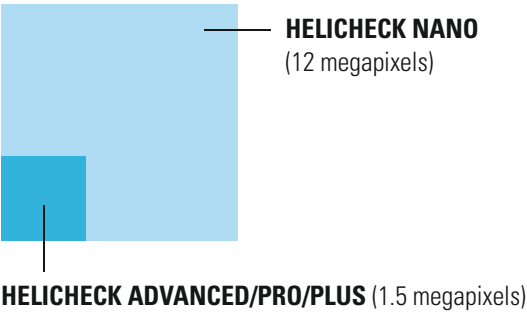
# MACHINE COMPARISON



	HELICHECK ADVANCED	HELICHECK PRO
Magnification, transmitted light	50 x	50 x
Magnification, incident light	100 x	200 x
Camera resolution	1.5 megapixels	1.5 megapixels
Measuring range, transmitted light measurements	Ø 1 – 320 mm	Ø 1 – 200 mm
Measuring range, incident light measurements	Ø 3 – 70/320* mm	Ø 3 – 70/200* mm

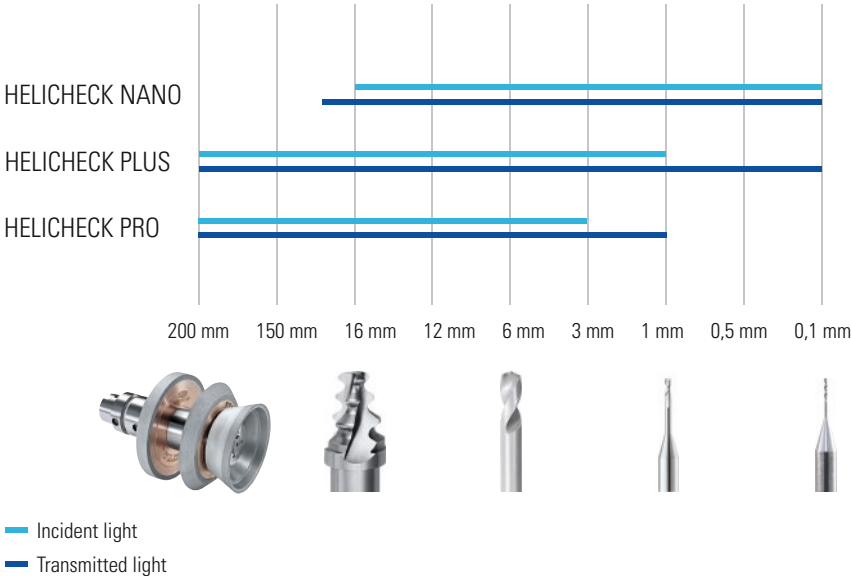
\*depending on parameters

## RESOLUTION



- 7 optical detection systems**
- 2 x transmitted light with 50x and 400x magnification
  - 5 x incident light with magnification lens (resolution 12 megapixels)

## AREAS OF APPLICATION







## HELICHECK PLUS

50/400x

400x

1.5 megapixels

Ø 0.1 – 200 mm

Ø 1 – 60/200\* mm

## HELICHECK NANO

50/400x

5/10/20/50/80/800x

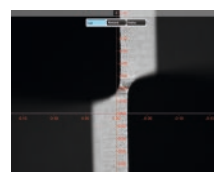
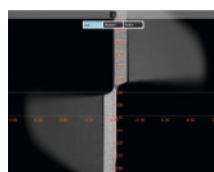
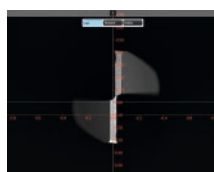
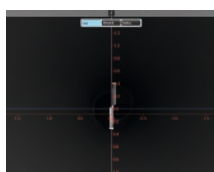
12 megapixels

Ø 0.1 – 60 mm

Ø 0.1 – 16 mm

## OPTICAL MAGNIFICATION

HELICHECK NANO	5x	10x	20x	50x	50x „R“
Image window	3.38 x 3.38 mm	1.69 x 1.69 mm	0.84 x 0.84 mm	0.34 x 0.34 mm	0.34 x 0.34 mm
Pixel size	1.1 µm	0.55 µm	0.25 µm	0.11 µm	0.11 µm
Pixel number	9,450,000	9,450,000	9,450,000	9,450,000	9,450,000
Working distance	23.5 mm	17.5 mm	19.0 mm	22.0 mm	11.0 mm



## QUICK ASSISTANT – INCREDIBLY EASY TO USE



- Measurement in only two steps
- Simple, graphical user interface
- For cylindrical and conical milling cutters and drills
- No input of target parameters required
- Automatic logging of measured values

### Example icons of the tool family "Cylindrical end mills"

Operating WALTER measuring machines has never been easier. The clearly arranged icons allow the software to be used easily. Previous knowledge is not required.



Sharp-edged



Chamfer



Corner radius



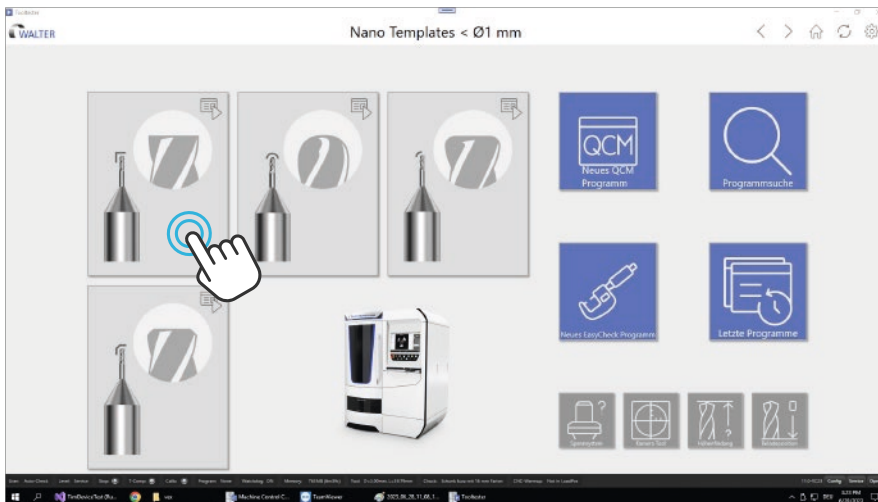
Ball nose radius



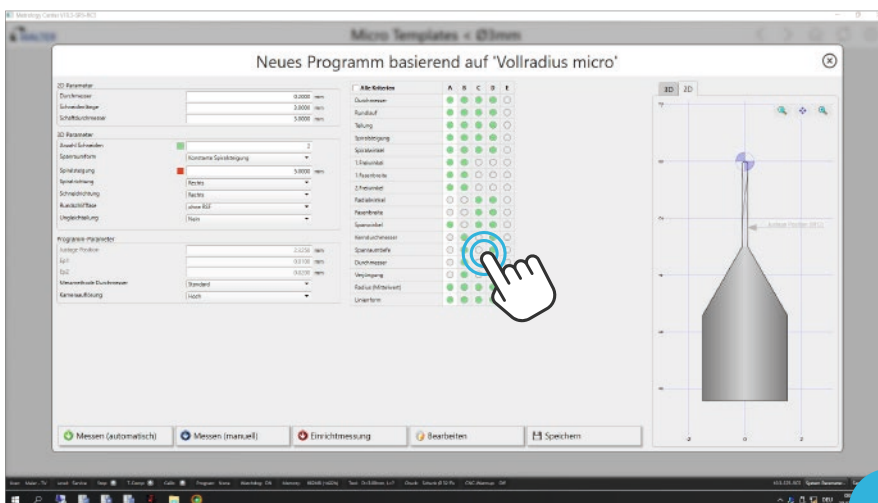
Drill



# WALTER MEASURING TECHNOLOGY SOFTWARE: QUICK ASSISTANT – TARGET REACHED IN ONLY TWO STEPS



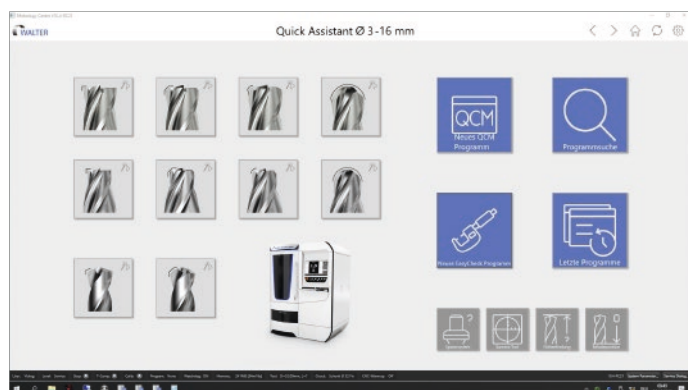
**Step 1**  
Select tool family.



**Step 2**  
Select test plan and start designing and measuring by clicking measurement/new test plan.



## QUICK-CHECK FOR TOOLS IN THE STANDARD RANGE



### Logging data

Comprehensive data logging for all measured parameters including tolerance evaluation and graphical display. Measurement results and protocols are available in hard copy as well as in file form for further electronic processing in various applications.

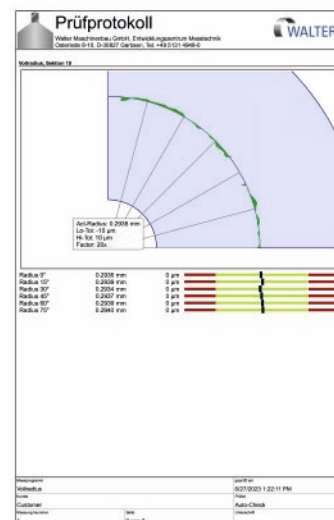
**Prüfprotokoll**

Walter Messtechnik GmbH, Entwicklungszentrum Messtechnik  
Chiemweg 6-10, D-83607 Garmisch, Tel. +49 (0)171 4948 0

Diagramm: Bild 1

Meßposition	Actual	Normal	HTol	LTol	QW	Status
Durchmesser	0.0028 mm	0.0000 mm	0.0000 mm	-0.0100 mm	0.0000 mm	OK
Durchmesser (0.001 mm)	10.00°	0.00°	1.00°	1.00°	0.00°	OK
Radius (Mittelwert)	0.0008 mm	0.0000 mm	0.0100 mm	-0.0100 mm	-0.0000 mm	OK
Leertiefe	0.0008 mm	0.0000 mm	0.0000 mm	-0.0000 mm	0.0000 mm	OK
1. Flankendicke	0.0008 mm	0.0000 mm	0.0100 mm	-0.0100 mm	0.0000 mm	OK
2. Flankendicke	0.0008 mm	0.0000 mm	0.0100 mm	-0.0100 mm	0.0000 mm	OK
3. Flankendicke	0.0008 mm	0.0000 mm	0.0100 mm	-0.0100 mm	0.0000 mm	OK

Meßsystem: g001000 1.00.11 PM2  
Validiert: g001000 1.00.11 PM2  
Prüf: AutoCheck  
Customer: Wal  
Messwert: 1 von 2



## INTERFACES TO EXTERNAL SYSTEMS



### The interfaces

Comprehensive interface concepts for connecting measuring machines to the production environment. This ranges from simple data interfaces for importing target data and tolerance limits to completely parameterised measurement sequence generation from higher-level production control systems. Likewise, the actual data measured can be processed across systems for quality assurance and documentation purposes.

### Interfaces to external systems for

- Measurement sequence generation
- Parametric measurement sequence generation
- Documentation purposes



## WE ARE HERE FOR YOU!

Our products are designed to meet customer demands for as long as possible, they are intended to operate efficiently, reliably, and be available at any time.

From “Start up” through to “Retrofit” – our Customer Care is there for you throughout the working life of your machine. For this reason, you can rely on competent HelpLines worldwide and Service Engineers near you:

- We will provide you with fast, straight-forward support.
- We will help to increase your productivity.
- We work professionally, reliably and transparently.
- We will provide a professional solution to your problems.



### Start up

Commissioning  
Extension of the guarantee



### Qualification

Training  
Product support



### Prevention

Maintenance  
Inspection



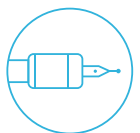
### Service

Customer service  
Customer advice  
Helpline



### Digital Solutions

Remote Service  
Service Monitor  
Production Monitor



### Material

Spare parts  
Replacement parts  
Accessories



### Rebuild

Machine overhauling  
Refurbishing of assemblies



### Retrofit

Conversions  
Retrofitting parts

## UNITED GRINDING DIGITAL SOLUTIONS™

We develop solutions to support you in simplifying processes, boosting your machines' efficiency and increasing overall productivity under the “UNITED GRINDING Digital Solutions™” brand. Find out more about

UNITED GRINDING Digital Solutions™ services on our website in the Customer Care section.

## CUSTOMER CARE



# TECHNICAL DATA, DIMENSIONS

## AXES

X-axis	270 mm
Y-axis	365 mm
Z-axis	250 mm
A-axis	360°

## ACCURACY

Measurement uncertainty	$E_{U,MPE} = (1,2 + L/300) \mu m$
Diameter measurement/length measurement	
Repetition accuracy	$\leq 1 \mu m$
Positioning resolution for all linear axes X, Y, Z	0.004 $\mu m$
Position resolution for rotation axis A	$< 0.00036^\circ$
Measurement value resolution	0.25 $\mu m$

## MAGNIFICATION<sup>1)</sup>

### HELICHECK NANO

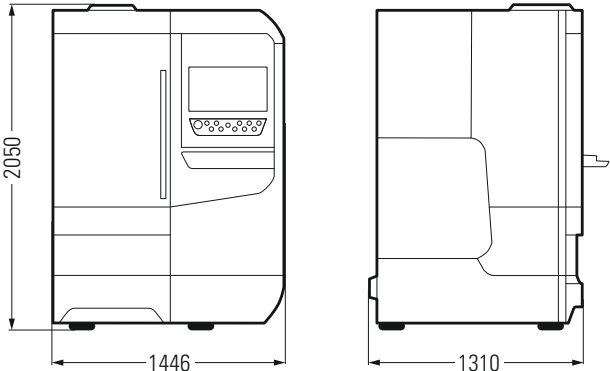
Transmitted light camera	50/400 x
Incident light microscope	up to 800 x

## OTHERS

<b>CONNECTED LOAD</b>	
Power consumption at 230 V/50 Hz	approx. 2 kVA
<b>WEIGHT</b>	
HELICHECK NANO	Approx. 2,500 kg

## TOOL DATA

Max. tool diameter, transmitted light	60 mm
Max. tool diameter, incident light microscope	16 mm
Max. tool length, transmitted light	365 mm
Max. tool length, incident light microscope, end face	120 mm
Max. tool length, incident light microscope, circumference	235 mm



### HELICHECK NANO

Dimensions in mm. Options, accessories or open doors can increase the dimensions of the machine. Subject to modifications due to technical progress and errors. No guarantee is provided for this information.

<sup>1)</sup>The magnifications are relative to a 19" screen.

# CREATING TOOL PERFORMANCE

We are a global leader among market-oriented technology and service companies, and a system and solution partner for all areas of tool machining. Our range of services is the basis for innovative machining solutions for practically all tool types and materials typical for the market with a high degree of added value in terms of quality, precision, durability and productivity.



## GRINDING

Grinding of rotation-symmetrical tools and workpieces, as well as indexable inserts

Machines	Use   Materials	Tool dimensions <sup>1)</sup> max. length <sup>2)</sup> / diameter
HELITRONIC G 200	P R HSS TC C/C	235 mm / Ø 1 – 125 mm
HELITRONIC MINI PLUS	P R HSS TC C/C CBN	255 mm / Ø 1 – 100 mm
HELITRONIC RAPTOR	P R HSS TC C/C CBN	280 mm / Ø 3 – 320 mm
HELITRONIC POWER 400	P R HSS TC C/C CBN	520 mm / Ø 3 – 315 mm
HELITRONIC VISION 400 L	P R HSS TC C/C CBN	420 mm / Ø 3 – 315 mm
HELITRONIC MICRO	P R HSS TC C/C CBN R HSS TC C/C CBN	220 mm / Ø 0.1 – 12.7 mm 220 mm / Ø 3 – 12.7 mm

Machines	Use   Materials	Indexable insert <sup>1)</sup> Inscribed circle/ circumscribed circle
COMPACT LINE	P R HSS TC C/C CBN PCD	Ø 3 mm / Ø 50 mm



## LASER

Laser machining of indexable inserts and/or rotation-symmetrical tools

Machines	Use   Materials	Tool dimensions <sup>1)</sup> max. length <sup>2)</sup> / diameter
LASER LINE ULTRA	P R TC C/C CBN PCD CVD-D MCD/ND	250 mm / Ø 0.1 – 200 mm
LASER LINE PRECISION	P R CBN PCD CVD-D MCD/ND	250 mm / Ø 0.1 – 200 mm
Machines	Use   Materials	Indexable insert <sup>1)</sup> Inscribed circle/ circumscribed circle
LASER LINE ULTRA	P R TC C/C CBN PCD CVD-D MCD/ND	Ø 3 mm / Ø 50 mm
LASER LINE PRECISION	P R CBN PCD CVD-D MCD/ND	Ø 3 mm / Ø 50 mm



## EROSION

Eroding and grinding of rotation-symmetrical tools

Machines	Use   Materials	Tool dimensions <sup>1)</sup> max. length <sup>2)</sup> / diameter
HELITRONIC DIAMOND EVOLUTION	P R HSS TC C/C CBN PCD	185/255 mm / Ø 1 – 165 mm
HELITRONIC RAPTOR DIAMOND	P R HSS TC C/C CBN PCD	270 mm / Ø 3 – 400 mm
HELITRONIC POWER DIAMOND 400	P R HSS TC C/C CBN PCD	520 mm / Ø 3 – 380 mm
HELITRONIC VISION DIAMOND 400 L	P R HSS TC C/C CBN PCD	420 mm / Ø 3 – 315 mm



## MEASURING

Contact-free measurement of tools, workpieces and grinding wheels

Machines	Use   E <sub>UX</sub> /MPE-value	Tool dimensions <sup>1)</sup> max. length <sup>2)</sup> / diameter
HELICHECK ADVANCED	M (1.8 + L/300) µm	420 mm / Ø 1 – 320 mm
HELICHECK PRO	M (1.2 resp. 1.4 + L/300) µm	300 mm / Ø 1 – 200 mm
HELICHECK PRO LONG	M (1.2 resp. 1.4 + L/300) µm	730 mm / Ø 1 – 200 mm
HELICHECK PLUS	M (1.2 resp. 1.4 + L/300) µm	300 mm / Ø 0.1 – 200 mm
HELICHECK PLUS LONG	M (1.2 resp. 1.4 + L/300) µm	730 mm / Ø 0.1 – 200 mm
HELICHECK NANO	M (1.2 + L/300) µm	120 mm / Ø 0.1 – 16 mm
HELICHECK 3D	M (1.8 + L/300) µm	420 mm / Ø 3 – 80 mm



## SOFTWARE

The intelligence of tool machining and measuring for production and regrinding



## CUSTOMER CARE

Comprehensive range of services

<sup>1)</sup> The maximum tool dimensions depend on the type of tool and its geometry, as well as the type of machining.

<sup>2)</sup> From theoretical taper diameter of the workpiece holder.

Use: P Production R Regrinding M Measuring

Materials: HSS High speed steel TC Tungsten carbide C/C Cermet/ceramics CBN Cubic boron nitride PCD Polycrystalline diamond

CVD-D Chemical vapour deposition MCD/ND Monocrystalline diamond/natural diamond



## WALTER MASCHINENBAU GMBH

WALTER has produced tool grinding machines since 1953. Today, our product range is supplemented by tool eroding machines and fully automated CNC measuring machines of the HELICHECK series for contactless complete measurement of tools and production parts.

Walter Maschinenbau GmbH is a company of the UNITED GRINDING Group. Together with EWAG, we consider ourselves to be a supplier of systems and solutions for the complete machining of tools and can offer a wide range of products, including grinding, eroding, laser machining, measurement and software.

Our customer focus and our global sales and service network of company-owned locations and employees has been appreciated by our customers for decades.



Grinding



Eroding



Laser



Measuring



Software



Customer Care

## ABOUT US

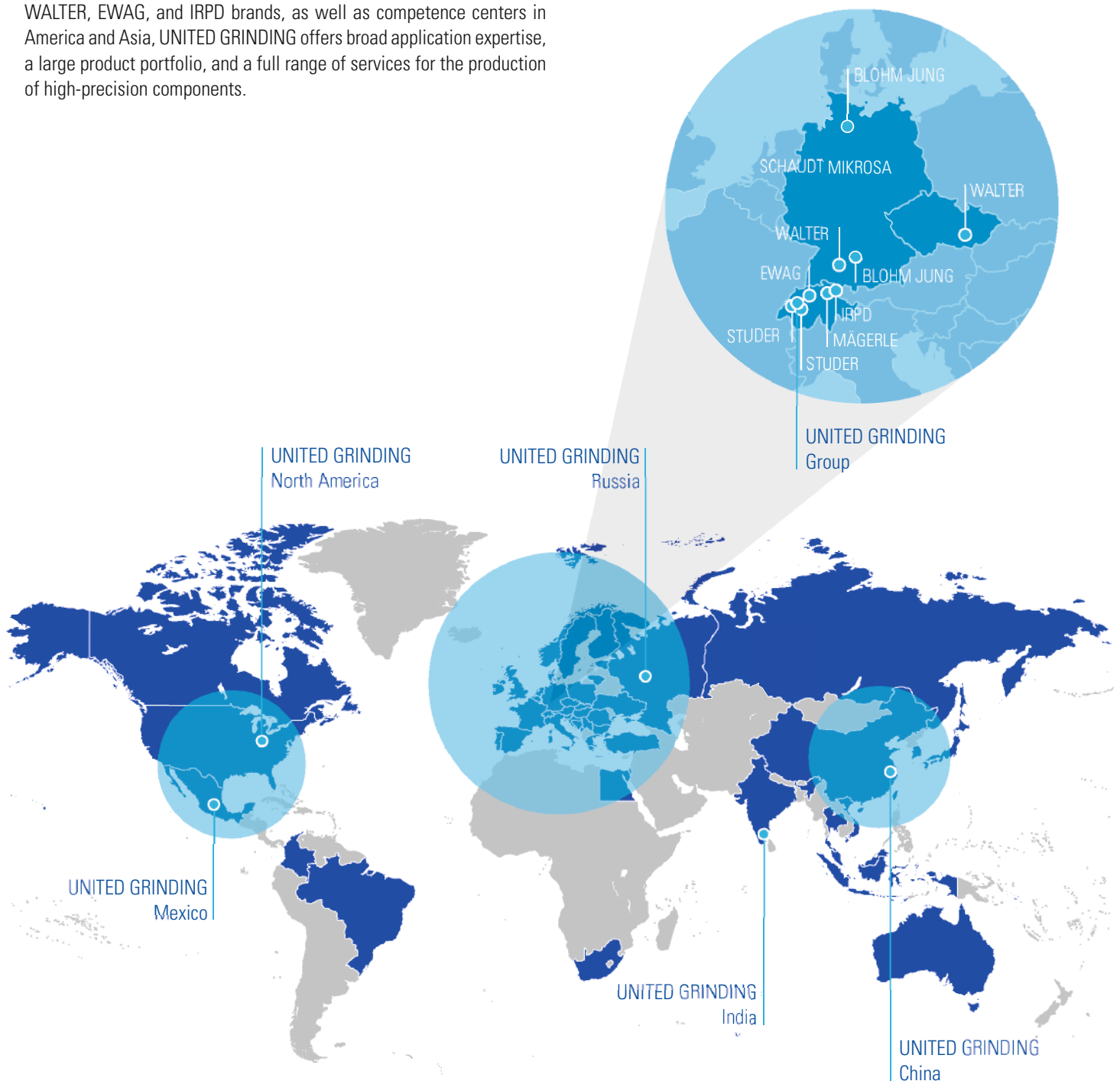


# UNITED GRINDING GROUP

UNITED GRINDING Group is one of the world's leading manufacturers of grinding, eroding, laser, and measuring machines as well as machine tools for additive manufacturing. With roughly 2,500 employees at more than 20 manufacturing, service, and sales locations, the Group is organized in a customer-oriented and efficient way.

Through its MÄGERLE, BLOHM, JUNG, STUDER, SCHAUDT, MIKROSA, WALTER, EWAG, and IRPD brands, as well as competence centers in America and Asia, UNITED GRINDING offers broad application expertise, a large product portfolio, and a full range of services for the production of high-precision components.

« We want to make our customers even more successful »





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