WINWERTH®

THE 3D MEASUREMENT SOFTWARE FOR ALL TASKS ON THE SHOPFLOOR AND IN THE LABORATORY
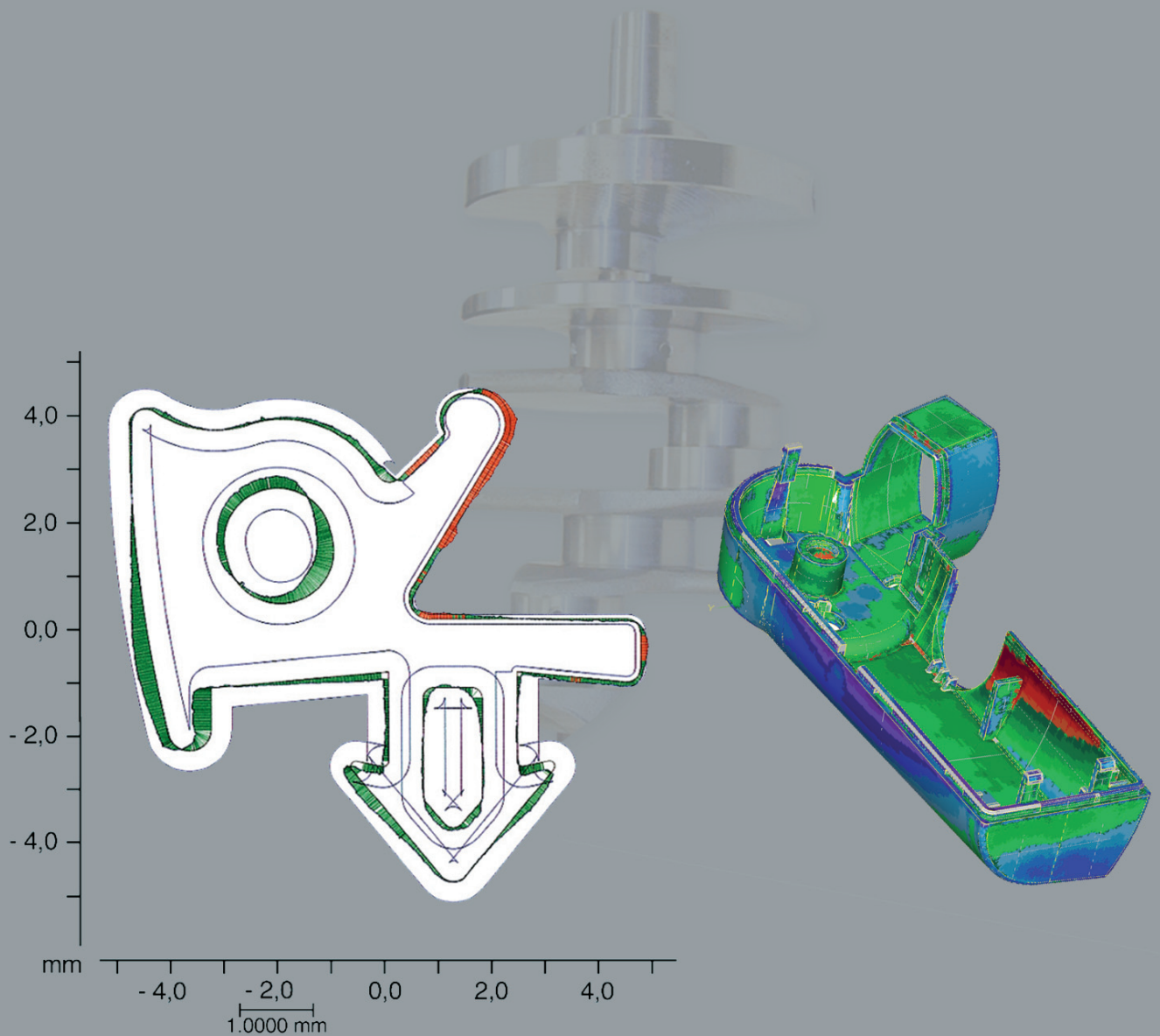
WinWerth® Version 8.41

Dear customers,

We are pleased to present the new Version 8.41 of our WinWerth® 3D measurement software.

WinWerth® Version 8.41 continues the trend of completely capturing ever more complex workpiece geometries, using integrated methods to rapidly measure large numbers of points. Many new functions for conveniently programming and editing measurement programs have been integrated.

The recently launched Chromatic Focus Line (CFL) is a fast, highly accurate sensor for capturing surface topographies in three dimensions. The line sensor uses around 200 measurement points to capture workpiece surfaces according to the chromatic focus principle. The result of a scan is both a 3D point cloud and a two-dimensional raster image for analysis.

This year in the field of computed tomography we present new 2D functions to support X-ray inspection tasks, and the newly developed OnTheFly technology for completely and precisely capturing workpieces in a very short time.

For an update or upgrade, please contact our sales team by phone at +49-641-7938-519, send an email to export@werth.de or contact your local dealer.
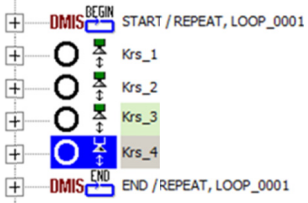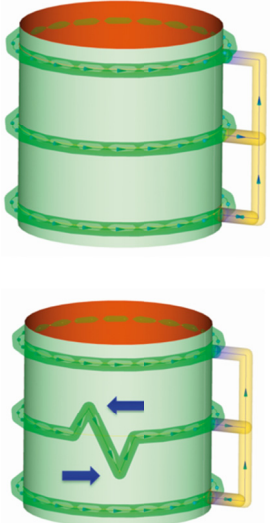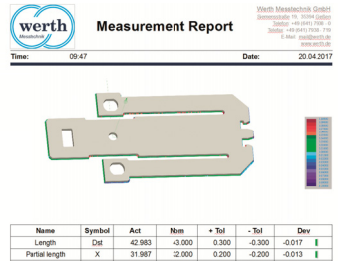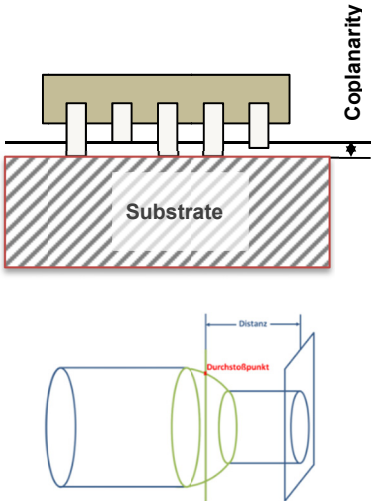
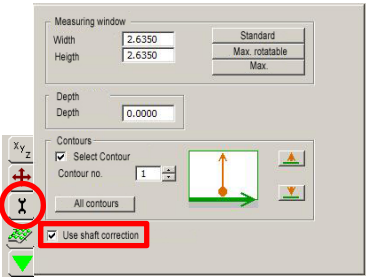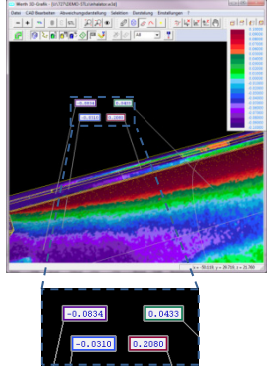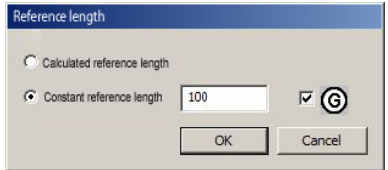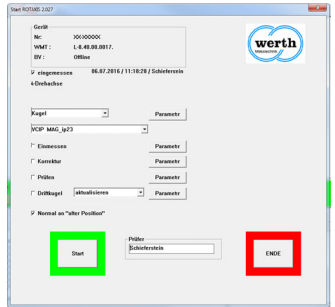We wish you continued success in your work with WinWerth®.
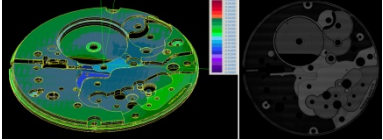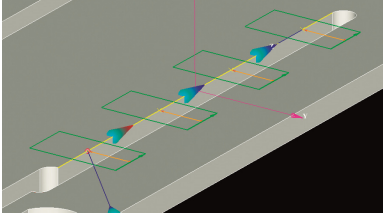
Best regards from Giessen,

Your team at Werth Messtechnik GmbH

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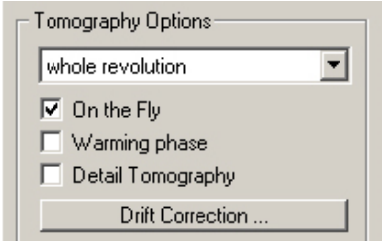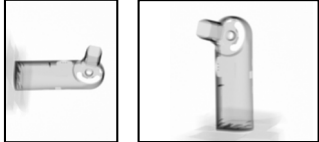| WinWerth® General Functions (Standard)	**TeachEdit mode** Various functions for editing and testing measurement programs are integrated in WinWerth®. Parameter programs can be used to measure different types of workpieces automatically after entering only a few parameters. Target elements to be linked can be created from offline measurements of individual elements, or parts of subroutines and loops. • These and other test functions are also available for parameter programs that contain DMIS commands such as JUMPTO, IF / THEN / ELSE, ONERROR, TEXT / INI, TEXT / READ, SYSTEM / TRANSPARENT, SYSTEM / EXECUTE and variables in all commands. • Mirroring of measurement sequences is now easily possible. • Significant increases in speed are obtained with offline processing of measurement sequences, especially when using large CAD models. • Speed control of the offline processing is done via "Tacho" function.	 *Even loops can be easily edited and tested*
WinWerth® General Functions (Standard)	**Easily Modify Scan Paths** The automatic scan path and point distribution is available with the strategies of helix, raster, or surface line for different geometric elements. During interactive measurement, scan paths or measurement points can be moved, deleted, or added in the 3D graphics window by means of the mouse or with a dialogue box. • These editing options, including adjustment of the measurement strategy and light or sensor settings, are available from a properties dialogue even after the scan path has been taught. • All necessary measurements, including analysis, can be programmed using the CAD model. The scan path and point distributions can then be adjusted and tested individually either offline or online. • If there is no CAD model, then the entire measurement sequence will be completed with the minimum number of points required for the geometric element. It can then be adjusted afterwards. • The same editing options are available for measurement programs using elements generated from n points, e.g. from earlier WinWerth® versions.	 *Scan path layout before (top) and after adding additional points (bottom)*

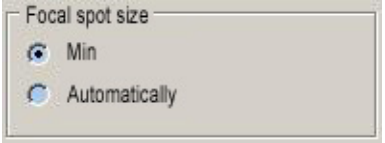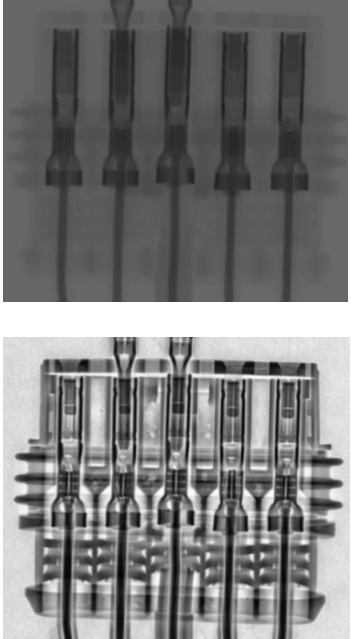| WinWerth®	Office Report in TeachEdit Mode	
General Functions (Standard)	Tables of measured values, 2D and 3D graphics, BestFit and ToleranceFit® plots, camera images, or any other images can be documented in the office report. - Output options for the office report - Screen display - Automatic printing - Automatic PDF conversion - The measurement report can be created after the measurement program has run or at any time during interactive measurement. - ODT and PDF files can be optionally signed in order to guarantee authenticity and prevent changes by third parties.	*Office report with BestFit plot and measured values*
WinWerth® General Functions (Standard) (Option) (Standard)	**Calculation Elements** A large variety of calculation possibilities allows the determination of all desired dimensions with WinWerth®. ***Two-point dimension*** - As a supplement to the envelope principle for analyzing circles and cylinders, the two-point dimension according to DIN EN ISO 14405-1 has been added. - For minimum circumscribed circles, the smallest two-point diameter is output; for maximum inscribed circles, it is the largest two-point diameter. ***Coplanarity*** - A calculation strategy for determing coplanarity has been supplemented. - A typical application example is measuring the height of IC pins (coplanarity is the distance from the lowest pin to the plane passing through the three highest pins). - The measurement can be performed using autofocus points or the Chromatic Focus Line sensor and a plane is calculated from the extreme points. ***Penetration point of a line through a torus*** - Calculation of the point of penetration of a line through a torus has been added. - The penetration point is used to obtain the position of a prescribed diameter on the torus. From this position, for example, the distance from a plane can be calculated.	*Penetration point of a torus and line for calculating a distance*
WinWerth® General Functions (Option)	**CAD import** 3D CAD models can be imported into WinWerth® in various formats. For example, with the NX format colored patches can be imported. Many companies use these colors for tolerance visualization in interactive measurements or programming.	

WinWerth® General Functions (Option)	**Shaft Correction** Systematic measurement deviations caused by optical properties are corrected automatically. • The new version of the shaft correction option makes it possible to correct all IP measurement elements including freeform contours (mainly for cones and cylinders).	 *Shaft correction*
WinWerth® General Functions (Standard)	**Color-Coded Deviation Analysis in the 3D Graphic** When moving the mouse across a color-coded deviation plot, a "Quick info" label appears, showing the local deviation at the current mouse position. • The border of the deviation label is now also shown in the corresponding color of the deviation (the same as the model color code).	 *Color-coded deviation label*
WinWerth® General Functions (Standard)	**Reference Length for Location Deviations** Some location deviations require a reference length. So far, the reference length has been automatically taken from the measurement points. • Now a fixed reference length can be entered.	 *Reference length dialog*
WinWerth® General Functions (Standard)	**Analysis Tool** For example, when using the Werth hotline support, it may be useful to send system files and user programs via e-mail. • With a new tool, the relevant information is automatically stored and packed for easy sending.	
WinWerth® General Functions (Standard)	**Calibration Program for Rotary Axes** The rotary axis calibration program is a menu-driven, convenient calibration program for calibrating rotary and rotary/tilt axes. • The sub-routines for calibrating between centers, and for calibrating directly on the workpiece, are included in the standard scope of supply.	 *Calibration program starting screen*

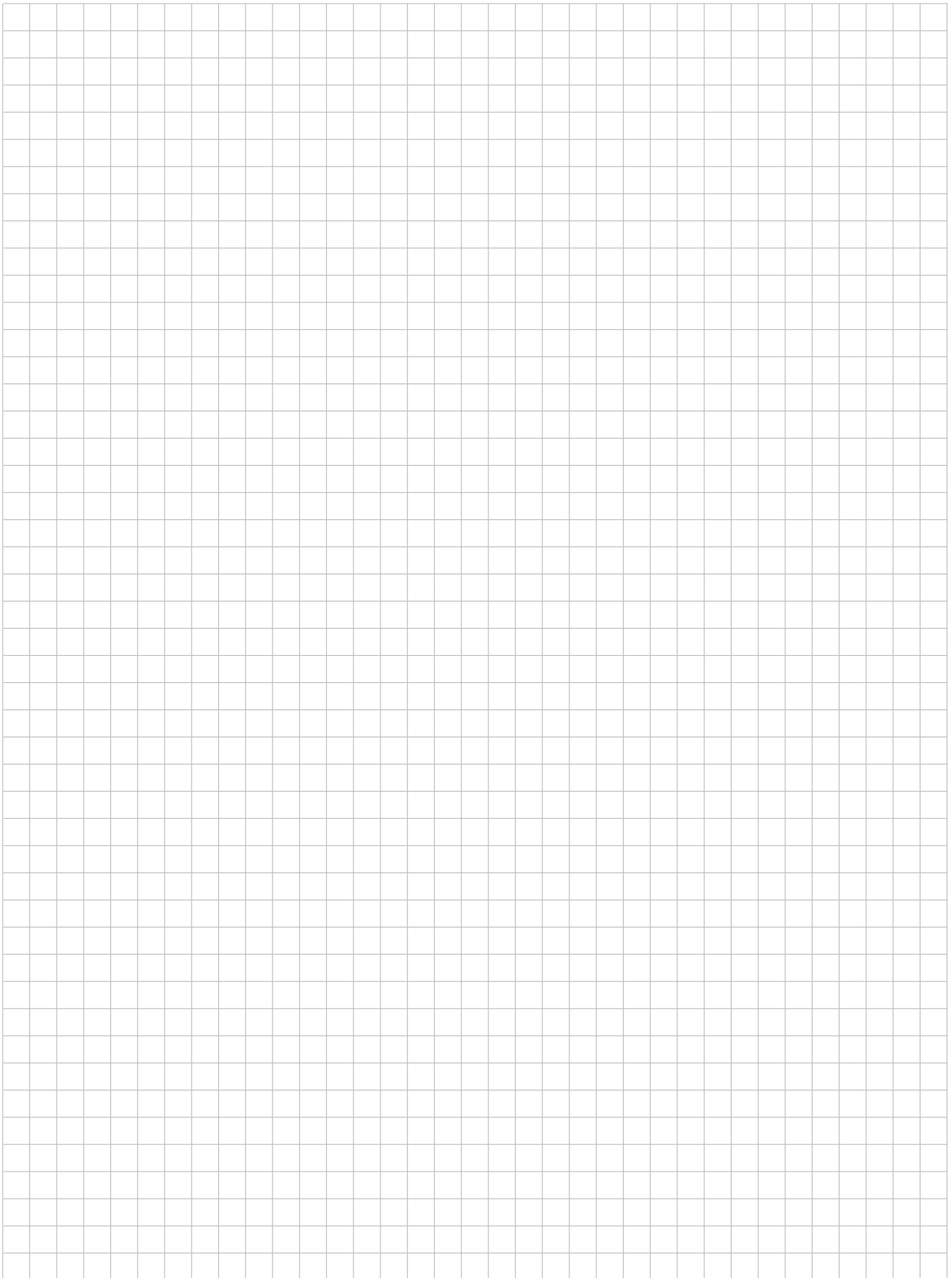|		
Optical Line Sensor (Option)	**Chromatic Focus Line (CFL)** As a leading company in coordinate metrology with optical sensors, multisensor systems and X-ray tomography, Werth has a comprehensive sensor range. - The CFL is a highly accurate optical line sensor. - Complete 3D measurement of surfaces at both high accuracy and high speed - About one million measurement points are measurend in three seconds. - Since the sensor is largely independent of the surface condition of the workpiece, diffuse, shiny, or transparent surfaces can be measured. - Easy "in the image" measurements of geometric features, a determination of the workpiece coordinate system, or the documentation is possible with the raster image. - The CFL can be used for capturing 3D topographies, for height measurement, for flatness and roughness measurement and for profile form comparison.	*Measurement of a watch plate using the CFL* *Color-coded deviation analysis between the point cloud measured by the Chromatic Focus Line sensor and the CAD model (left) and raster image of a watch plate (right) (© Nomos/Werth)*
WinWerth® Image Processing (Standard)	**Contour Selection in 3D CAD Offline® / Online®** Measurement programs can be created offline or online on the CAD model from single points, scan paths, and free-form scanning. Sensor parameters such as light settings, measurement strategies, and image processing filters can be selected and enable reliable incident light measurements using the image processing sensor. - Large measuring windows with contour selection are now also programmable offline and allow reliable measurements even on coarsely tolerated workpieces. - Using contour selection, the full functionality of IP is now supported online and offline.	*Starting from the base edge of the measurement window, the second contour is captured*
WinWerth® Image Processing (Standard)	**Brightness Adjustment** Software sliders can set the light level between 0 and 100 %. For many workpieces, good brightness can already be achieved at very small percentage values. An optimal brightness setting is difficult in the lower range. - The resolution for adjusting the brightness is finer in the lower brightness range. - This makes it possible to optimally adjust the required light even for very reflective workpieces.	

Computed Tomography (Option)	**OnTheFly CT (patent pending)**
	
	For computed tomography various special measuring methods exist, for example, Raster, ROI and Eccentric CT.
	
	• These procedures were extended by OnTheFly CT with a continuously rotating machine axis during the measurement.
	
	• The advantages of OnTheFly mode in comparison with start-stop mode:
	  - The measurement time can be reduced by up to ten times for the same quality of data.
	  - The data quality is increased for the same measurement time.
	  - A shorter measurement time is reached even when using raster or ROI tomography or higher detector resolution.
	  - Enables production monitoring with CT
	
	• The OnTheFly CT opens up new areas of application with strict measurement time requirements at a defined data quality.
	
	• The high speed does not influence the specifications according to VDI/VDE.
		
		Measuring an inhaler: measurement time for start-stop and OnTheFly methods
		
		"Tomography options" dialog

Computed Tomography (Option)	**Automatic Workpiece Changer – More Flexible Than Ever** The workpiece changing system (patent pending) transports different or identical workpieces in sequence from a pallet inside the machine into the measurement area, then removes them again afterward. Therefore the machine can also be used in "manless" night shifts or over the weekend. • The changing system is now available for the TomoScope® S in addition to the TomoScope® L and XL. • Several types of gripper are available for different workpiece carriers. • The new loop function allows fast and easy programming.	 *Full pallet with workpiece carriers*
Computed Tomography (Option)	**7-Axis Joystick Control** Either the height of the rotary table or the height of X-ray tube and detector can be adjusted. • In order to position workpieces optimally in the beam path for inspection tasks, the 7-axis control via joystick allows independent adjustment of the X-ray tube, detector, rotary table, and rotary axis.	
Computed Tomography (Option)	**Flexible Image Presentation** In the standard display on the monitor, the X-axis points to the right. • The orientation can optionally be changed so that it corresponds to the clamping position of the workpiece.	 *Standard IP display (left), representation of the workpiece as clamped in the measuring machine (right)*

Computed Tomography (Option)	**Flexible Focal Point Size**
	The focus size (focal spot size) depends on the tube type and the selected power.	
	• The focal point size can now be manually or automatically adapted to the current requirements.	
	• Two focus modes can be used - "Minimum" chooses the smallest possible focal point for all magnifications. - "Automatic" optimizes the focal point size for each individual magnification and the X-ray beam may be defocused to protect the target.	
	• The focal point size setting is displayed and compared with the optimal focal point size in TeachEdit mode.	
Computed Tomography (Option)	**New 2D Functions for X-Ray Inspection Tasks**
	Inspection tasks such as void analysis or inspection of the situation in an assembly can be performed directly on the X-ray images without measurement.	
	Local Contrast Optimization	
	• For workpieces that are difficult to penetrate with radiation, assemblies with large differences in density, or measured objects with a high aspect ratio, local contrasts often cannot be shown with sufficient differentiation in the radiographic image.	
	• Local Contrast Optimization allows both increasing contrast and suppressing noise in the images.	
	Histogram Display	
	• Any region within the radiographic image can be selected and the optimal contrast for a specific application can be set for each.	
	• For multi-material assemblies, the contrast can be optimized especially for one material. Using the histogram, the signal-to-noise ratio can then be optimized for inspection tasks or CT measurements.	
	Optimal Image Quality	
	• Software option available for measuring single images to be used. This function makes it possible to skip images at the beginning of a rotary increment in order to reduce effects such as vibration of the workpiece due to machine axis movements (acceleration/deceleration).	
	• The "Optimal Image Quality" option makes it possible to optimize image quality and leads to reduced measurement uncertainty for unstable workpieces.	

Radiographic image with low contrast (top) and after local contrast optimization (bottom)

Computed Tomography (Option)	**Volume Patch Selection** For example, geometry elements can be determined CAD-supported from an already calculated point cloud. • With a new function it is now also possible to calculate CAD based measuring points only for partial areas from the voxel volume. • Advantages: Lower calculation time and even "more local" edge detection. • The surface points, particularly for small features or for multi-material workpieces, are determined more securely and accurately.	

Notes

Release Information WinWerth 8.41
New Features