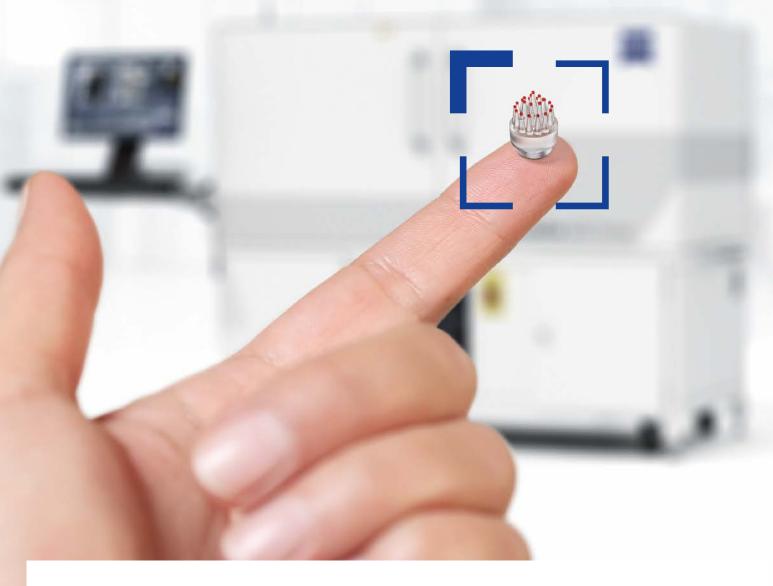
Adding measurement accuracy to X-ray microscopy.



Metrology Extension for ZEISS Xradia Versa



Seeing beyond

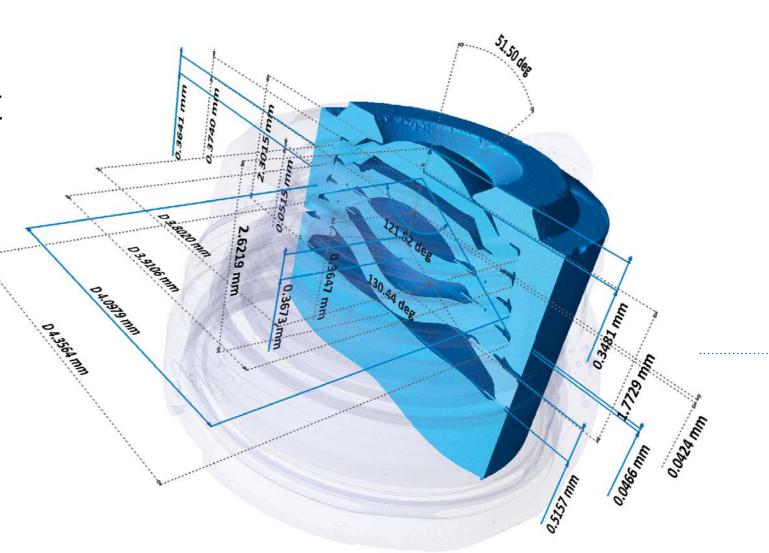
Reveal smallest dimensions.

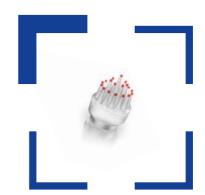
Measure them most

accurately.

Miniaturization and integration of components drive growing demand for high-resolution metrology. ZEISS introduced an entirely new realm of non-destructive insights into submicron details with Xradia Versa X-ray microscopes. Now, with **Metrology Extension for your ZEISS Xradia 620/520 Versa,** you can add measurement with an accuracy far beyond the limits of conventional CT technology.

Benefit from high-resolution X-ray imaging combined with high-precision metrology. Get verified measurement accuracy of small dimensions in reconstructed volumes of less than 125 mm³.













Small volumes at high resolution

Unlike conventional Micro-CT solutions, ZEISS Xradia Versa provides high-resolution imaging of small volumes inside larger samples, even when performing in-situ and 4D investigations. The MTX package compliments this offering by enabling measurements at high dimensional accuracy within small reconstructed volumes of 125 mm³.

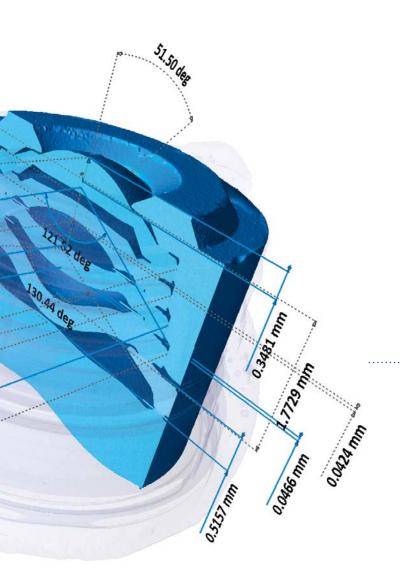
Simple calibration workflow

The MTX package provides an integrated user-guided calibration workflow, turning the resolution capability of your Versa system into verified measurement accuracy. Once the calibration routine has been executed, you can perform precise measurements and make the data available to standard metrology software for further processing.

Leading CT metrology accuracy

Calibrated with MTX, ZEISS Xradia Versa systems provide a market-leading maximum permissible error (MPE) value of $MPE_{SD} = (1.9 + L/100) \mu m$ for measurements in small-scale volumes, where L is the measured length in mm, opening new fields of application with the need for high-precision metrology performance in manufacturing and research.







Move the limits of your applications.

Deliver traceable results.

Smartphone camera lens assembly

In the assembled state of smartphone camera lens modules, the assessment of geometrical properties requires a non-contact and non-destructive measurement method to quantify relational parameters. Metrology Extension for ZEISS Xradia Versa allows the accuracy-verified measurement of properties like

- thickness of annular wedges,
- centration interlock diameters,
- gaps between wedges,
- lens-to-lens tilt,
- apex heights and centration,

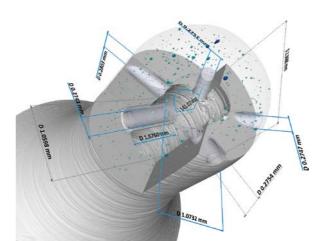
which are important for functional inspection and the enhancement of manufacturing designs and processes, to enable the production of versatile cameras with improved cell phone image quality.



Tip of a fuel injector nozzle

Since geometric features of injector nozzles influence engine performance, deviations from nominal nozzle design are typically measured for quality control.

X-ray CT is uniquely suited for non-destructive dimensional measurement.



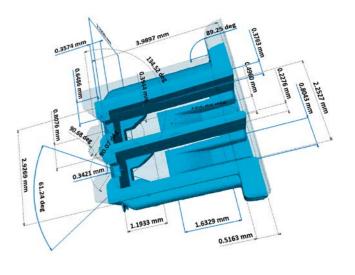
Now add high accuracy to your high resolution, high precision Versa systems.

- Perform high-resolution CT metrology with the best MPE specifications offered.
- Enhance confidence in your measurements needed for quality assurance.
- XRM Check phantom enables seamless calibration and accuracy verification.
- XRM Check developed in accordance with the VDI/VDE 2630-1.3 guideline.

XRM Check: ZEISS has developed a (multi-sphere) length standard for verifying the accuracy of the CT measurements of small-scale dimensions

Plastic injection-molded connector

Dimensional measurements of both internal and external structures of small plastic injection-molded parts or easy-to-deform components help to determine deviations from the nominal geometries specified in the computer-aided design (CAD).



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Specifications

ZEISS Metrology Extension for ZEISS Xradia 620/520 Versa

Accuracy (MPE complies with VDI/VDE part 1.3)

SD (TS) in µm	1.9 + L/100 ^(1,2)
Measuring range	Max measuring length: 4.8 mm ⁽³⁾
Software	
Operating Software	Scout-and-Scan Control System for ZEISS Xradia Versa
Operating System	Microsoft Windows 10
Further data processing	ZEISS CALYPSO
XRM Check	
Calibration standard	XRM Check used for determining sphere-center-distance (SD) errors as per VDI/VDE 2630 -1.3 guideline
Spheres	22 ruby spheres (grade 5) with 300 µm diameter
Sphere distances	Total of 35 different sphere distances measured along 5 different lengths in 7 different planes; Largest distance measurement of 3.6 mm
Supporting structure	Made of fused silica (coefficient of thermal expansion $\approx 0.55 \times 10^{-6}/K$)
Calibration uncertainty	Reference calibration data with an uncertainty of U $(k=2) < 0.150 \mu m$.
-	-

Availability

New system compatibility	ZEISS Xradia 620 Versa
Field upgrade compatibility	ZEISS Xradia 620 Versa
	ZEISS Xradia 520 Versa

¹ L is the measured length in mm

 $^{^{\}rm 2}$ Accuracy specifications valid for measurement in a single field of view on the 4X optical magnification

³ Samples could be longer than 4.8 mm as long as region of interest for CT reconstruction fits inside the field of view