

Inspect the invisible in just one step

The new level of simplicity: ZEISS METROTOM 1



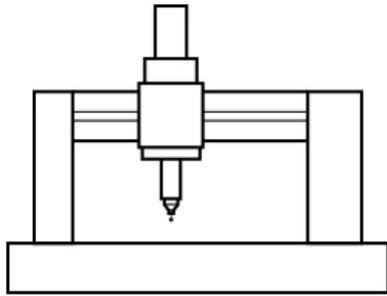
Metrology requirements

Fast, complete, repeatable and accurate 3D data

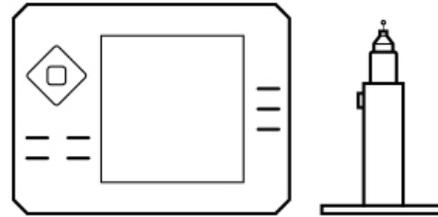


Metrology technologies

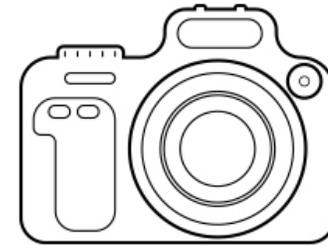
Don't be limited by your metrology device



CMM



Ultrasonic

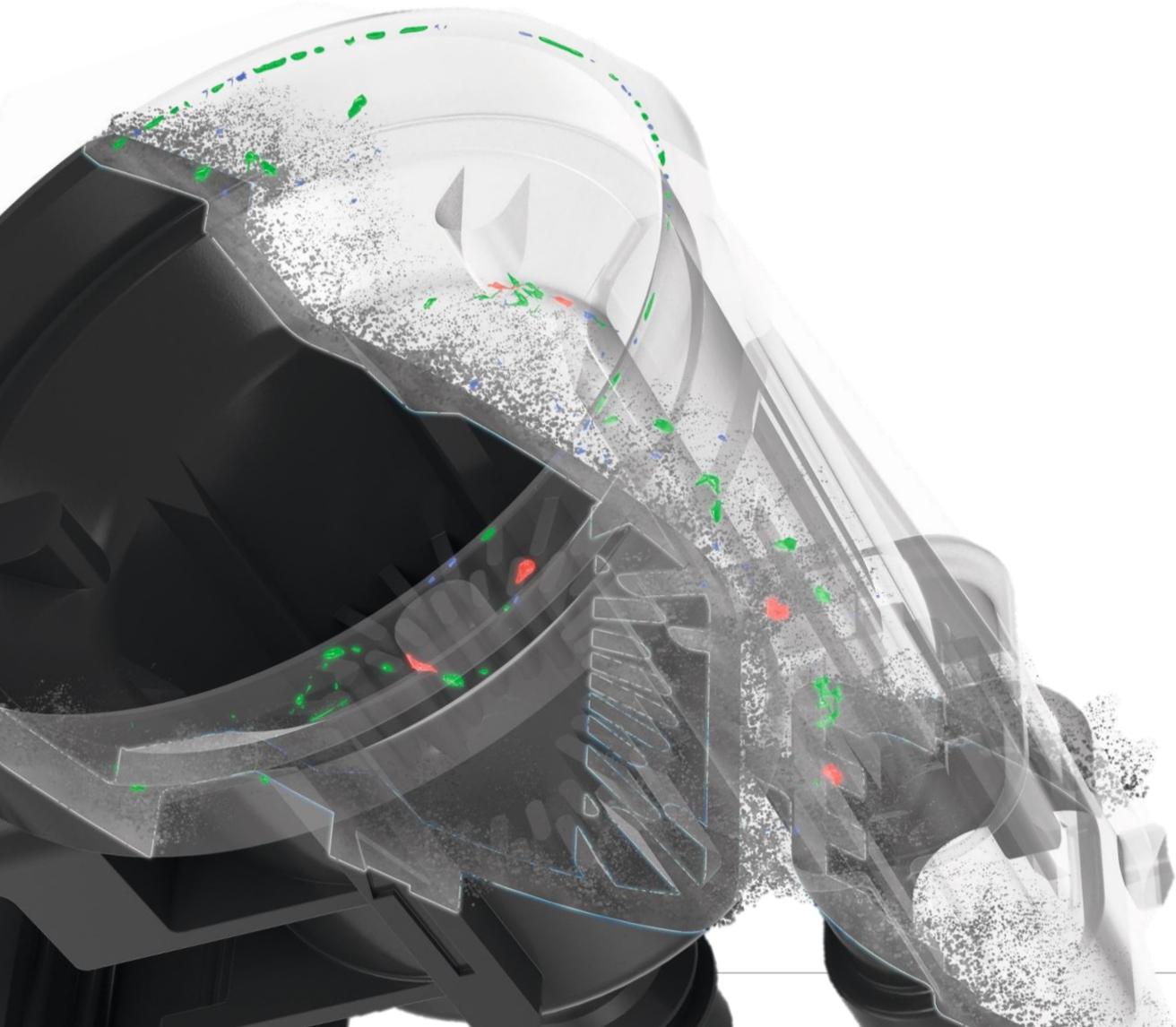


Optical

Do they meet your needs – time, fixturing, completeness, accuracy?

Computed tomography

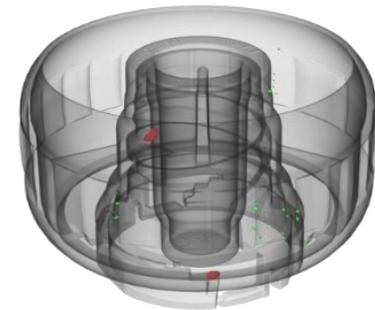
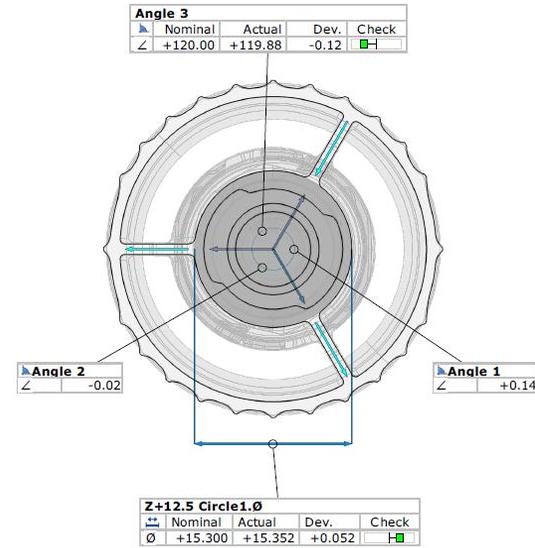
A technology with benefits



- One scan – full certainty: Measure, analyze, and inspect hidden defects and inner structures that cannot be detected with coordinate measuring machines.
- Thanks to X-ray, you can cut parts non-destructively and look inside!
- No more complex fixturing. This saves time and money!
- By scanning all internal and external structures with computed tomography systems (CT), parts can be reproduced even if no CAD model is available.

Discover all dimensions of your parts

And even the hidden ones



ZEISS METROTOM 1

All benefits at a glance



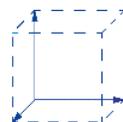
Smart design

Required space less than 1.6 m²



Low maintenance

Closed X-ray tube



Measure & inspect small to mid-sized plastic parts

With a measuring volume up to 165 x 140 mm



Easiest operation

Acquisition and evaluation by pushing one button



Trusted metrology results

Active temperature balancing and user calibration



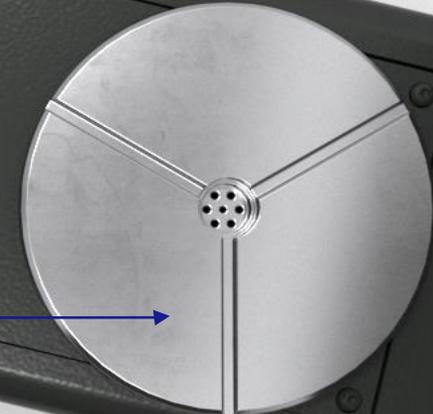
Powerful X-ray source

160 kV
600 W
Filter wheel



Detector

2560 x 2560 pixels
In-house development



Temperature controlled cabinet

Fully protected and secure
air conditioning
MPE (SD) 5 μ m +L/100

Measurement volume

D 165 mm
H 140 mm
Parts up to 5 kg



APPLICATIONS

Applications

One device, several use cases



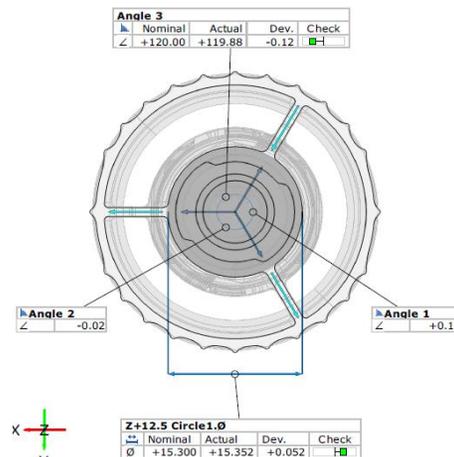


Highest throughput – maximum outcome

Multi-part scans



- High part quantities with optimal use of the measuring volume possible
- Automated separation and evaluation

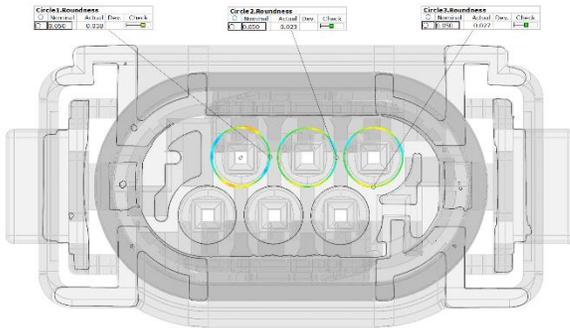


Facing bigger parts?

Single-part scans



- Fast scanning times according to your needs
- Scan the next part while evaluating the previous one

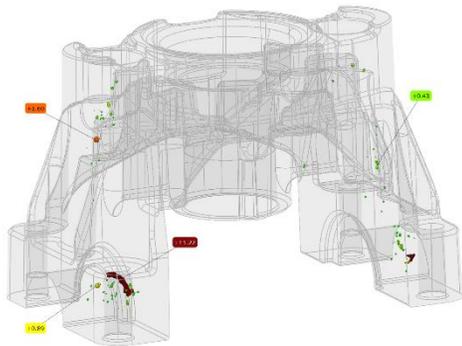


Powerful and versatile

Denser parts made of light metal



- The powerful X-ray source is able to penetrate denser parts like aluminum, titanium and ceramics
- Adjustable resolution to speed up the scanning time



EASY TO USE

Easy operation is essential for efficient processes

ZEISS METROTOM 1 & GOM Volume Inspect



- ZEISS METROTOM 1 is designed for shop-floor use and for shop-floor users.
- This includes:
 - All in one software solution
 - Intuitive UI
 - Automated Parameter Determination
 - Digitally set measurement volume
- The easy system operation allows usage by various operators from R&D to shop-floor and thereby creates a new kind of flexibility.



Software: GOM Volume Inspect

One stop solution



All in one software

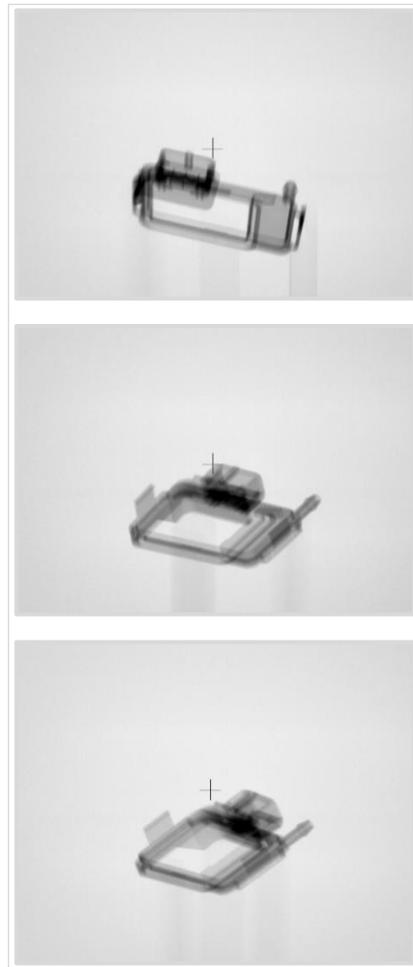
One software from calibration to report generation – and anything in-between



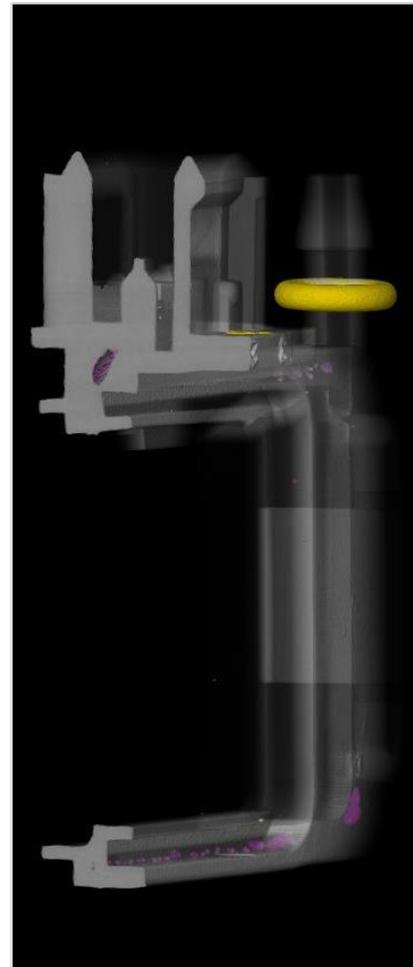
Calibration



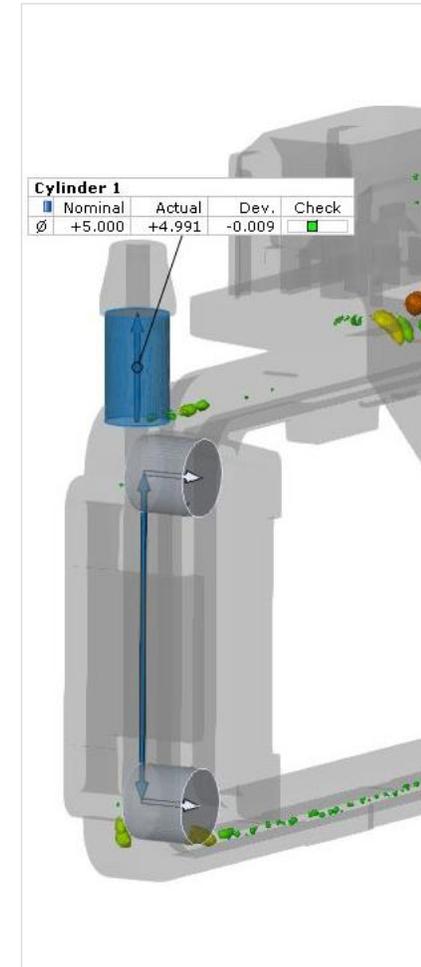
Measurement



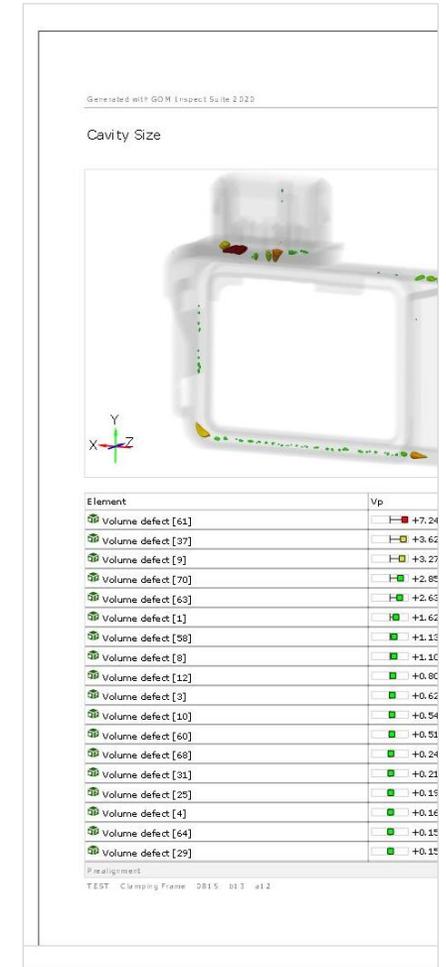
Volume Visualization



Inspection



Reporting

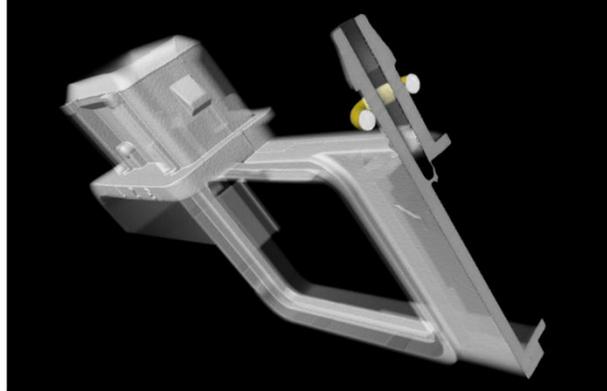


Powerful functionality

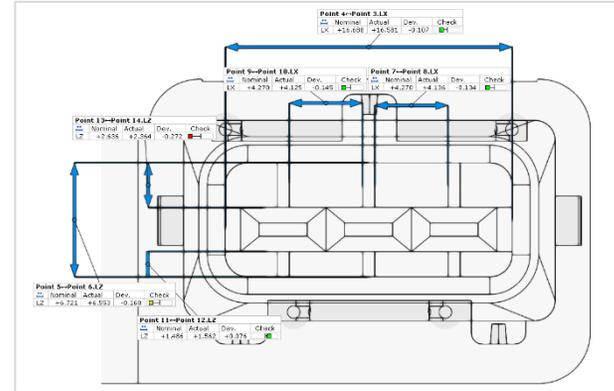
Volume visualization and inspection



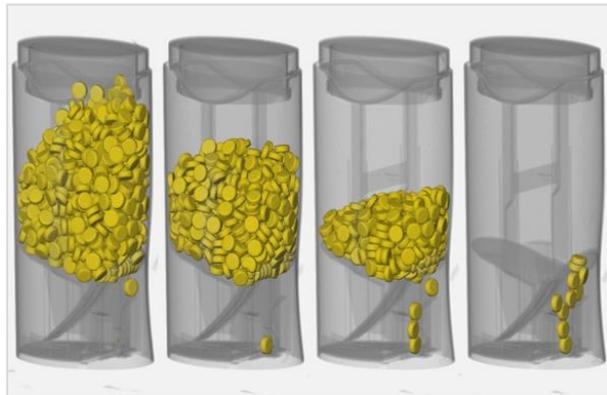
Volume visualization



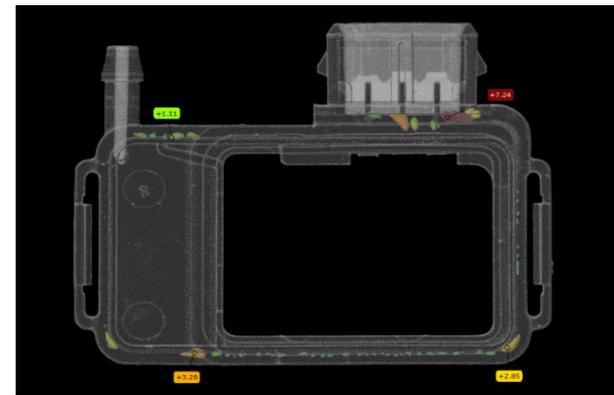
Dimensional metrology



Trend analyses and comparisons



Defect detection and inspection



User interface

The software leads the operator step by step through the measurement process



User-guiding
toolbar

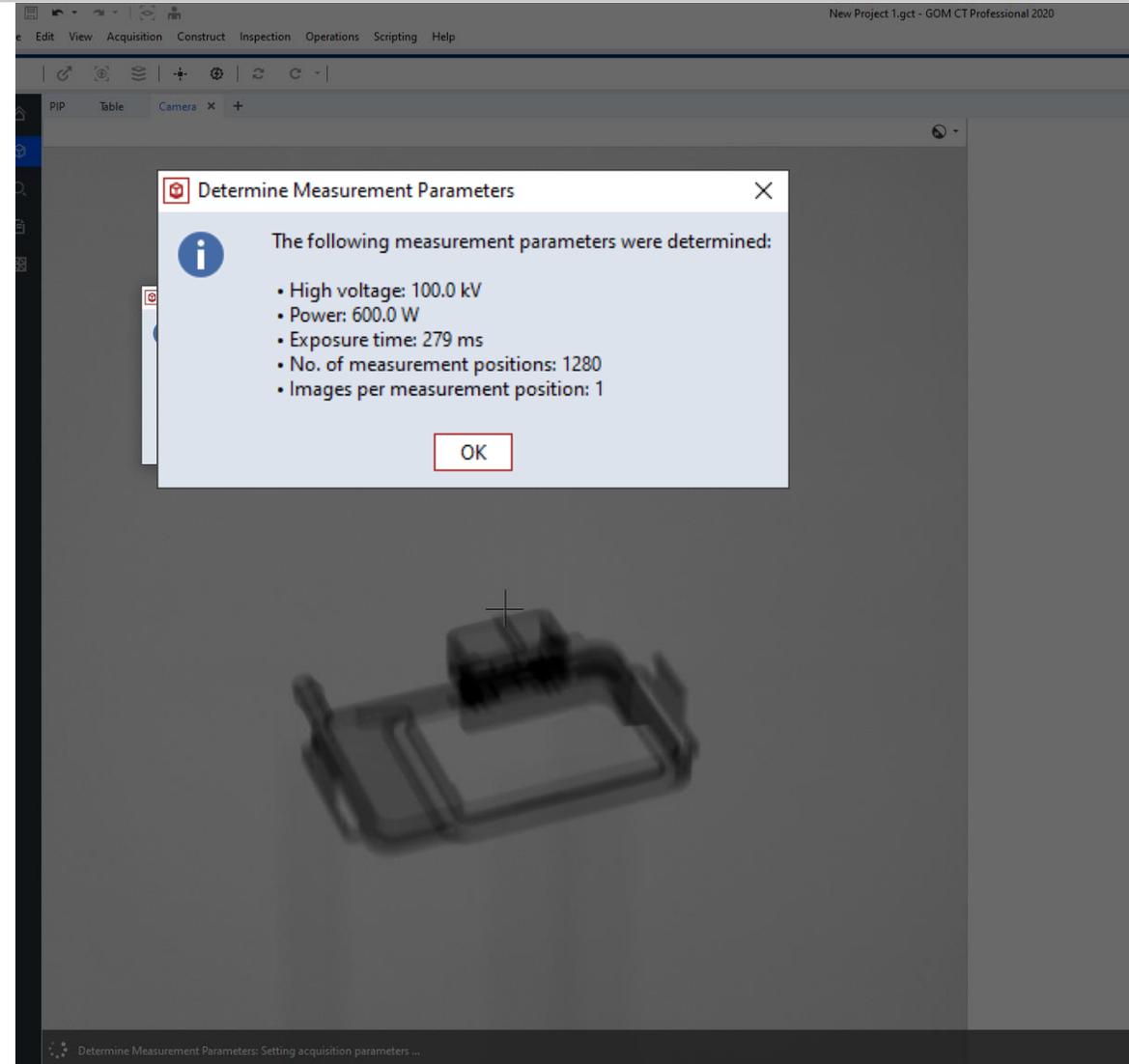


Automated parameter determination

To set up a scan



- Some of the most important measurement parameters for a CT are:
 - Voltage
 - Power
 - Exposure time
 - Number of steps
- ZEISS METROTOM 1 comes with an automated parameter determination for these values.
- The software provides the operator optimal starting values, thereby reducing the complexity of the CT technology

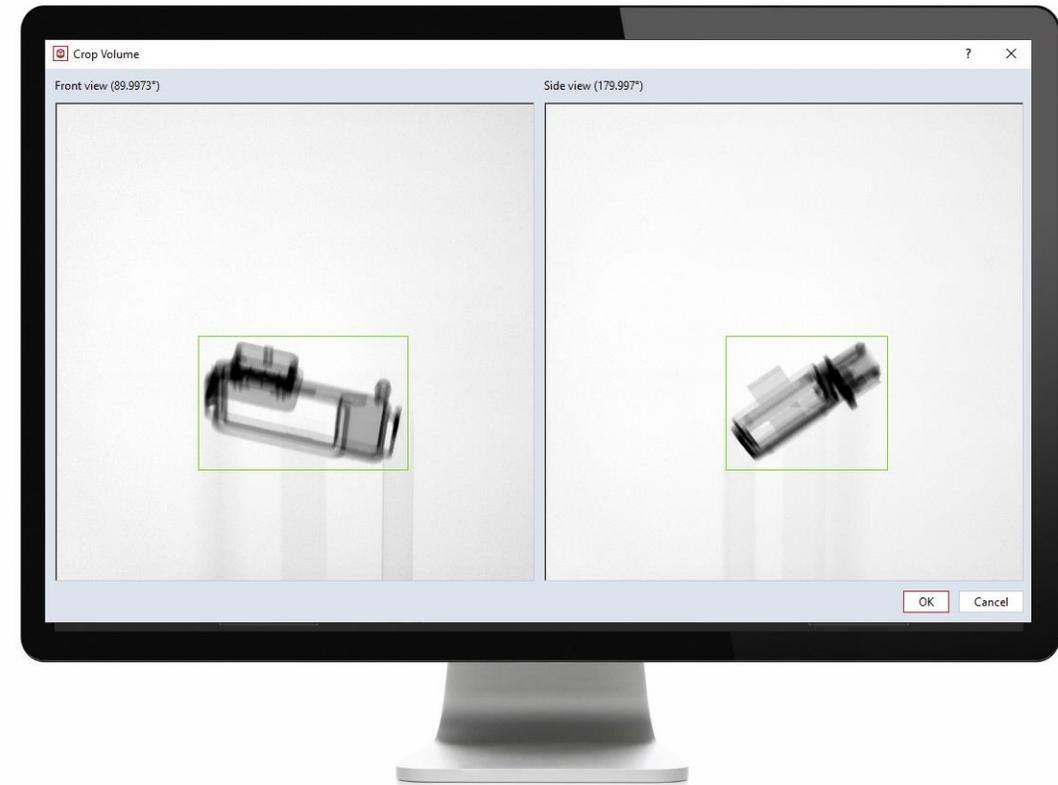
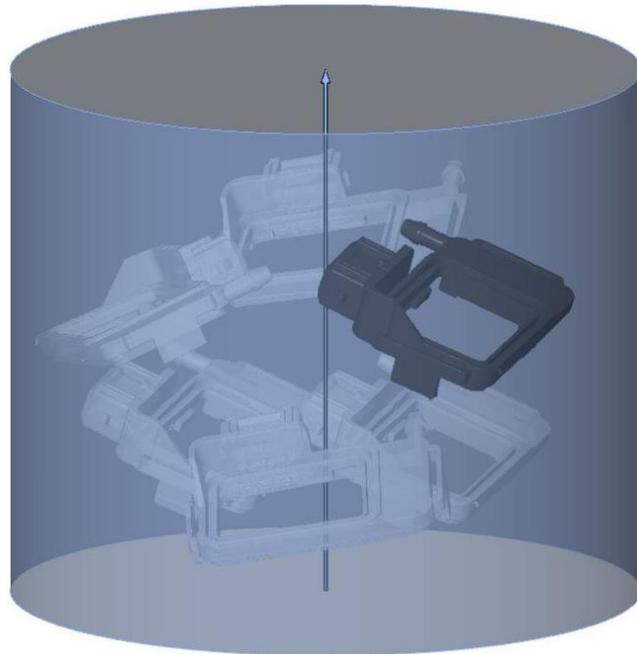


Digitally set the measurement volume

GOM Volume Inspect



- Easily measure anything within a measurement volume of 165 x 140 mm.
- The measurement volume fine-tuning is done digitally in a simple way.

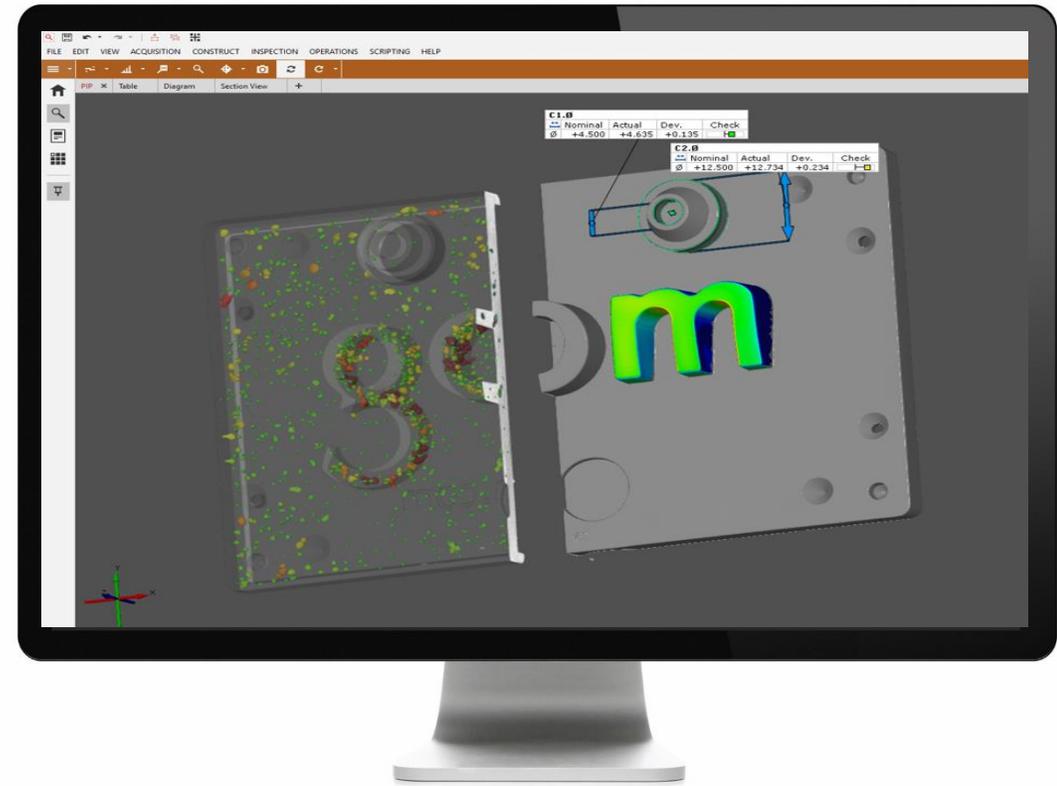


Unique solution

GOM Volume Inspect



- Combination of hardware and software creates continuous workflow and unique solution.
- Huge scope of evaluation functionality
→ from volume visualization over GD&T to reporting
- Free version available with 95% of the functionality
→ easily pass on complete projects to colleagues or customers
- The software can be automated and customized
→ use templates, user defined checks and the Python API to create individual functionalities and automated processes



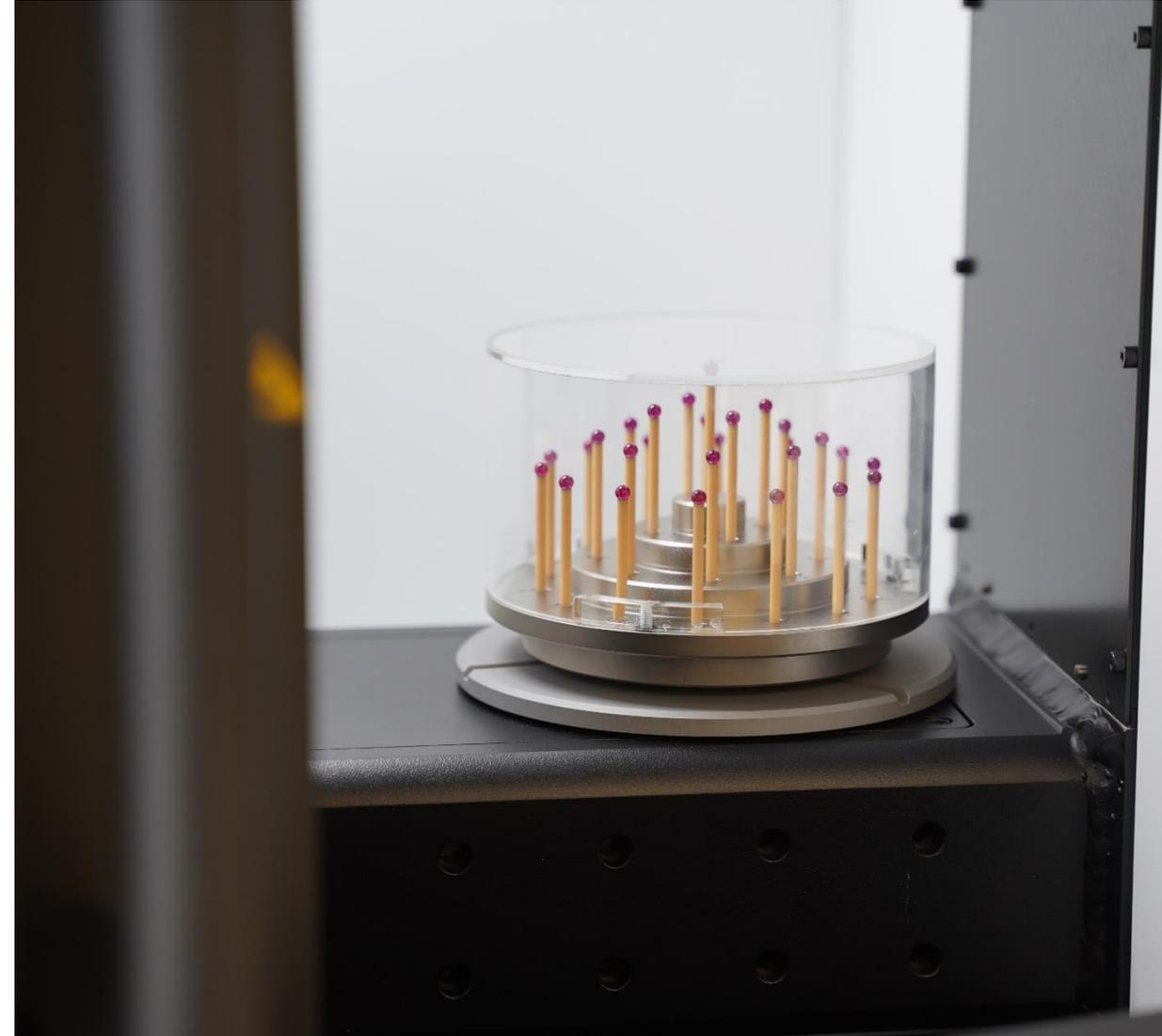
ACCURATE

Measurement results you can trust

With a highly accurate measurement system



- Every ZEISS METOROTOM 1 will be checked for accuracy – already during production and additionally after the on-site installation.
- The accuracy check is done using a calibrated and DAkkS certified acceptance artifact containing 35 individual distances.
- Accuracy limits of the ZEISS METOROTOM 1:
MPE (SD): $5 \mu\text{m} + L/100$ (preliminary value)

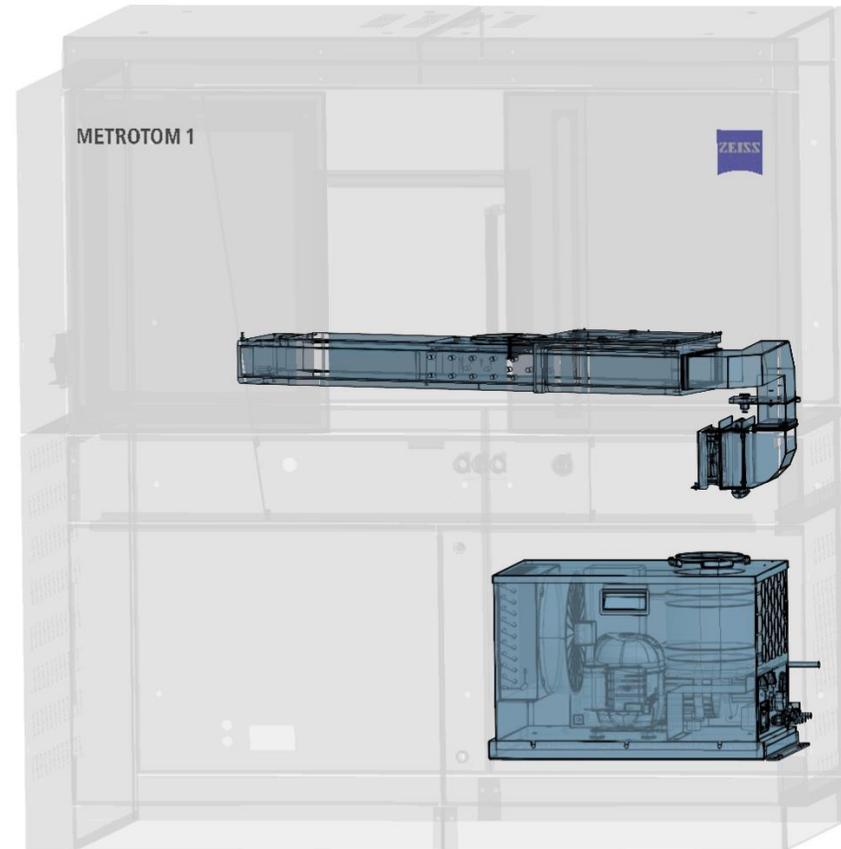


Keep things steady

Active temperature balancing



- Every electronic component produces heat.
- Changing temperatures will lead to geometric deformation – on the measurement sample as well as on the measurement system.
- To eliminate temperature changes, ZEISS METROTOM 1 comes with an active cooling system as standard.
- The system is tracking the outside temperature and automatically adjusts the system temperature on the inside accordingly.

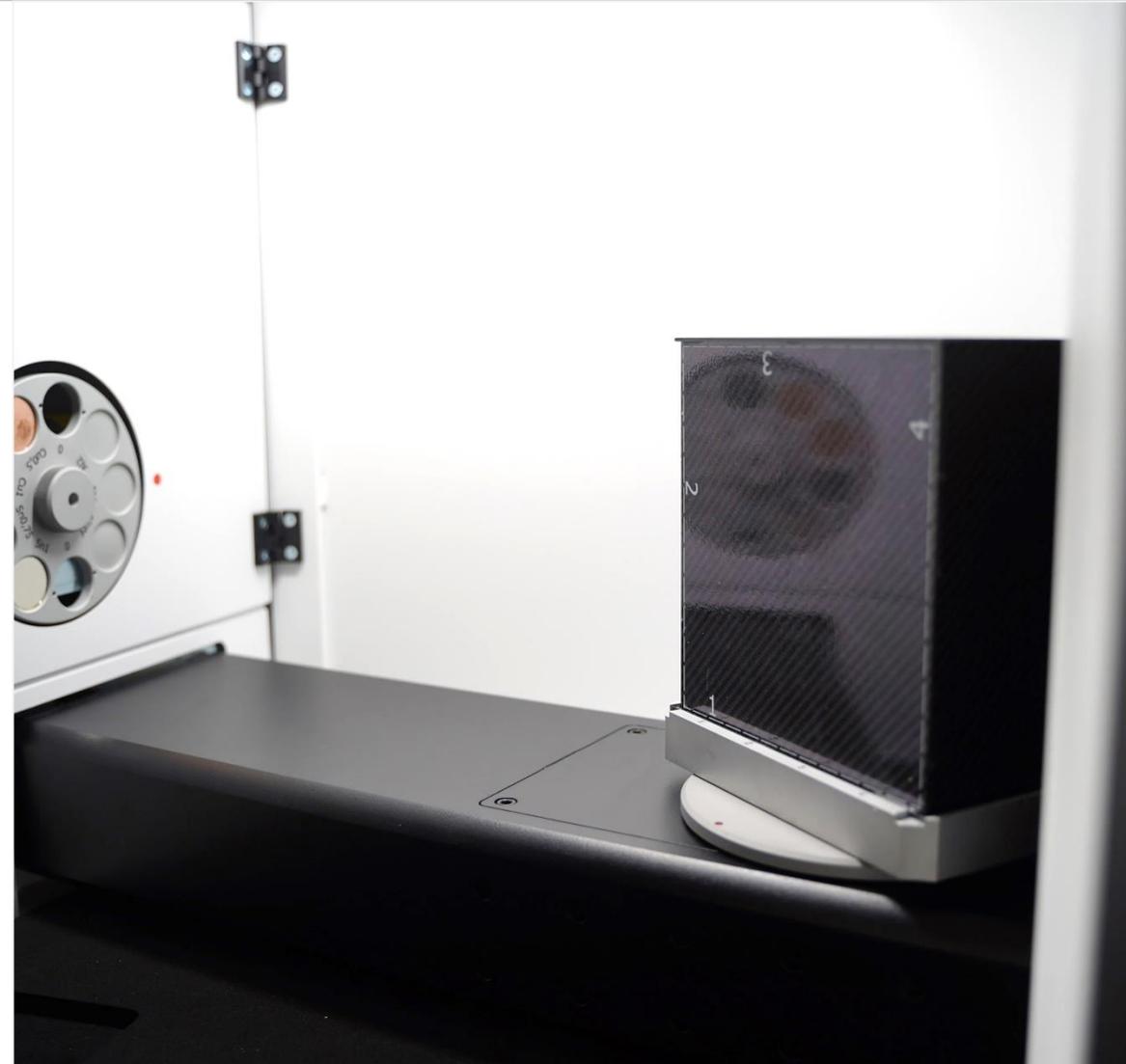


Always prepared

Easy calibration



- Geometrical deformation, caused by temperature changes or mechanical actions will lead to a decalibration of a CT system.
- ZEISS METROTOM 1 can be recalibrated by the operators themselves in less than one hour.
- The required calibration object is included in the standard ZEISS METROTOM 1 package.
- The operator calibration increases the up-time of the system and makes cost and time-consuming on-site service redundant.



TECHNICAL DATA

ZEISS METROTOM 1 package

No need for configurations – the package contains everything you need



Calibration object

For a recalibration of the system anytime by the operator – no on-site service required.

Active temperature control

To make sure system and part are always at the same stable temperature.

Continuous scan mode

A continuous rotation of the part will improve measurement times significantly.

Operation station

The packages contains a powerful PC for system operation, reconstruction and inspection.

GOM Volume Inspect Pro

A continuous software from measurement to inspection reports. Including the complete inspection functionality.

2.5k detector

ZEISS METROTOM 1 comes with a 2.5k x 2.5k detector.

160 kV X-ray source

For measurements of plastic parts and light weight metals.

ZEISS METROTOM 1

Specifications



Technical Data	METROTOM 1
Installation area	1.74 m x 0.87 m (without measuring PC)
X-ray tube	160 kV, 600 W
Voxel size	65 µm
Detector	2560 x 2560 (2,5k)
Accuracy	MPE (SD) 5µm + L / 100
Min. ceiling height	2.20 m
Recommended ceiling height	2.50 m
Needed space front side	Min. 1.50 m
Needed space left and right side	Min. 0.85 m
Needed space back side	Min. 0.1 m
Machine weight	approx. 2100 kg distributed over four feet
Point load per foot	approx. 575 kg
Feet	4x Ø 80 mm
Power supply 3 phase	Adjustable 220 – 484 V
Power consumption	6 kVA
Energy demand	4 kWh



ZEISS METROTOM 1

Specifications



Technical Data	METROTOM 1
Storage temperature	+5 °C to +40 °C
Operating temperature	+15 °C to +30 °C
Voltage range	200 V to 230 V, 32 A 340 V to 370 V, 16 A 371 V to 418 V, 16 A 374 V to 394 V, 16 A 419 V to 450 V, 16 A 451 V to 500 V, 16 A 50/60 Hz 3-phase
Power consumption (average/max.)	1-2 kVA / approx. 6 kVA
PC power supply	100 – 240 V, 50/60 Hz, 1-phase
PC power consumption (average/max.)	approx. 220 W / 440 W
Acceptable voltage fluctuation	5 %
Humidity	10 % to 55 % (non-condensing)
Noise level	typically 60 dB, max. < 70 dB
Max. size of measuring object	diameter = 170 mm, height = 150 mm
Max. weight of measuring object	5 kg



High Resolution Mode

ZEISS METROTOM 1 High Resolution Mode

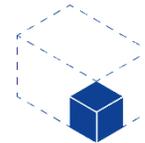
Benefits at a glance



High Resolution (HR) mode reduces voxel size from **65.3 μm** to **32.6 μm** .



Spot even small details and avoid unnoticed defects



Improved image quality



Easy switch between Standard and High Resolution mode

ZEISS METROTOM 1 High Resolution Mode

Comparison Standard vs. High Resolution



Features	ZEISS METROTOM 1 Standard	ZEISS METROTOM 1 High Resolution
Voxel size	65.3 μm	32.6 μm
Measuring volume	165 x 140 mm	80 x 80 mm
Pixel size	78 μm x 78 μm	39 μm x 39 μm



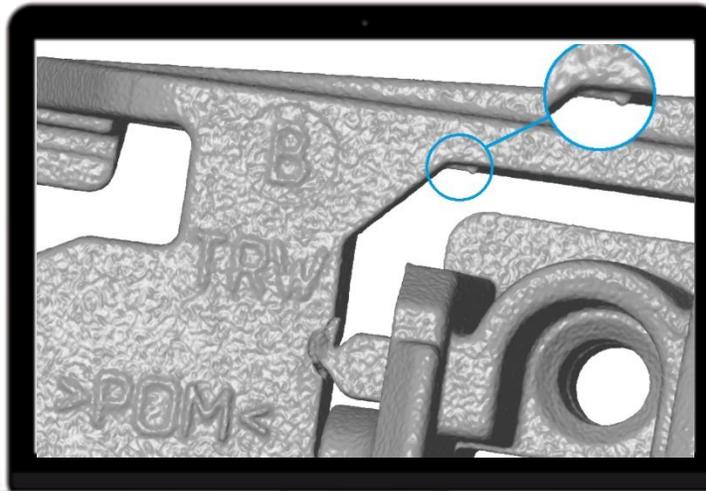
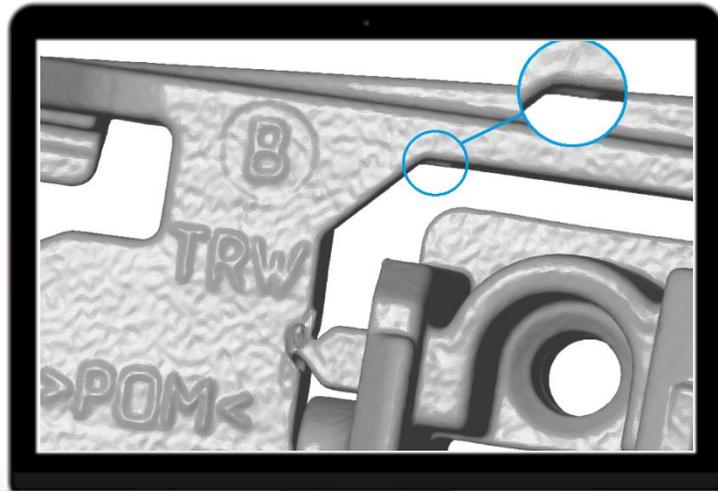
ZEISS METROTOM 1 High Resolution Mode

Application example seat buckle



Standard

High Resolution



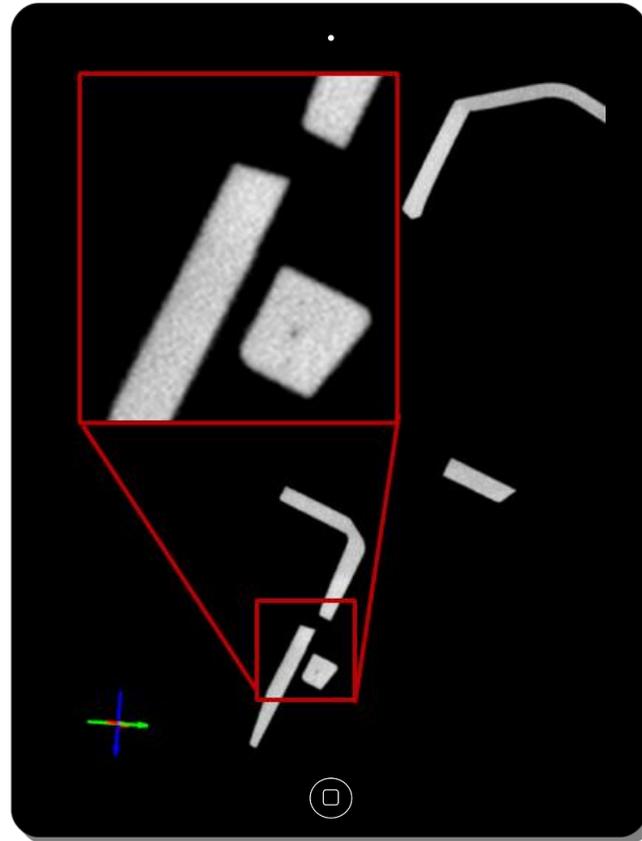
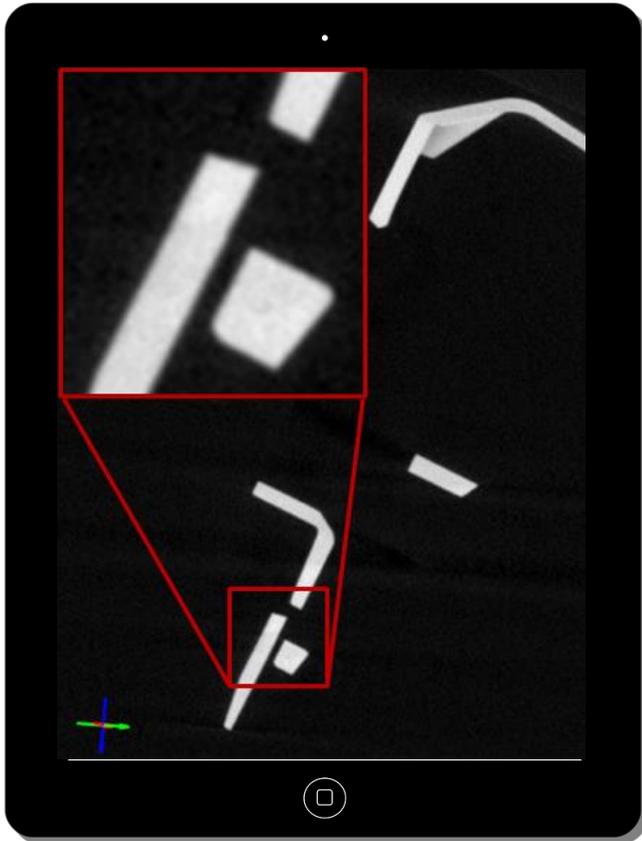
ZEISS METROTOM 1 High Resolution Mode

Application example seat buckle



Standard

High Resolution





ZEISS X-Ray Series



SYSTEMS

2D radiography
Computed tomography
X-ray microscopy

SOFTWARE



Image Acquisition
Image Evaluation
Data Management & Industry 4.0

ZEISS X-Ray Series Make the Invisible Visible

APPLICATIONS



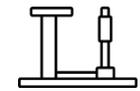
Additive manufacturing	Plastic parts
Alu casting	Composites
Battery	Multi-material parts
Blade	Assemblies
Electronics	Material research
Oil & Gas	Life sciences

SERVICES



Measuring services	On-site trainings	Local maintenance offerings
Application support	Classroom seminars	Guaranteed uptime
	eLearning	Spare parts packages

ACCESSORIES



Sample holders	Retrofit solutions
Set-up table	Automization solutions



ZEISS X-ray systems at a glance

Grow with your needs



HIGH-PRECISION METROLOGY & INSPECTION

METROTOM 1 (HR)
 METROTOM 800 130 kV
 METROTOM 6 scout
 METROTOM 800 225 kV (HR)
 METROTOM 1500

VoluMax 400
 VoluMax 800 130 kV
 VoluMax 800 225 kV
 VoluMax F1500
 VoluMax F1500 thunder
 VoluMax 9 flash
 VoluMax 9 titan

FAST & AUTOMATED 3D INSPECTION & METROLOGY



LAB INSPECTION, METROLOGY & ANALYSIS



HIGH-RESOLUTION ANALYSIS & INSPECTION

Xradia 810 & 825 Synchrotron
 Xradia 800 & 810 Ultra
 Xradia 610 & 620 Versa
 Xradia 510 Versa
 Xradia 410 Versa
 Xradia Context microCT

BOSELLO WRE thunder
 BOSELLO OMNIA
 BOSELLO MAX
 BOSELLO HEX

FAST & AUTOMATED 2D INSPECTION



PRODUCTION LINE INSPECTION & METROLOGY



Seeing beyond