

Advance the Limits of Submicron X-ray Imaging.



40x-Prime Objective from ZEISS

Enhance Resolution and Image Quality
On ZEISS Xradia 630 Versa

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Seeing beyond

40x-Prime Objective from ZEISS

Enhance Resolution and Image Quality

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Maintaining resolution on large, dense samples and maximizing throughput – two challenges you never thought could be addressed at the same time with an X-ray computed tomography technique? Imagine you could investigate samples of every size and even of larger densities with a non-destructive 3D X-ray microscope (XRM) – achieving resolution specifications like never before and without having to change the target of the X-ray source?

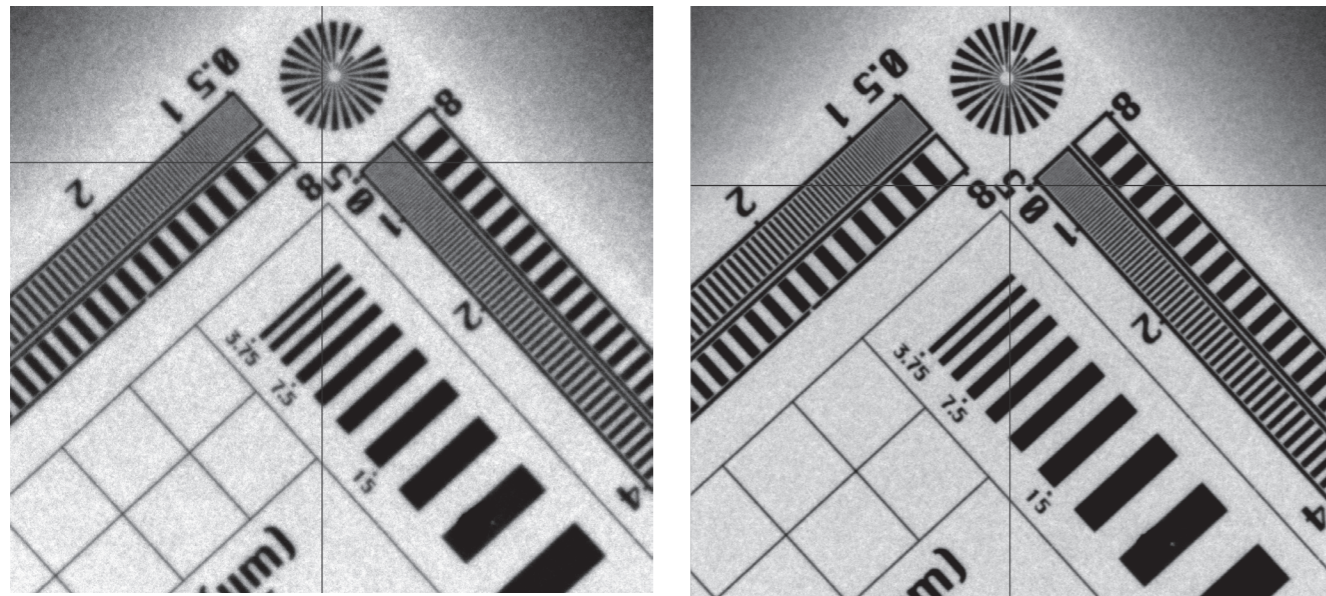
ZEISS Xradia 630 Versa XRM, with the higher energy sensitivity of the exclusive 40x-Prime objective, enables you to push the limits of submicron imaging like never before.

Highest resolution without compromise

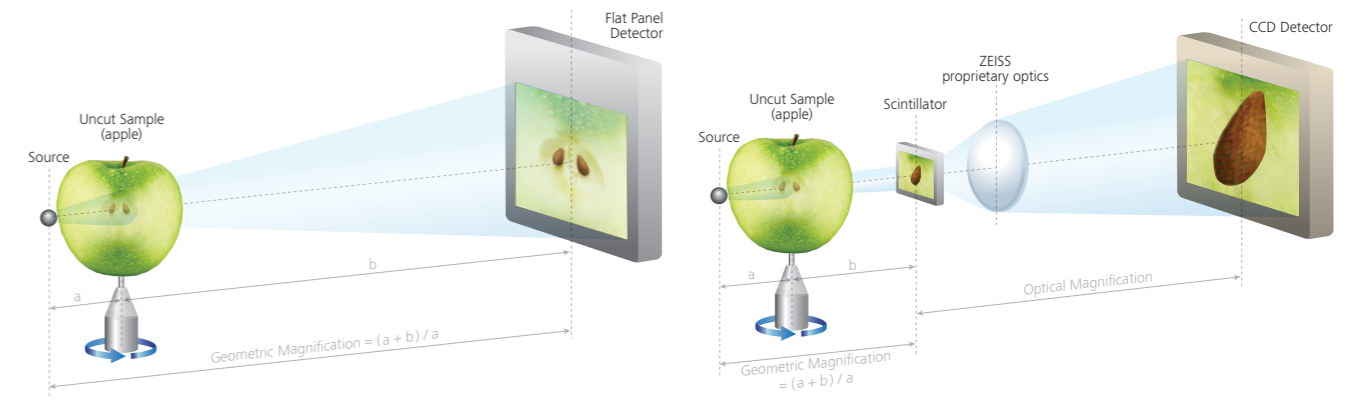
Known for their ability to achieve resolution at a distance (RaaD), ZEISS Xradia Versa XRM allows high resolution imaging of multiple sample types, sizes and ranges of length scales. With the new 40x-Prime objective, the system now achieves unparalleled resolution performance of up to 450 nm across the full range of X-ray energy, from 30 kV to 160 kV. All this defines RaaD 2.0 and unlocks entirely new application capabilities for researchers.

Your advantages in using the 40x-Prime objective are:

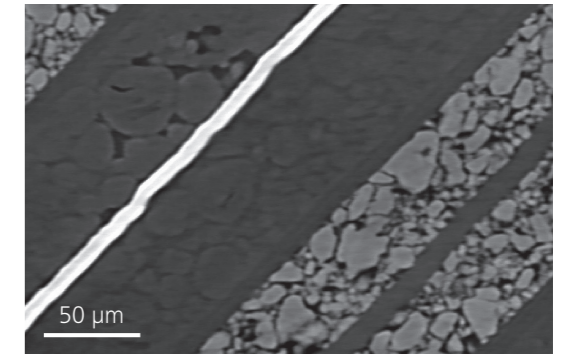
- Unparalleled spatial resolution, across the entire X-ray energy spectrum from 30 kV to 160 kV
- Improved image quality, voxel size and better contrast
- Performance defining resolution at a distance, RaaD 2.0.



High kV comparison of highest resolution capabilities at same kV for two objectives: 40x at 800 nm (left) and 40x-P at 500 nm (right), both at 120 kV with the low energy ZEISS LE6 filter (equivalent to 1.3 mm Al (aluminum)).



Comparison of microCT (top left) and RaaD (top right). Pouch cell battery revealing a sharper image, better contrast and a larger number of particles when imaged with the 40x-P (bottom right).



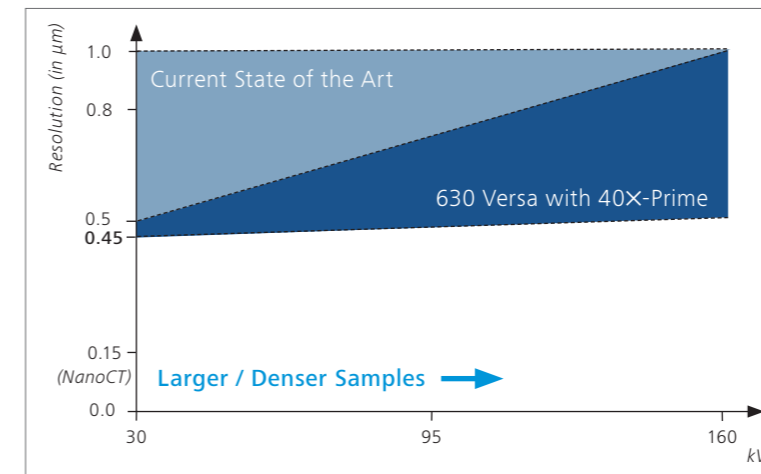
The two major challenges in X-ray computed tomography are maintaining resolution on larger sample sizes and longer working distances while simultaneously maximizing resolution and X-ray flux for greater throughput.

Addressing these challenges requires design optimization. ZEISS Xradia 600-series Versa uniquely meets these challenges by integrating dual-stage magnification architecture with high flux X-ray source technology. ZEISS specifies XRM on true spatial resolution, which is the most meaningful measurement of a microscope's performance. Spatial resolution refers to the minimum distance at which a feature pair can be resolved by an imaging system. It is typically measured by imaging a standardized resolution target.

ZEISS Xradia 630 Versa obtains spatial resolution of 450 nm, a 10% improvement over existing technologies, while achieving 500 nm resolution at 160 kV, expanding the RaaD application space to larger, denser samples.

The 40X-Prime objective enables dramatic performance gains:

- 450 nm resolution @ 30 kV
- 500 nm resolution @ 160 kV / LE 6 (Res. Performance)
- 700 nm resolution @ 50 mm (RaaD)



Resolution performance for X-ray microscope technologies plotted as achievable spatial resolution versus X-ray source voltage. Larger and denser samples generally require higher source voltages to achieve sufficient X-ray transmission.

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